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Chapter 1

Introduction and research questions

1 Introduction

Common beliefs about crime are characterized by two, seemingly contradictory ideas. One is captured in the saying 'once a thief, always a thief', and breathes continuity and determinism. The other is the widely held view that crime and deviance are part of the sins of people's youth – adolescents shedding their wild hairs and settling down as they grow up. This view stresses change rather than stability; offenders leaving their criminal behaviour behind as they age. Academic criminology provides support for both views (Robins, 1978). On the one hand those who are found offending in adulthood in most cases have juvenile records. On the other hand most juvenile offenders do not become adult offenders. The development of crime over the life course thus seems to be characterized by both stability *and* change (Paternoster, Dean, Piquero, Mazerolle, & Brame, 1997).

Within-individual variability in offending over time challenges many 'classical' criminological theories. Such classical theories offer explanations for between-individual differences in crime, as found in cross-sectional studies, and usually do not address within-individual change in criminal behaviour over time (Farrington, 2003). Some criminologists have questioned whether a single causal mechanism can explain both between-individual differences as well as within-individual differences in offending. These researchers plead for a developmental approach to crime, distinguishing several dimensions in criminal behaviour over time and allowing these dimensions to be influenced by different causal factors (Blumstein, Cohen, Roth, & Visher, 1986). As they argue, different theoretical explanations may be needed to explain why an individual starts committing offences, the frequency with which he offends, and the length of the period he is criminally active.

Notions of stability and change in offending are of paramount importance to policy makers as can be illustrated by adopting either one of the points of view found in the public conception. If offending were highly stable over time, it would pay to identify those offenders who offend at a high rate and make them the focus of judicial attention. Primary concern would then be to reduce the number of crimes committed by these active offenders, for instance by means of incarceration. If criminal development however, would be characterized by variability instead – for instance all offenders abandoning crime as they enter adulthood – the benefits of identifying frequent offenders would be much less, since by the time offenders could be identified as frequent offenders, the frequency of their offending would already have started to decline. In case of extreme variability, preventing individuals from becoming active offenders would yield the most benefits. As such, knowledge about the development within individuals over time as well as about differences between individuals herein is highly relevant from a policy point of view.

Since factors related to between-individual differences may differ from factors related to within-individual change (Farrington, Loeber, Yin, & Anderson, 2002), explanations for the development of criminal behaviour over the individual's life course, by definition, cannot be derived from cross-sectional studies. Instead, longitudinal studies (prospectively) following the same individuals for an extended period are needed as they allow for a within-person comparison over time (Sampson & Laub, 1995). In addition, longitudinal data needs to be collected and analyzed in ways that, besides accounting for stable individual background factors, allow for the quantitative measurement of the changing nature of offending as well as the timing, duration and ordering of important explanatory variables (Sampson & Laub, 1992).

The developmental approach towards crime has become increasingly popular during the last two decades (Benson, 2002; Farrington, 2003). Many longitudinal studies have been initiated (for an overview see: Piquero, Farrington, & Blumstein, 2003). While these studies have greatly advanced knowledge on the various developmental aspects of criminal behavior, many questions still remain to be answered. Especially, given that many longitudinal studies focus on adolescence and only cover a limited period of the entire life span, little is known about crime in middle and late adulthood (Laub & Sampson, 2003; Sampson & Laub, 1992). How much crime is there in later life? Do older offenders commit the same types of crime as when they were young? Do frequent adolescent offenders continue to offend at a high level, or does their offending rate decline as they age? When does the average offender stop offending? Do factors that influence the start of offending also affect its frequency and duration? Despite recent research efforts, these issues – that are at the heart of the developmental approach in criminology – have remained largely unresolved.

This is particularly true for Dutch criminology where empirical developmental approaches have been limited up till now (Bruinsma & Loeber, 2004). The initial skepticism with which the developmental approach was first received (Bunt, 1988; Kommer, 1988) has – as witness the many recent initiatives – made way for a growing interest (Donker, 2004; Hoffman et al., 2003; Ormel et al., 2001). Still – with some notable exceptions – most Dutch studies incorporating developmental aspects of crime are characterized by small samples and limited follow up periods (Wartna, 1999). Of the longitudinal studies that did follow offenders for an extended period of time, many used samples derived from very specific populations, for example those offenders who were ordered to be detained on a secure hospital order (Leuw, 1999).

Findings coming from the longitudinal studies fueled the need for theories explaining them. A number of new developmental theories have been formulated – and contested – and existing theories has been reformulated in developmental terms (Farrington, 2005; Thornberry, 1997). Developmental theories can be conceptually distinguished into static, dynamic, and typological theories, based on the relative importance of individual differences in explaining differences in development in crime over time and the formal relations that are allowed within each type of theory between past, present and future variables (Paternoster et al., 1997). Static theories attribute criminal behavior to an individual's stable propensity. These theories recognize that some people are more crime-prone than others, but deny exogenous influence on the development of criminal behavior after some point early in life. Dynamic theories on the other hand claim that the trajectory along which individual criminal behavior develops is to a large extent shaped by

external events a person experiences during his entire life course. Finally, typological theories refute the assumption shared by both static and dynamic theories, that one theory is sufficient to explain the behavioral development of all criminals. Instead, these theories propose different routes for different kinds of offenders, allowing the influential balance between internal propensity and external events in shaping the offender's behavior to shift between types. Rival hypotheses regarding the generality of the effect of age on crime, the effects of time-varying life circumstances, and the effects of prior offending on future offending can be derived from these theories. However, the lack of data on crime in later life leaves the empirical support for many of the long-term predictions made by these theories rather weak.

This thesis intends to advance what is known about the development of offending behavior over the individuals' life span. Because continuous issues in developmental criminology concern both empirical as well as theoretical questions particularly regarding the development of offending later in life, this thesis focuses on the period from early adolescence to late adulthood. Its two major aims are:

(1) describing the long-term development of criminal behavior over the life span in the Netherlands
(2) testing hypotheses derived from developmental criminological theories, regarding the effects of (a) age, (b) life circumstances, and (c) prior offending on that development.

To do so two large, nationally representative datasets are used, one containing information on the officially recorded criminal careers of over 5,000 registered offenders who were prosecuted in the Netherlands in 1977, the other containing retrospective self-reports on offending from a Dutch population sample. To test hypotheses derived from developmental theories with regard to the effects of age, life circumstances and prior offending on criminal behavior, data on stable individual features and time varying life circumstances were added to the criminal career data. The three theoretical perspectives on the development of criminal behavior expounded above will provide the necessary framework for addressing this second research question.

2 Theoretical background

Criminologists have always had a keen interest in the way offenders live and how crime shapes their daily routines. Many early studies – both qualitative (e.g., Klockars, 1974; Shaw, 1966; Sutherland, 1937) and quantitative (e.g., Glueck & Glueck, 1950; Powers & Witmer, 1951; Robins, 1966; Wolfgang, Figlio, & Sellin, 1972) – have now become classics in criminological literature. The latest upsurge in developmental studies however can be traced to the publication of the 1986 National Academy of Science report (Blumstein et al., 1986) and the heated debate surrounding it (Barnett, Blumstein, Cohen, & Farrington, 1992; Blumstein, Cohen, & Farrington, 1988a, 1988b; Gottfredson & Hirschi, 1986, 1988; Greenberg, 1991, 1992; Land, 1992). The National Academy's report defined the criminal career as the longitudinal sequence of crimes committed by an individual offender. It also laid down the basic conceptual tools and vocabulary, launching the con-

stellation of what by now goes by the name of Developmental and Life Course Criminology (DLC) firmly into the criminological firmament (Farrington, 2003).

Four important dimensions in individual offending are participation, frequency, crime-type mix and career duration (Blumstein et al., 1986; Piquero et al., 2003). The dimension 'participation' differentiates between those who at some time in their lives engage in crime and those who never engage in crime. Frequency refers to the number of offences an individual offender commits within a given period of time. Crime mix refers to the mix of different offence types among active offenders. The fourth dimension 'career duration', pertains to the total period an offender is criminally active; in other words the period between his or her first and last offence. The authors of the report stated that distinguishing several dimensions of criminal behavior is of theoretical importance because different dimensions are likely to be influenced by different factors (Barnett et al., 1992; Blumstein et al., 1988a; Blumstein et al., 1986). Others have added to the number of measurable dimensions a criminal career can be disaggregated in (LeBlanc & Loeber, 1998; Loeber & LeBlanc, 1990).

Contrary to 'classical' criminological theories, which primarily aim to explain why some turn to crime while others do not, the multidimensional approach to crime offered by the criminal career paradigm provides Developmental and Life course Criminology (DLC) with a dual focus. DLC concentrates on both between – as well as within-individual changes in criminal behavior over time (Farrington, 2003). Central to DLC is not only why some participate in crime, and others do not, but also *how*, and *why* the criminal behavior of active offenders changes over time.

Recent developmental criminological theories differ in the importance they attach to individual differences, as well as in the extent to which they regard change in individual behavior over time as problematic. Paternoster et al. (1997) provide a classification scheme in which theories can be grouped along these dimensions distinguishing *general static*, *general dynamic*, and *typological* theories. These three kinds of theories offer rival predictions regarding the above mentioned career dimensions. While general static theories ascribe individual differences in participation, frequency and career length to stable differences in criminal propensity, general dynamic theories stress the role of the individual's varying social circumstances in explaining change as well as continuity in crime. Finally, typological theories stress between-individual differences in their explanation of variability in both career characteristics and responsiveness to contextual clues.

2.1 General static theories

Static theories explain individual differences in criminal behavior from variation in an underlying factor commonly denoted as criminal propensity or criminal potential (Gottfredson & Hirschi, 1990; Rowe, 1996; Wilson & Herrnstein, 1985). The individual level of criminal propensity is usually assumed to result from some kind of interplay between dispositional and family influences. Gottfredson and Hirschi (1990) point to low self-control resulting from parents failing to monitor, recognize and adequately punish their child's deviant behavior as the major underlying factor leading to between-individual differences in the individual tendency to commit criminal acts. Wilson and Herrnstein (1985) take a cluster of enduring individual characteristics, such as impulsivity, poor conditionability and impaired conscience to underlie serious offending. Once formed in early childhood, criminal propensity is postulated to be a fairly stable characteristic.

Between-individual differences in criminal propensity are considered to influence all career dimensions in the same direction, therefore causing the distinction in several dimensions to be superfluous (Hirschi & Gottfredson, 1983) and resulting only in level differences in criminal behavior between individuals. A person highly prone towards crime – e.g., low in self-control – does not only have a higher chance to participate in crime, but is also likely to be more frequent and lengthy in his criminal behavior than someone less crime-prone. Cross-sectional data has shown crime to decline with age (Farrington, 1986; Junger-Tas, 1992). Static theories postulate that the shape of this age-crime curve results from age-graded differences in the frequency with which offenders commit their crimes and not from differences in participation between adolescents and adults (Hirschi & Gottfredson, 1983). Static theories regard this age-graded variation in frequency over the life course as universal and independent of the level of one's criminal propensity. Because of this, between-individual differences in offending are predicted to remain constant over time despite level differences in the frequency of offending behavior (Hirschi & Gottfredson, 1995). Furthermore, static theories state that the effect of age on crime is invariant across life circumstances. Increased opportunities to bond with conventional society, or changes in association patterns brought about by changes in life circumstances like work and marriage do not affect criminal involvement. Instead, the association between life circumstances and criminal behavior is thought to be spurious as they are both influenced by the same underlying propensity. Individuals with high criminal propensity are both most likely to commit crimes while at the same time least likely to hold steady jobs, to have stable marriages, or to take part in raising children. As Gottfredson and Hirschi (1995) put it, irregular work history and unsteady personal relationships are themselves within the realm of deviance. Static theories thus offer a 'kinds of people' explanation of between-individual differences in crime (Laub & Sampson, 2003).

2.2 General dynamic theories

General dynamic theories are 'general' in the sense that they deny that groups can be distinguished based on different and distinct causal processes. In this sense, they resemble static theories. Dynamic theories differ from static theories, however, in that they ascribe a causal effect to changes in life circumstances. Dynamic theories contribute desistance from crime to the crime-inhibiting potential of changes in the individual's social context. Sampson and Laub's age graded theory of informal social control is a prominent example of a dynamic theory (Laub & Sampson, 2003; Sampson & Laub, 1993). Sampson and Laub's theory states that having a job, getting married and becoming a parent all represent transitions in social roles that may generate turning points in an individual's criminal trajectory because these transitions recalibrate the balance between the short-term benefits of crime and the long-term yield of commitments to conformity (Sampson & Laub, 1990). In a similar vein, Warr (1998) has argued that marriage leads to changes in association patterns, married individuals being less exposed to delinquent peers as are single individuals. Dynamic theories view these life course transitions as, at least in part, exogenous events, that is, as occurring irrespective of an individual's criminal propensity: even individuals high on criminal propensity have a chance of getting married, and when they do, this will inhibit their criminal tendencies (Laub, Nagin, & Sampson, 1998). Dynamic theories thus predict that the relationship between life circumstances and crime holds, even when individual differences in propensity are taken into account. Because life

course transitions are seen as – partly – random events, dynamic theories also allow for a greater variation in patterns of desistance than do static theories.

Dynamic theories view the development of criminal behavior as open to change, but change does not always have to be for the better. Prior criminal behavior can influence either the perpetrator or his social environment in such a way that future criminal behavior becomes more likely. A weakened bond to conventional society may lead to crime, which in turn will lead to the offender becoming even more estranged. Sampson and Laub use the term 'cumulative disadvantage' to emphasize the negative aspect of this cumulative process of state dependence (Sampson & Laub, 1995, 1997).

While dynamic theories allow for patterns of desistance to differ between individuals, dynamic theories disagree with typological theories in that individual offenders can be meaningfully grouped based on their pattern of offending. According to dynamic theories the aggregated age-crime curve thus does not disguise different types of offenders showing distinct offending trajectories; rather it provides a trend-line that is distilled from the underlying individual variety surrounding the general tendency towards desistance (Laub & Sampson, 2003). This 'drift' towards desistance is thought to result from the increasing number of individuals that find themselves investing in conventional bonds as they age (Sampson & Laub, 2005). Dynamic theories are thus sociogenic theories that can be said to offer a 'kinds of contexts' explanation for differences in the development of criminal behavior over the life span (Laub & Sampson, 2003).

2.3 Typological theories

Typological theories emphasize qualitative individual differences between offenders. These theories assume that a large fraction of offenders is criminally active only during adolescence and only a small fraction of offenders also to be criminally active in adulthood. These theories explicitly predict the criminal behavior of each group to originate from distinct causal mechanisms. Two prominent examples of typological theories are Moffitt's dual taxonomy (Moffitt, 1993, 1997) and Patterson's model of early and late starters (Patterson & Yoerger, 1993; Patterson, DeBaryshe, & Ramsey, 1989).

Moffitt's taxonomy differentiates between life-course-persistent and adolescence-limited-offenders. Life-course-persistent offenders are characterized by criminal behavior that is chronic, frequent and versatile. The persistent criminal trajectory is thought to result from a combination of neuropsychological problems and failing parent/child interactions experienced prior to adolescence. Carrying with them the same underlying constellation of traits that caused them problems during childhood, life-course-persistent offenders continue to show antisocial and criminal behavior across different social settings as they age (a process called contemporary continuity). Their antisocial behavior is further supported and exacerbated by the ongoing negative interactions with their social environment (Moffitt, 1997). A 'bad' reputation or a police record for example may foreclose future opportunities like higher education or a lucrative job (a process called cumulative continuity or state dependence). The criminal behavior of adolescence-limited offenders on the other hand, which is temporal and less victim-oriented than that of persistent offenders, stems from the adolescents' upcoming desire to demonstrate adult autonomy. In modern society, social maturation lags behind biological maturation by five to ten years. During the resulting role vacuum, commonly referred to as the maturity gap, adolescence-limited offenders start to mimic the antisocial behavior of their life course

persistent peers who, as a result of their rebelliousness, already seem to enjoy adult privileges. However, unhindered by either individual shortcomings or a problematic history, adolescent limited offenders are, unlike their life-course-persistent counterparts, able to quickly respond and leave their delinquent behavior behind once conventional pathways to adult status, like work, marriage or parenthood become available.

In a similar way, Patterson and colleagues (1989) distinguish early from late starters. Early starters have the highest risk of becoming persistent delinquents. Due to poor parental discipline and monitoring these children begin to show antisocial behavior at a very young age. In turn, this early antisocial behavior precludes them from experiencing positive socialization forces in the peer group and school as they grow older. By the time these children reach adolescence they are more likely to stay committed to deviant peer group than children that have not previously experienced rejection from normal peers and academic failure.

3 Central hypotheses on criminal careers

The DLC-theories distinguished above differ in the interpretation and explanatory power attributed to between-individual differences in explaining the development of criminal behavior and in the processes they propose to generate within-individual change in that behavior. Using the distinction between static, dynamic, and typological theories as a framework, rival hypotheses on the effect of age, life circumstances and prior offending can be derived. These hypotheses will be treated in length in the subsequent chapters. Here, only a brief summary is given. The hypotheses derived cover three topics: (1) the effect of age, (2) the effect of life circumstances, and (3) the effect of prior offending. These topics are schematically represented in Table 1.

General static theories view criminal behavior as part of a general behavioral tendency influenced by a stable characteristic. Static theories predict that age has a direct effect on crime that cannot be explained by age-graded differences in life circumstances, associations or by any other sociological variable available in criminology (Hirschi & Gottfredson, 1983). Although static theories do not offer an explanation for the effect of age on crime they do postulate that the effect age has on crime is similar for all individuals. Thus, while individual criminal behavior may decline with age at the individual level, it will do so for every individual, leaving the relative ordering of individuals unchanged (Hirschi & Gottfredson, 1995).

Static theories further predict that, once criminal propensity is taken into account, the association between crime and life circumstances disappears. Static theories offer a social selection argument: individuals are likely to find themselves in the life circumstances that fit their criminal propensity. Finally, static theories contribute continuity in criminal behavior solely to contemporary continuity instead of cumulative continuity, thus denying that prior offending affects the risk of future offending.

General dynamic theories, unlike general static theories, argue that the effect of age on crime is indirect. The aggregated age-crime curve is mirrored at the individual level but while static theories attribute this to the direct effect of age on crime, dynamic theories argue this is caused by age-graded shifts in life circumstances within the population. As individuals age, chances increase they experience transitions in various life circum-

Table 1 Hypotheses on within individual change across theories

	Factors Of Within Individual Change		
	Age	**Life Circumstances**	**Prior Offending**
General static theories	• individual offending frequency declines with age for all individuals • the effect of age on offending frequency is direct and can not be explained by any sociological variable	• life circumstances do not causally affect offending • the observed association between life circumstances and offending results from social selection	• prior offending does not causally affect future offending • the observed association between prior and future offending results solely from heterogeneity in criminal propensity
General dynamic theories	• individual offending frequency declines with age for all individuals • decline in offending frequency with age is indirect and results from age graded shifts in life circumstances	• life circumstances affect offending • life circumstances are partly random events and the observed association between life circumstances and offending results from social causation	• prior offending affects future offending • the observed association between prior and future offending results at least partly from state dependence
Typological theories	• individual offending frequency declines with age for adolescence limited offenders, but not for life course persistent offenders • the decline in offending frequency with age for adolescence limited offenders results from changing contingencies	• life circumstances affect offending for adolescent limited offenders, but not, or to a lesser degree, for life course persistent offenders	• prior offending does not affect future offending for adolescence limited offenders because state dependence gains too little momentum • prior offending affects future offending for life course persistent offenders and reinforces persistence

stances that inhibit criminal behavior (Sampson & Laub, 2005). Changes in life circumstances are at least partly chance events, occurring regardless of the individual's criminal propensity.[1] Dynamic theories thus predict that life circumstances directly influence

1. Laub & Sampson recently (2003) have argued that human agency is important in explaining between and within-individual differences in life circumstances. While Laub & Sampson see agentic action as different from chance, key point here is that both are viewed largely independent from criminal propensity.

criminal trajectories. Dynamic theories also predict that prior offending influences criminal development, with prior offending increasing the risk of future offending. Via a process of state dependence, prior criminal behavior is argued to alter the individual or his life circumstances in such a way that future offending becomes more likely (Sampson & Laub, 1995).

Typological theories deny that the offender population is homogeneous, and make a distinction in groups of offenders. Moffitt's dual taxonomy (Moffitt, 1993) for example distinguishes life-course-persistent from adolescence-limited offenders. Life-course-persistent offenders show an early onset of delinquency as part of a childhood history of more general problem behavior. Based on the process of contemporary continuity – enduring individual characteristics continuously influencing crime over time –, typological theories predict that the criminal trajectory of persistent offenders is unaffected by either age or changes in life circumstances. Life-course-persisters are predicted to continue to offend at a high level far into adulthood. As these offenders age, a history of crime and deviance accumulates, further contributing to them persisting in their criminal behavior (Moffitt, 1997).

Unlike persistent offenders, adolescence-limited offenders in typological theories are predicted to show a decrease in criminal behavior upon entering adulthood. This age-graded change in criminal behavior results from these adolescents losing motivation to commit crimes as they start taking on adult social roles. Life circumstances are thus predicted to have a direct effect on the criminal behavior of adolescence-limited offenders. While prior criminal behavior is predicted to affect adolescence-limited offenders in much the same way it does persistent offenders, the forces of cumulative continuity gain less momentum for adolescence-limited-offenders because the latter lack a lifelong history of antisocial behavior like that of their persistent counterparts (Moffitt, 1997).

It is these hypotheses that are central to this thesis and which will be empirically tested in the subsequent chapters.

4 Limitations of prior research

Prior research has addressed several aspects of the above-mentioned hypotheses regarding the influence of age on crime, the impact of life circumstances on crime and the relationship between past and future offending. In a way developmental criminology itself has come of age, and some important transitions can be said to mark the developmental trajectory of the field itself (see also: Laub, 2004). In the light of this study, two methodological transitions are of particular interest since they directly relate to the extent they allow static, dynamic and typological theories to be tested.

The first important transition was that from cross-sectional data – data on different individuals at one point in time – to longitudinal data. In general, longitudinal research is time and resources consuming. In fact, much of the initial discussion surrounding the criminal career approach was about the desirability of allocating limited funds to expensive longitudinal projects (Blumstein et al., 1988a, 1988b; Gottfredson & Hirschi, 1988). For the moment the debate seems to be decided in favour of those in the longitudinal camp and many longitudinal studies have been carried out recently or are still underway.

The second transition pertains to the available statistical tools. In recent years developmental criminology has used increasingly complex statistical methods to analyze longitudinal data. In itself, statistical complexity does not equal progress. However, many of these new techniques are particularly suited to answer longstanding questions on developmental issues, enabling crucial tests between the different developmental theories. For example, Nagin and Land (1993) introduced a group-based model especially suited to test the existence of distinct subgroups of offenders in the population. Theoretical progress and statistical development in developmental criminology thus seem to go hand in hand, with new statistical methods allowing for more precise research questions to be addressed, while new theories ask new questions thereby providing thrust to develop new ways of analyzing data.

Below, prior research regarding the three major hypotheses of this thesis will be discussed against the background of these two important transitions in developmental criminology. Each paragraph will highlight current limitations in the available research and the way these limitations influence the possibility to test hypotheses from each of the three types of developmental criminological theories.

4.1 The age-crime relationship

Studies based on cross-sectional data have shown crime to peak in late adolescence and to gradually decline thereafter (Farrington, 1986; Junger-Tas, 1992). Since cross-sectional studies do not follow one person over time however, no distinction could be made between *participation* in offending and *frequency* of offending. In their 1983 paper, Hirschi and Gottfredson defended a static point of view and claimed that the age-crime relationship as observed at the aggregate level, mirrors that on the individual level – all individuals showing a rise and decline in crime *frequency* as they aged (Hirschi & Gottfredson, 1983). Those favouring a developmental approach, however, stated that the observed inverted u-shape could also result from age graded differences in *participation* – more adolescents than adults actively involved in crime – instead of from age-graded differences in frequency (Blumstein et al., 1986). Differences in participation are central to Moffitt's aforementioned dual taxonomy (Moffitt, 1993).

Later longitudinal studies affirmed the idea that age was also related to crime at the individual level (Piquero et al., 2003). Individuals were found to offend less frequently when they got older. However, there was also evidence of there being a 'vital few' – offenders who offended at high frequency and whose offending frequency seemed not to be influenced by age.

Typological theories have argued that the offender population is heterogeneous and that distinct types of offenders can be identified based on their pattern of offending over time. To test this typological argument researchers have, lacking more sophisticated statistical techniques, often categorized offenders based on generally reasonable, but nevertheless subjective criteria. Wolfgang, Figlio and Sellin (Wolfgang et al., 1972) for example, distinguished between chronic and non-chronic offenders: with those who committed five or more offences labelled chronics. In the Netherlands Block and Van der Werf (1991) defined 'career' offenders as those who had at least two official registrations, with one of them pertaining to robbery or sexual assault. A priori assigning offenders into categories does not allow testing for heterogeneity within the offender population but instead assumes it to be there. A priori creating categories also bears the risk of 'overfit-

ting' the data, that is, creating a number of groups where there is only random variation in the data (Nagin, 1999). In 1993 Nagin and Land introduced a new technique designed to identify homogeneous clusters of developmental trajectories in longitudinal data (Nagin & Land, 1993). This group-based trajectory model provided a crucial test for typological theories in assessing whether the different types of trajectories predicted by typological theories were actually present in the existing longitudinal data. Analyses using the group-based model in a number of different datasets have revealed several distinct trajectories (Nagin, Farrington, & Moffitt, 1995; Sampson & Laub, 2003; Wiesner & Capaldi, 2003). Most of these studies find evidence for the existence of a small group of offenders whose offending behavior is both frequent and persistent (Chung, Hill, Hawkins, Gilchrist, & Nagin, 2002; D'Unger, Land, McCall, & Nagin, 1998; Piquero, Brame, Mazerolle, & Haapanen, 2002; Raskin White, Bates, & Buyske, 2001).

In spite of longitudinal data and new analytic techniques, some important limitations of existing studies into the age-crime relationship should be mentioned. First, while longitudinal data has become more widely available, the majority of these studies only cover a limited period of the entire lifespan. Second, the primary focus of longitudinal research has been on the period in which participation in crime is the highest, namely during adolescence. As Sampson & Laub (2005) note there seems to be a preoccupation among developmental criminologists with the adolescent and preadolescent period, based on the popular idea that behavioral development is rooted in the early years of life, thereby underestimating variability in adulthood and the complexity of behavioral development as a whole. As a result of the limited follow-up periods and the bias towards youth, not much is known about offending later in life. The stability suggested by typological labels like 'life-course-persistent offenders' therefore is questionable, since the empirical data on which these typologies are based usually does not prolong respondents' mid-thirties. Third, as a result of their overrepresentation in aggregated crime statistics, most longitudinal studies pertain to the criminal behavior of boys only; leaving the behavioral development of girls and the applicability of developmental theories to it, open to question (but see: Farrington & Painter, 2004). A fourth and more technical argument is that many studies into the age-crime relationship are not able to control for what is known as 'false desistance' or the forced reduction of criminal behavior due to incarceration, deteriorating health, or death, resulting in underestimates of the persistence in crime for offenders experiencing such circumstances during the study's follow-up period (Piquero et al., 2001).

4.2 Life circumstances

Early evidence for the effects of life circumstances on crime comes from qualitative as well as quantitative studies of desistance. A common aspect of many of these studies is that they focus on between-individual differences in crime: those who are employed, married, or have children generally offend less than those who are unemployed, unmarried and childless. A study that did compare offending before and after marriage within subjects was that of Farrington and West (1995) using data from the Cambridge Study in Delinquent Development. They found that marriage decreased offending compared to staying single. Separation from a wife and having children out of wedlock however increased the risk of offending. Reanalyzing data from the Glueck-study (Glueck & Glueck, 1950), Sampson and Laub (1993) also found that a stable job and a satisfactory

marriage decreased the chance of offending compared to low job stability and being in an unsatisfactory marriage.

Static theories claim that both life circumstances and criminal behavior are influenced by the same underlying characteristic. The ingredients of this underlying variable – e.g., low-self control – will inevitably be incompletely measured possibly causing the results obtained by traditional statistical techniques to be overestimating the dynamic effects of life circumstances since no adequate controls for the effect of stable characteristics on life circumstances can be introduced. In 1995 Horney, Osgood and Marshall used hierarchical linear models that allowed for the simultaneous estimation of both the effects of unobserved heterogeneity in criminal propensity as well as the dynamic effects of life circumstances, differentiating between the two (Horney, Osgood, & Marshall, 1995). Studies using these models have shown life circumstances to have an effect on crime, even after unobserved differences in criminal propensity are controlled for (e.g., Laub & Sampson, 2003).

Although there seems to be considerable consensus with regard to the effect of life circumstances on crime, a few reservations are in place. First, many longitudinal studies pertain to a relatively small sample of non-representative individuals. This especially applies to Dutch studies – Dutch longitudinal studies including data on both criminal behavior and other life domains being few at all (see: Meeus & 't Hart, 1993 for an exception). Results obtained from biased samples only allow for limited generalization and compromise possibilities to adequately test existing developmental theories. For instance, little is known about whether the effects of life circumstances vary across offender characteristics. Finding an effect of life circumstances once between-individual differences in unobserved criminal propensity are taken into account disqualifies purely static explanations of criminal development in favor of dynamic ones. However, additional studies into the variation of the effects of life circumstances across offender groups are needed to test the typological premises that life-course-persistent offenders are insensitive to contextual change.

4.3 Prior offending

Early evidence for the effect of prior offending on crime came from the many recidivism studies that found criminal history to be a risk factor for repeat offending (for a recent overview see: Gendrau, Little, & Goggin, 1996). Recidivism studies however, are typically unsuited to test dynamic assumptions regarding the contagious effect of prior offending on future offending. An elaborate criminal history could also be interpreted as a proxy for high criminal propensity, that, unaffected by experience, increases the risk of recidivism. Much longitudinal research acted on this assumption – distinguishing adolescent offender groups based on previous levels of juvenile delinquency. To test for the existence of the state dependence effect of prior offending as proposed by dynamic theories, methods are needed that enable researchers to take initial between-individual differences in the chances of offending into account. Bushway, Brame and Paternoster (1999) reviewed a number of statistical techniques such as random effects models and hierarchical linear models, that allow for unobserved between-individual differences to be directly incorporated into the model. Results from studies using these kinds of models indicate that both static and dynamic processes are at play in bringing about continuity in crime. So far,

however, evidence on the relative contribution of both processes is still ambiguous (Nagin & Paternoster, 2000).

Many of the aforementioned studies used only a limited number of waves. Due to this, more elaborate predictions regarding the contagious effects of prior offending could not be tested. Typological theories would predict that as persistent offenders progress in their criminal careers, the effects of prior offences decreases as these offenders have already been severely marginalized. To test this hypothesis, panel data covering multiple waves is required, as are sufficient persistent offenders within the sample. Finally, the effect of prior offending has only been tested on American and British data (Ezell & Cohen, 2005; Nagin & Paternoster, 2000). Given that one way in which prior offending could influence future offending is via the labeling effects associated with being arrested or convicted, and given that important differences in penal culture between countries exist, research on data from other – European – countries is desirable.

5 Data

The present study was designed to overcome many of the limitations mentioned above and to – for the first time in the Netherlands – provide insight into the development of criminal behavior in the lives of individual offenders over a long period of time. To adequately test hypotheses derived from developmental theories, information on different life course domains was added to data concerning the criminal careers. The next section offers a description of the sample and the nature and origin of both the criminal career and life course variables.

5.1 The Criminal Career and Life course Study

The point of departure for the Criminal career and Life Course Study (CCLS) is the 1977 Recidivism sample as set up in the prior work of Van der Werff (1986) and Block and Van der Werff (1991). This sample was chosen from a listing of the datasets of Statistics Netherlands (CBS) to represent 4% of all cases that were either ruled upon by a judge or decided upon by the public prosecutor in 1977.[2] For each sampled case, information was available on the way the case was dealt with, the kind of offence of the 1977 case, and also on sex, ethnicity, employment status and type of occupation of the defendant. Sex, ethnicity and employment status were taken from the Information Records that the police fill out after arresting a suspect and that are collected by the CBS. Information on the 1977

2. In the Dutch criminal justice system the public prosecutor has the discretionary power not to prosecute every case forwarded to him by the police. The public prosecutor may decide to drop the case if prosecution would probably not lead to a conviction, due to lack of evidence, or for technical considerations (technical or procedural waiver). The public prosecutor is also authorized to waive prosecution 'for reasons of public interest' (waiver for policy considerations). The Board of prosecutors-general, the top of the prosecution service, has issued national prosecution guidelines. Under these guidelines a public prosecutor may decide to waive a case for policy reasons, if, for example: when measures other than penal sanctions are preferable or more effective, when prosecution would be disproportionate unjust or ineffective in relation to the nature of the offense or for reasons related to the offender, or when prosecution would be contrary to the interest of the state or the victim (Tak, 2003).

occupation was taken from the register maintained by the public prosecutor's office. Since cases for drunk driving proved to be very common, the percentage of cases for this type of offence was reduced to 2%. Cases for less common – mostly serious – offences and cases in which a custodial sentence was imposed were oversampled. In analyzing the data a weight factor is used to account for the stratification of the sample in such a way that the weighted sample again represents the distribution of offences as they were tried or waivered in 1977. The total number of cases per offence type, both weighted and unweighted is given in Table 2.[3,4]

Table 2 Number of individuals making up the CCLS-sample by type of 1977-offense

	# individuals	
Original sample	6,402	
Double-entries	57	
Not found in 1983	380	
Custodial sentences	309	
Resulting 1977-sample	5,656	
Not found in 2000	492	
Resulting CCLS-sample	5,164	
	# individuals	
	unweighted	*weighted*
Type of 1977-offence		
Violent	1,303	528
Property	1,626	1,965
Damaging/public order	595	594
Drugs	437	109
Other criminal law	44	51
Traffic	732	1,431
Other special law[a]	402	454
Misdemeanor	25	33
Total	5,164	5,164

a. e.g., violations of the Economic Offences Act

3. In 1983 the 4%-sample was augmented with an additional sample of youths receiving custodial sentences. At the start of the current study in 2000 however it was found that no data on this extra sample had been kept. Hence these individuals were not involved in the CCLS.
4. In subsequent chapters misdemeanor-charges were dropped from the analyses. In other words, while the 25 individuals (unweigthed) that were charged with a misdemeanor in 1977 were included in the sample, their individual criminal histories were based only on criminal offenses, as was the case for all other individuals. The decision to exclude all misdemeanor charges from the analyses was dictated by the fact that no reliable data on misdemeanors, especially for the period prior to approximately 1990, was kept in the General Documentation Files.

In the Recidivism 1977 study the criminal histories of the offenders in the sample up to 1983 were reconstructed using extracts from the General Documentation Files (GDF) of the Dutch Criminal Records Office. The GDF contain information on every criminal case that is registered at the Public Prosecutor's Office. Extracts from the GDF are comparable to 'rap sheets' in the United States. In 1983, researchers were unable to reconstruct the criminal histories of 380 defendants in this way. In addition 57 defendants turned out to have been entered more than once in the sample due to the fact they were registered for two different cases in 1977. If so, only the most serious case was retained. In 1986 the Research and Documentation Centre (WODC) of the Ministry of Justice published a report on the recidivism of this sample – that excluded defendants of non-Dutch origin[5] – in the six-year period between 1977 and 1983 (Werff, 1986). At the end of this six-year follow-up period, 51% of the sample had been reconvicted at least once. In 1991 this report was followed by a study aimed to identify the most active and dangerous offenders in the sample (Block & Werff, 1991).

A prominent goal of the current study is to describe the long-term criminal careers of a Dutch offender population. Since the Recidivism 1977 sample was specifically constructed as representative of the Dutch prosecuted offenders, and the dataset offered the opportunity to be extended to 25 years, the Recidivism 1977 sample was chosen as the starting point of the CCLS. By the year 2000 it became evident that only an anonimized dataset had been preserved, containing only the case-numbers from the public prosecutor's office. The latter half of 2000 and the first months of 2001 were spent traveling around in the Netherlands, visiting everyone of the 19 court districts and collecting personal data on the offenders in the sample from the public prosecutor's registry. Since in 1977 no electronic records were kept, this had to be done by manual search.

Once the personal data was collected, the GDF was searched to obtain information on all criminal cases registered for the offenders in our sample. By the end of the data collection, the prospective follow-up period of the sample had been extended from the original six to 25 years, spanning the period 1977–2002. The information on the extracts was supplemented with cases that would normally have been dropped from the file due to expiration periods. In this way, the entire criminal histories up to 2002 as embodied in the GDF could be reconstructed for 5164 of the original defendants.

Based on the GDF-abstracts and the police files pertaining to the 1977-offence several individual characteristics of the individuals in the sample could be noted. Nearly one tenth (9.7%) of the 5,164 individuals in the CCLS-sample were women. Of all individuals 13.3% was born outside the Netherlands. The majority of individuals of foreign-birth was Surinamese, reflecting the composition of the Dutch immigrant population at the time. Four out of ten individuals were unemployed during the time of their 1977-offence. The police in 1977 also classified individuals as being alcohol- or drug-dependent.[6] One third of the sample was classified as alcohol-dependent at the time of their 1977-offence and 2% was classified as drug-dependent (see Appendix A).

5. Foreign-born offenders were excluded from the sample because no reliable data were available on their possible criminal history in their former country of residence.
6. Given that this classification was based in part on information provided by the arrestees themselves and given that some arrestees may try to conceal their addiction from the police, this classification needs to be interpreted with caution (see also: Jacobs & Essers, 2003).

For the CCLS, every case mentioned on the GDF extracts was coded, regardless of its disposition. The CCLS-data file contains information on cases that resulted in acquittal, in conviction, and on cases that were fined or waivered by the public prosecutor for policy or technical reasons, such as lack of evidence.[7] However, unless otherwise noted, analyses reported here will be based solely on those cases that resulted in a conviction by the court of first instance or resulted in a prosecutorial fine (transaction)[8] or policy waiver. Many of the criminal cases mentioned on the GDF extracts pertain to several offences and with regard to every offence several charges can be noted. This was dealt with in the following way. Every offence per case was coded separately. To prevent double counting, cases that had been added to another case were dropped from the data, since the offences from the added case also appear on the added-to case. Per offence the charge with the highest threat of punishment was coded.[9] Finally, the GDF extracts do not contain information on the perpetration date of the offence – at least not for those offences registered before approximately 1994 –, but do give the day the case was registered at the public prosecutor's office. Thus in the CCLS the moment of registration at the public prosecutor's office is used to date the offence.[10]

5.2 The NSCR national crime survey

The second dataset used here is from a national crime survey carried out in 1996 by the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR). These data were collected by using a multistage cluster sampling procedure to obtain a nationally representative sample of the Dutch population aged 15 years or older (N = 1,939), oversampling those between 15 and 30 years old (N = 1,012) resulting in a total sample of 2,951 individuals. In a private setting, one-hour-long face-to-face interviews were conducted using a computer providing the possibility for the respondent to directly type in the responses (CAPI). During the interviews respondents were asked to fill out a life history calendar of major life events (see also: Caspi, Moffitt, Thornton, & Freedman, 1996). In this way information was collected about the respondent's marital, fertility, and employment history. Subsequently, respondents were asked if they had ever committed one or more of a number of different types of offences, with the previously completed life history calendar used as a reference to facilitate recall. Those respondents who indicated

7. See footnote 1.
8. Strictly speaking a transaction is not a fine, but a form of diversion in which the offender voluntarily pays a sum of money in order to avoid further prosecution and a public trial (Tak, 2003). However, common experience is that of a fine.
9. In the Netherlands the writ of summons may contain a primary charge (e.g. murder) and several subsidiary charges of reducing severity (for example: manslaughter, liable death). This is done to prevent defendants from being acquitted in cases were there is sufficient evidence the defendant has committed a certain act, but not all aspects from the primary charge (e.g. aggravating circumstances) can be proven beyond reasonable doubt. By structurally selecting the primary charge in this study, the severity of the criminal offenses defendants are convicted for are slightly overestimated. However, given that offences in subsidiary charges are often similar in nature (e.g. violent of property offences) this thus not influence the results presented in this study.
10. This means that offenses are structurally dated somewhat later than they were committed. In general however, registration at the public prosecutor's office takes place early during the police investigation since registration is needed to exercise a number of investigative powers such as requesting an examining judge to order a suspect to remain in pre-trial detention.

having committed a certain type of offence were asked to recall the year in which the most recent incident had taken place. Respondents were then asked whether they had previously committed that kind of offence and in which year that had done so. This question was repeated for every offence type until all offences reported had been dealt with. Because the latter questions were expected to be more liable to produce socially desirable responses if the respondent had to answer the interviewer in person, the respondents could fill out this part of the questionnaire themselves on the computer, without the interviewer being able to see. Wittebrood and Ter Voert (1997) provide a detailed discussion of the sampling design and data collection issues (see also: Wittebrood & Nieuwbeerta, 1999; Wittebrood & Nieuwbeerta, 2000).

The self-report data from the national crime survey are especially suited for the purpose of this study since they contain information on both criminal behavior and life circumstances over a long period of individual's lives. These data therefore allow for the testing of several of the hypothesis regarding the effects of age, life circumstances and prior offending on the development of criminal behavior over the life span. In doing so these data, combined with that of the CCLS provide the additional opportunity to examine differences in findings between analyses on self-reported versus officially registered crime.

6 Research questions and outline of the thesis

This thesis aims to describe the long-term development of criminal behavior and to test hypotheses derived from the various types of theories explaining the development of criminal behavior over the life course. Chapter 2 describes the criminal careers of the individuals in the CCLS-sample, both for the period following the 1977 offence, as well as their entire careers from first conviction to the year 2002. Chapter 3 provides a group-based trajectory analysis of the entire criminal careers of the sample. In Chapters 4 and 5 data on other life domains gathered in the CCLS dataset are used to test hypotheses derived from developmental theories explaining individual development in crime over time. Both Chapters 4 and 5 contain complementary analyses based on the self-report data from the 1996 national crime survey. A schematic representation of the outline of the book is given in Table 3.

Chapter 2 first addresses the prevalence, speed and frequency of recidivism in our sample over the 25 year period following the 1977-sampling offence. Comparisons between offenders with different personal and criminal career characteristics will show whether these factors are differentially related to recidivism prevalence and recidivism frequency. Making use of the long prospective period over which data has been collected in the CCLS, Chapter 2 also asks: what is the prevalence and speed of termination? As for recidivism, the relations between termination on the one hand and personal and criminal career characteristics on the other are analyzed. Finally, using the offenders' entire criminal histories, so also those preceding 1977, Chapter 2 describes the distribution of criminal career length and asks what personal and criminal career characteristics are associated with criminal career duration? By comparing the correlates of the different career dimensions Chapter 2 sets the first step in testing static and dynamic theories for the development of criminal behavior over time.

Table 3 Outline of the thesis

	Chapter 2	**Chapter 3**	**Chapter 4**	**Chapter 5**
Question	What are the prevalence, speed, and frequency of recidivism/termination?	To what extent do trajectories differ for different types of offenders?	To what extent do life circumstances affect criminal behavior?	To what extent does prior offending affect criminal behavior?
Data	CCLS (conviction data)	CCLS (conviction data)	CCLS (conviction data) and Crime Survey (self report)	CCLS (conviction data) and Crime Survey (self report)
Dependent variable	Participation, Frequency, Crime mix, Age of onset, Age of termination Duration	Offense(s) per year (count)	Offence(s) per year (count)	Offence(s) per year (dichotomous)
Independent variable	Demographics Career characteristics	Demographics	Time varying life circumstances Types of offenders (by sex and age of onset)	Time varying life circumstances Prior offending
Statistical technique	Descriptive statistics Discrete event analysis, Multivariate regression	Semi-parametric group based models	Multi-level growth curve analysis	Multi-level growth curve analysis

Chapter 3 offers a more precise test of the three kinds of DLC-theories and focuses on the criminal careers over the entire life span of the CCLS-sample, including the period before 1977. Using a group-based modeling approach, Chapter 3 asks: is there evidence for criminal trajectories that are distinct in terms of time path within the entire conviction histories of the CCLS-sample from age 12 to age 62? Special attention will be paid to whether there is evidence for the existence of a small group of offenders who persist in crime and remain criminally active far into adulthood. Chapter 3 also compares the crime mix between trajectory groups and asks: is there evidence that persistent offenders are disproportionably engaged in violent crimes? Comparisons across narrower age-cohorts within the general sample are made to assess the stability of the trajectory outcomes across age-cohorts. By comparing the time paths and crime mix of different trajectories, Chapter 3 puts the 'generality' assumption of general theories to the test.

Chapter 4, answering one of the main claims of dynamic theories, investigates the impact of life circumstances on criminal behavior. To what extent do life circumstances still affect the likelihood of engaging in criminal behavior even after enduring individual differences are taken in consideration? Both the CCLS and the crime survey data are used for answering this question. Chapter 4 also examines the extent to which the age-crime relationship varies between types of offenders and whether the extent to which life

circumstances affect offending varies between offenders. Chapter 4 thus contrasts general static and general dynamic theories with respect to the predicted effect of life circumstances. It further tests the generality of contextual influences as assumed by general dynamic theories against the offender-specificity predicted by typological theories. Finally, by examining to what extent variation in crime by age at the aggregate level is due to age-graded differences in life circumstances and the distribution of offender types in the population, Chapter 4 addresses the claim made by static theories that sociological variables do not explain the age-crime relationship.

Chapter 5, the last empirical chapter, deals with continuity in offending. To what extent can continuity in offending be attributed to stable individual differences in criminal propensity and to what extent is it caused by the contagious effects prior offending has on the probability of future offending? Again using both datasets, Chapter 5 examines to what extent contemporary continuity and cumulative disadvantage resulting from a state dependence process can explain the positive association between prior and future offending. In doing so, Chapter 5 tests static against dynamic theories. By addressing the changing impact of prior offending at different stages in the criminal career, Chapter 5 also reflects on the stability of criminal propensity as assumed by static and typological theories.

Finally, Chapter 6 provides a summary of the main findings from this study and recapitulates answers to its two general aims. By evaluating this study's hypotheses, data, and methods against the existing developmental and life course literature within the criminological field, this study's contribution to Developmental and Life course Criminology is discussed. Based on this evaluation further directions for both theoretical and empirical study are provided.

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Appendix A Mean and standard deviations of personal and offending characteristics for the entire sample in 1977

	1977 (N=5,164)		
	range	mean	std. dev.
Personal characteristics			
Age in 1977			
10-14 years	0-1	0.02	0.15
15-19 years	0-1	0.23	0.42
20-24 years	0-1	0.22	0.41
25-34 years	0-1	0.28	0.45
35-44 years	0-1	0.14	0.35
> 44 years	0-1	0.10	0.30
Sex			
female	0-1	0.10	0.30
Country of origin			
non-Dutch	0-1	0.13	0.34
Occupational status			
high	0-1	0.27	0.44
low	0-1	0.31	0.46
unemployed	0-1	0.42	0.49
Dependency indication			
alcohol	0-1	0.34	0.47
drugs	0-1	0.02	0.14
Offending characteristics			
Prior convictions			
no prior convictions	0-1	0.48	0.50
Type of offense in 1977			
violent	0-1	0.10	0.30
property	0-1	0.38	0.49
damaging/public order	0-1	0.12	0.32
drugs	0-1	0.02	0.14
other criminal law	0-1	0.01	0.10
traffic	0-1	0.28	0.45
other special law[1]	0-1	0.09	0.28

1 e.g., violations of the Economic Offences Act

Chapter 2

Long-term criminal careers: a descriptive analysis of the conviction histories of adult Dutch offenders

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Abstract

This paper describes the criminal careers of over 5,000 individuals who had their criminal case tried in the Netherlands in 1977. Following the criminal career approach six career dimensions were recognized: participation, frequency, crime mix, age of onset, age of termination and career duration. First, recidivism prevalence, frequency and crime-type in the period 1977–2002 were analyzed. Next, these analyses were repeated using data on the entire criminal careers preceding 2002, adding age of onset and career duration. In the 25-year period between 1977 and 2002, 65% of the sample was convicted for at least one subsequent offence, with an average recidivism frequency of 9.4 offences. The distribution of recidivism frequency was found to be highly skewed: a small (3.0%) percentage of individuals being responsible for a disproportionate share (30.0%) of all offences the entire sample was convicted for in the 1977–2002 period. A similar pattern was also found when analyzing the offenders' entire careers. The average age of onset was 20.5, while the average age of termination was 38.6. Measured over the entire criminal histories the average criminal career spanned 19.4 years. The various career dimensions were found to be associated with offenders' sex, ethnicity and age of onset.

1 Introduction

In his 2002 Sutherland address at the American Society of Criminology meeting, David Farrington indicated that the two main issues of Developmental and Life course Criminology (DLC) are the *description* of the development of offending with age, and the *identification* of risk factors and life events that affect the course of that development (Farrington, 2003; see also Loeber & LeBlanc, 1990: 377). In describing various dimensions of the development of criminal behavior over the life course, DLC is tributary to the criminal career paradigm that became influential during the latter part of the nineteen eighties and which provided DLC with the basic conceptual tools (Blumstein, Cohen, Roth, & Visher, 1986). In turn, the criminal career paradigm can be traced back to the epidemiological roots of criminology itself, making present day DLC the latest branch on a lengthy pedigree (Piquero, Farrington, & Blumstein, 2003).

Developmental and life course criminology unifies three other perspectives on the development of offending over time: the prevention-orientated risk factor approach (Farrington, 2003), the more theory-driven developmental criminology (LeBlanc & Loeber, 1998; Loeber & LeBlanc, 1990), and the relatively new life course approach to criminal behavior (Sampson & Laub, 1993), which emphasizes the importance of life course transitions in explaining criminal development. Despite its long history in the field of criminology however, the developmental approach has only been fully embraced by criminologists relatively recently (LeBlanc & Loeber, 1998). Longitudinal studies – indispensable when studying change in behavior over time –, are both time and money consuming and therefore usually cover only a limited period of the lifespan. Furthermore, researchers within the risk factor paradigm as well as developmental criminologists initially focused on the childhood and adolescent period (Adams, 1997; Sampson & Laub, 1992). This has contributed to the fact that notwithstanding its long history and the significant volume of longitudinal research that was published over the last 20 years, the answers to many DLC-questions, especially those regarding criminal development during the adult period, are far from unequivocal (Farrington, 2003; Piquero et al., 2003; Laub & Sampson, 2003).

Do all individuals start offending young, or are there offenders who start their criminal careers later in life? What types of crime constitute the average criminal career? At what age do offenders terminate their criminal behavior? What is the average duration of the criminal career of active offenders? How is the frequency of offending related to career duration? How do these career dimensions relate to offender characteristics? These and similar questions have remained largely unanswered, especially within a non-Anglo-American context.

In this study we address these and related questions describing the criminal careers of a national representative sample of 5,164 individuals whose criminal case was decided upon by a Public Prosecutor or tried by a Dutch court in 1977. Our data are derived from the Criminal Career and Life course Study (CCLS) that is currently being carried out at the Netherlands Institute of Crime and Law Enforcement (NSCR) and pertain to the entire officially recorded criminal careers of all the individuals in the sample up to the year 2002. Given the long prospective period on which data was collected, this dataset is especially suited to study long-term recidivism, termination, and criminal career duration. Our study contributes to the current state of knowledge in several important ways.

Whereas many studies have been based on either a limited number of individuals, a short time span, or both (Farrington, 2003; Piquero et al., 2003), our study provides data on a large, representative sample over a long period of time. In addition, serious offenders are overrepresented in our sample enabling a more correct estimation of the several career dimensions.[1] High-rate offenders are often missing in population samples, thereby possibly underestimating true offence rates or career durations (Piquero et al., 2003).

2 Dimensions of criminal careers

Researchers from different backgrounds find concurrence within DLC in the way it looks to individual offending as a career. A criminal career is defined as the trajectory of the individual's criminal activity from the first to the last offence (Blumstein et al., 1986). The term career refers solely to the longitudinal sequence of crimes committed by an individual offender and does not imply upward mobility. Nor does it mean that criminal activity is the individual's means of subsistence (Blumstein & Cohen, 1987). One can have a criminal career without making a career out of crime. In their 1986 report the National Academy of Sciences panel on criminal careers argued that the study of criminal careers should focus on four important career dimensions: participation, frequency, crime mix and career duration (Blumstein et al., 1986). Participation refers to the distinction between those who commit crime and those who do not. Frequency, also called lambda, refers to the number of crimes committed by an active offender within a given time period. Crime mix – the combination of crimes committed by an active offender – is important for answering questions regarding specialization (the tendency to repeat criminal offences of an particular kind in the course of a criminal career), versatility (the number of different offence types committed), and escalation (the tendency to commit offences of an increased level of seriousness during the course of a criminal career). Finally, career duration refers to the time between onset and termination – the time between the first and last known offence. These dimensions have since been central in studies on criminal careers. Over the years, others have added important dimensions to this list (LeBlanc & Loeber, 1998; Loeber & LeBlanc, 1990). Loeber and Le Blanc (1990) refer to participation, frequency and crime mix as generic concepts, while referring to age of onset, age of termination and career duration as boundary concepts because they represent the temporal boundaries of offending.

Empirical evidence on criminal career dimensions is of importance to both DLC-theory and public policy regarding crime. Different developmental criminological theories offer rival predictions regarding the distribution and associations among the various career dimensions. Current criminological typologies, like Moffitt's distinction between adolescence limited and life course persistent offenders (Moffitt, 1993), claim that different types of offenders show different criminal trajectories: a small group of offenders showing an early onset, having higher lambdas and also being more versatile and persistent in their criminal behavior (Moffitt, 1993, 1997). The skewness of the offending frequency distribution as well as the relationship found between age of onset and career duration have been interpreted as favoring typological theories. In contrast, general

1. This overrepresentation is corrected for by using a weight-factor in all analysis (see method section).

theories predict offending to decrease with age for all active offenders (Gottfredson & Hirschi, 1990; Laub & Sampson, 2003).[2] Gottfredson and Hirschi have gone as far as to claim that all dimensions of the criminal career are influenced by the same underlying construct – self-control (Gottfredson & Hirschi, 1986, 1988). Individuals low on self-control would be more likely to participate in crime, more likely to offend frequently and less likely to terminate their careers than individuals high on self control. Knowledge on the correlates of criminal career dimensions and the way these dimensions vary among subgroups of offenders is relevant for determining whether typological theories are warranted to explain individual criminal development or whether more general theories suffice. Better understanding of the career dimensions would also aid policies designed to prevent or redirect an individual's criminal career (Blumstein, 2004). For example, knowledge on offending frequency, crime mix, age of termination and career duration, speak directly to issues related to incapacitation: the number and type of crime prevented will depend both on the frequency as well as the duration of an offender's criminal career (Piquero, Brame, & Lynam, 2004).

In this chapter we describe the six dimensions distinguished in the career approach to crime: (1) participation, (2) frequency, (3) crime mix, (4) age of onset, (5) age of termination, and (6) duration. Our analyses have a dual focus, describing both patterns of long-term recidivism in the CCLS sample since 1977 and describing the development of offending over the entire criminal careers of these individuals up to 2002. In the following, first we describe patterns of long-term recidivism in the CCLS-sample based on data on the period between 1977 and 2002. Participation – or prevalence of recidivism –, recidivism frequency, as well as the mix of crimes committed over this 25 year period will be analyzed. Attention will also be paid to the age at which offenders terminate their criminal careers making use of the long prospective period on which data was collected. Next, we turn to the offender's entire criminal history and offer a description of all six distinguished career dimensions. The aforementioned analyses on recidivism are repeated within the context of the offender's entire criminal careers and augmented with analyses of age of onset and career length. Finally, we will explore variations in these career dimensions that are associated with offender's individual characteristics.

3 Prior research

In recent years the developmental approach has gained in popularity, resulting in an increasing amount of longitudinal data on both the generic as well as the boundary concepts becoming available (Benson, 2002; Farrington, 2003; Piquero et al., 2003). In this section we will briefly review the main results of prior research on the six distinguished career dimensions, as well as the way they are associated to various individual characteristics. In doing so we will limit ourselves to the individual characteristics that have proven to be of substantial influence and are available in the CCLS-data set (for a more elaborate

2. General *static* differ from general *dynamic* theories in that the former postulate that the age-crime relationship is invariant, while the latter acknowledge variability around the age of desistance. Both general *static* as well as general *dynamic* theories however postulate that crime declines with age (Paternoster, Dean, Piquero, Mazerolle, & Brame, 1997).

review see: Laub & Sampson, 2001; Piquero et al., 2003). Finally, since the effect of age on criminal careers is complex and constitutes one of the key-points in the debate surrounding developmental approaches to crime (Blumstein et al., 1986; Gottfredson & Hirschi, 1986), these effects deserve extensive treatment which would intervene with the general and descriptive nature of the current study. Therefore possible age effects on criminal careers are largely left aside here and treated more comprehensively elsewhere (Chapters 3 and 4).

Participation

Estimates of life-time participation in crime in earlier studies based on official data range from 7 to 50 percent, depending on how participation is defined, on the time period over which participation is measured, and on the characteristics of the sample used (Piquero et al., 2003: 429). During a thirty year follow-up of over 500 American males born between 1925 and 1934, McCord (1978) for example, found that 27.5% of the men was convicted at least once. More recently, Farrington (2001) found that of the high-risk London boys in the Cambridge study on Delinquent Development 40% had been convicted by age 40. Participation estimates using self-report data are usually higher. In comparison, 96% of the males in the Cambridge study reported to have committed at least one – mainly less serious – offence up to age 32 (Farrington, 2001).

Participation is higher among men than among women (Blumstein et al., 1986). In the New Zealand Dunedin cohort, consisting of all children born in the Dunedin maternity hospital between April 1972 and March 1973, the male to female conviction ratio up to age 21 was 2.5:1 (Moffitt, Lynam, & Silva, 2001). This ratio is even larger when only violent crimes were taken into account. Stattin, Magnusson and Reichel (1989) found that of a representative sample of Swedish juveniles 38% of the males and 9% of the females had been registered for a criminal offence by age 30. Using self-report data from the National Youth Study, Elliott (1994) found that the participation rate up to age 27 for serious violent offending was over twice as high for males than for females – respectively 42% versus 16%. American studies using official data have also reported greater participation for blacks than for whites (Visher & Roth, 1986). In her follow-up of the 1958 Philadelphia birth cohort, Kempf (1990) found that regardless of juvenile delinquency, participation among blacks was higher between ages 18 to 26, than it was for whites; the black/white adult ratio in court charges for those without police contacts prior to age 18 being 1.7:1. Self-report studies however find less pronounced differences. For example the aforementioned study by Elliott (1994) found a black-to-white ratio of 1.25:1.

Frequency

Spelman (1994) summarizes findings on individual arrest frequency in both longitudinal and retrospective studies and concludes that the average arrestee is arrested about six times a year. Estimates of offence frequency using official data however are complicated by the fact that official records undercount the total number of offences. Not surprisingly, offence frequencies are much higher in self-reports compared to official records (Blumstein et al., 1986). Furthermore, individual offence frequencies are found to be highly skewed with a small fraction of the population committing a large fraction of all crimes (Spelman, 1994). Wolfgang, Figlio and Sellin (1972) found that in the 1945 Philadelphia birth cohort 18% of the active offenders in the sample was responsible for 52% of all the

sample's offences. Similarly, Block and Van der Werff (1991) using Dutch conviction data found that 4.8% of the offenders they labeled 'career' offenders accounted for 14.7% of the total number of convictions during the six year follow-up period of the study. These findings suggest that the overall average is highly influenced by the large portion of 'sporadic' offenders being arrested only once or twice.

Offence frequency shows much less variation by gender and ethnicity than does participation. The aforementioned review by Blumstein (1986) showed that for most crimes the male-to-female ratio was 2:1 or less. Both findings from studies using official data and those from studies using self-reports further suggest that with regard to ethnicity the black-to-white ratio is close to 1:1.

Crime mix

Studies into the mix of crimes committed by individual offenders have often been framed in terms of specialization versus versatility. In general, criminal careers tend to be characterized by versatility rather than specialization (Farrington, 2003; Piquero et al., 2003). However, some evidence for property specialization exists (Spelman, 1994). Evidence also suggest that while offence seriousness increases during adolescence, the seriousness of offending tends to stabilize and then decrease as offenders reach adulthood and commence further in their criminal careers (Cohen, 1986).

Despite versatility being common, there is some evidence of differences in crime mix across demographic groups (Piquero et al., 2003). For example, using British conviction data, Soothill, Francis and Fligelstone (2000) found women to be less versatile in their offending than men (but see: Mazerolle, Brame, Paternoster, Piquero, & Dean, 2000). Ethnic differences in crime mix seem to be restricted to chronic offenders. Using data from both the 1945 and the 1958 Philadelphia birth cohort Tracy, Wolfgang and Figlio (1990) found that among offenders with at least five arrests white offenders most often repeated theft offences, while non-white offenders repeated more offence types than their white counter parts specializing also in injury offences. No differences in specialization were found for offenders with less than five arrests. Finally, versatility appeared to be unrelated to age of onset when current age was controlled for (Piquero, Paternoster, Mazerolle, Brame, & Dean, 1999).

Age of onset

Most offenders commit their first offence prior to age eighteen (Piquero et al., 2003). As with participation the estimates of age of onset depend on the definition used. The average age at first conviction in the Cambridge study was 18.6 (Farrington, 2001). The peak age of first conviction – measured up to age 32 – was 14. A later study by Farrington and Maughan (1999) using a cohort similar to that of the initial Cambridge study but of boys born seven years later, yielded highly similar results. In the 1945 and 1958 Philadelphia birth cohorts using police records, the peak in the age of onset was at 16 and 15 respectively (Tracy et al., 1990). Self-reported ages of onset tend to be somewhat lower. In his study on serious violent delinquency Elliott (1994) found that over half of the violent offenders reported committing their first violent offence between ages 14 and 17.

Men tend to start their criminal careers at a younger age than women. For example, Stattin, Magnusson and Reichel (1989) following a representative sample of Swedish juveniles from age 10 to 30 found the peak age of onset for males was 16–17, while that

for females was 21–23 (see also: Kyvsgaard, 2003). In the National Youth Study blacks reported a lower peak age of onset than did whites, 15 versus 16 respectively (Elliott, 1994). Arrest data from the Philadelphia birth cohort yielded similar findings (Wolfgang, Figlio, & Sellin, 1972).

Age of termination

The estimated peak age of termination is between 20 and 29 (Farrington, 1992). Research into the age of termination is complicated by the truncation of the follow-up period in any longitudinal study that does not follow its subjects until they die, making it difficult to determine when an individual's criminal career has truly ended (Piquero et al., 2004). This is illustrated by the findings of Farrington, Lambert and West (1998) who collected data on the conviction histories of both the parents and siblings of the boys initially involved in the Cambridge study. Based on data up to age 40 the mean age of termination for the study's males and siblings was 24–26. However, based on data up to age 70 on average for the male's fathers and up to age 67 on average for the male's mothers, the mean age at termination was 36 for the fathers and 38 for the mothers.

Age of termination does not seem to vary strongly with sex. In the Farrington, Lambert and West study the wives and sisters of the Cambridge study males were found to have a mean age of termination of 25 and 24 year respectively compared to that of 26 and 25 years for the males themselves and their brothers. Their mother's average age of termination exceeded that of their father's by almost two years.

Duration

Estimates of the duration of the average criminal career vary between 5 to 17 years (Piquero et al., 2003). As with age of termination estimates of career duration depend largely on the length of the follow-up period of the particular study and the assumptions under which the estimate was reached (Spelman, 1994). Based on data from the Cambridge study up to age forty, Farrington, Lambert and West (1998) found – excluding one-time offenders – the average criminal career to span 8–11 years. These researchers also analyzed the criminal careers of the male's parents. The average career duration for the older generation was 15–16 years. Recently, Piquero, Brame and Lynam (2004) studied data from the California Youth Authority and examined the criminal career duration of 377 male parolees and found the majority of criminal careers spanned between 15 and 20 years, with an average of 17.3 years.

Men tend to have longer careers than women. While the average age of termination was higher for mothers than for fathers of the Cambridge study males, the average criminal career of the fathers exceeded that of the mothers by over a year. The average career duration for males and their brothers exceeded that of sisters and wives by over two years (Farrington et al., 1998). In addition, Piquero, Brame and Lyman (2004) found non-whites to show slightly longer average careers than did whites – 17.7 versus 16.7 years respectively. Age of onset has also been found to relate to criminal career duration, with an early onset predicting a lengthier criminal career (Visher, 2000). Excluding one-time offenders, those Cambridge study boys who experienced onset between 10 and 13 had an average career duration of 11.6 years incurring 8.8 offences, while the average number of years between their first and last offence of those who experienced onset between ages 21 and 30 was 2.3 years incurring 1.8 offences (Farrington et al., 1998).

3 Data and Method

3.1 Data

The dataset used in this study is compiled from the large-scale Criminal Career and Life course Study (CCLS) that is being carried out at the Netherlands Institute for the Study of Crime and Law Enforcement. Major goal of the CCLS is to describe and understand the development of criminal behavior over the entire life span. The CCLS is based on a 4% sample of the cases of serious offences that were tried in the Netherlands in 1977 (Block & Werff, 1991; Werff, 1986). Given the large amount of cases involving drunk driving the sampling rate for this type of offence was limited to 2%. To insure their adequate representation in the final sample a number of less common offences (violent, sexual and drug offences) were sampled at a higher rate. When analyzing the data every individual is assigned a weight factor based on their 1977 offence in such a way that the distribution of offence types in the sample resembles that of offence types as they were tried in 1977. The final sample consists of 5,164 individuals. Further details of the sampling procedure are given in Nieuwbeerta and Blokland (2003).

Abstracts from the General Documentation Files of the Criminal Record Office (comparable to 'rap sheets' as used in America) were used to construct the entire criminal career of the individuals in the CCLS-sample. The GDF contain information on every case that is registered by the police at the Public Prosecutor's Office. These GDF-abstracts were supplemented with cases that normally would not be mentioned due to periods of prescription. In the Netherlands a person is not given a 'blank sheet' upon becoming adult. The abstracts used thus contain information on both juvenile and adult offences. In this way the entire criminal history of the individuals in the CCLS-sample prior to 2002 was recorded. Given that the mean age of the sample in 1977 was 28, these criminal histories pertain to the early- as well as the late-adult period of most offenders in our sample. The GDF contain information on cases that were followed by a conviction, an acquittal, as well as cases that were waivered by the Public Prosecutor due to policy reasons or insufficient evidence. In this study we only use those cases that were followed by a conviction or by a prosecutorial waiver for policy reasons, referring to both as 'convictions' for sake of readability. Throughout the remainder of this chapter 'offending' and 'convictions' will be used interchangeably. However, since our study is based on official data, the reader should be aware that by this we necessarily refer to only those offences that came to the attention of the judicial authorities and amounted to a registration.

The analyses pertaining to the prevalence of recidivism in the 1977–2002-period concern all the individuals in our sample. Since no data was available on the possible criminal records in their former country of residence for those born outside the Netherlands (13.3% of the entire sample), we limited our sample for the analyses of the entire criminal career to those offenders born in the Netherlands.

3.2 Dimensions

In this study *participation* is defined as being 'convicted' at least once. Recidivism equals participation in the 1977–2002. Thus, an individual is said to recidivate in the first year, following the year of registration of the criminal case based on which that individual was included in the sample, in which a new case leading to a conviction or prosecutorial disposition due to policy reasons was registered in the GDF.

Frequency of offending is measured by adding the number of offences an individual was convicted for during the given period (1977–2002 or the entire criminal career). Measures of offending frequency may suffer from 'false desistance' – individuals not being able to offend due to incarceration or mortality –, leading offence counts to underestimate the true offending frequency. Considering false desistance in our sample, data on incarceration was taken from the GDF-abstracts. To account for incarceration time in the recidivism and termination analyses, years in which an offender was incarcerated for more than 180 days were dropped from the data.[3] In other words, recidivism and termination analyses used exposure time; exposure time being defined as the total number of years an individual was 'free on the streets' for at least six months within a given period. Furthermore, due to mortality before 2002 the follow-up period does not necessarily span the entire 25 years between 1977 and 2002 for all individuals. This may pose problems especially if mortality is related to offending behavior. Prior research (for a review see: (Laub & Vaillant, 2000) and analyses on the CCLS-dataset (Nieuwbeerta & Deerneberg, 2004) indicate that frequent offenders indeed have a higher mortality risk. If those who offend frequently have a higher chance of dying during the follow-up period, using the frequency measure as just defined tends to underestimate the difference between frequent offenders and less frequent, but surviving offenders. For these reasons the analyses regarding recidivism frequency were replicated using a 'corrected' lambda: the total number of convictions for a person divided by total number of follow-up years while free for that person.

In order to describe the *mix of crimes* committed, offences were classified in eight categories based on the standard classification of Statistics Netherlands. These categories are: violent offences (including sexual offences and robbery), property offences, vandalism and offences against the public order, drug offences, offences of the Firearms act, and other criminal law offences. In addition, two special law offence categories consisting of traffic offences – mostly drunk driving and hit and run driving – and a broad category covering all other special law offences were distinguished.

The boundary concepts were measured as follows. *Age of onset* was defined as the age at which an individual was first 'convicted'. The *year of termination* is defined as the year of the last known registration for a case leading to a conviction or prosecutorial disposition due to policy reasons, but only if the remaining period between that year and the end of the follow-up period is at least five years.[4] Thus, only those individuals who had their last conviction registered in or before 1997 are eligible to be regarded as having terminated their criminal career.[5] *Age at last conviction* was defined as the individual's age at the time of his last known conviction during the follow-up period. Note that the age of termination and the age of last conviction may differ: all individuals who participated have an age of last known conviction, but not all individuals have terminated their criminal careers within the follow-up period of this study. Finally, following prior research (Farrington et al., 1998; Piquero et al., 2004), *career duration* or career length was defined as the number of years between the individual's first and last known conviction – thus including possible periods of incarceration.

3. Years in which offenders were incarcerated for more than six months constituted 1.6% of all person-years in the 1977–2002-period and 1.6% of all-person years in the dataset on the entire criminal careers.

3.3 Individual characteristics (in 1977)

Information on several individual characteristics was obtained from the police files pertaining to the 1977-offence (see also: Werff, 1986). Police files provided information on the sex of the offender and on his or hers country of origin. Women comprised 9.7% of the sample, while 13.3% of the offenders in the CCLS-sample was born outside the Netherlands. Police files also indicated whether an individual was perceived as being alcohol or drug dependent in 1977. In 1977 34.2% of the offenders was indicated as being alcohol- and 2.0% as drug-dependent. Based on the conviction histories derived from the GDF-abstracts individuals were categorized as either showing an early onset or a late onset of their conviction trajectory. For this study, early onset was defined as being convicted prior to age 16. Of all offenders in the sample 16.1% was categorized as early onset-offenders. GDF-abstracts also provided information on the type of offence that got individuals in the sample. Over 38.1% of the offenders was sampled on a property offence, 10.2% on a violent offence, and 11.5% for vandalism or a public order offence. In addition, 27.7% was sampled on a traffic offence, with the remainder of offenders distributed across the other, less frequent categories.

3.4 Method

Given that our main aim is to, for the first time in the Netherlands, portray: (1) long-term participation in crime, (2) frequency of offending, (3) crime-type mix, (4 and 5) onset and termination of offending, and (6) career duration for a representative sample of Dutch offenders, our analysis are descriptive in nature. First, we focus on the long-term patterns of recidivism in the sample, describing recidivism prevalence, frequency and type, as well as the termination of offending. Next, we focus on the entire criminal careers of the sampled individuals preceding the year 2002, again describing participation, frequency and crime mix. In addition, attention is paid to age of onset and career duration. Given the aim and nature of this chapter, bivariate comparisons are used to assess the associations between individual characteristics and the various career dimensions. We are aware that results may differ when multivariate techniques are used. For reasons of accessibility we present details on the multivariate methods and their results in the appendix to this article. In the remainder of this article we limit our discussion of the bivariate comparisons to those differences that remain significant when analyzed in a multivariate model.

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4. Termination commonly is defined as the time when the criminal or delinquent behavior stops *permanently* (Weitekamp & Kerner, 1994, italics added). Strictly speaking therefore, one can only ascertain if an offender has permanently ceased offending, and is not showing a temporary lull followed by continued criminal behavior, when he or she has died (Piquero et al., 2003). Since most studies entail a cut-off of observations at a specific age rather than at death, the length of the follow-up period is crucial. Prior criminological studies have used follow-up periods ranging from 6 months to a year or two (Laub & Sampson, 2001). Research on alcohol treatment however has shown that extending the period of abstinence from two to five years reduces post-termination relapse from 45 to 9% (Vaillant, 1996). Recognizing the problematic aspects of defining and measuring termination of offending (Laub & Sampson, 2001), we opted for a crime free period of five years, which exceeds the follow-up period in criminological studies but is more in line with the stricter standards applied in other disciplines (Vaillant, 1996).
5. As with the analyses on recidivism, both incarceration and mortality were accounted for in determining the minimum crime free period.

4 Recidivism in the 1977–2002 period

In this paragraph we describe the patterns of offending of the 5,164 individuals in the CCLS-sample in the 25-year period from 1977 to 2002[6] on the basis of the distinguished career dimensions. Two of the career dimensions, namely age of onset and career duration, will be left aside since they can only be meaningfully applied to the offenders' entire careers.

Participation

How many individuals continue to participate in crime in the period following their 1977-registration? Or, in other words, what is the prevalence of recidivism in the CCLS-sample? Out of the 5,164 individuals in the sample, 3,380 (65.4%) were found to recidivate with at least one offence sometime during the 25-year follow-up of the study. For the remaining 1,784 (34.6%) individuals, the 1977-offence was also their last known offence. Figure 1 depicts both the hazard and rate of recidivism during the 25-year period between 1977 and 2002. The recidivism hazard – the chance of being convicted for those who had not yet attained an additional conviction since 1977 – was largest the year following the sample offence and declined rapidly as time proceeded. In other words, the chances of being reconvicted decline with the number of years one has been without conviction. Over one third of all offenders was found to recidivate within three years after the 1977-offence, while 57% did so within ten years (Table 1). The average speed of recidivism – the mean number of years between the 1977-offence and the first subsequent conviction – was 4.3 years.

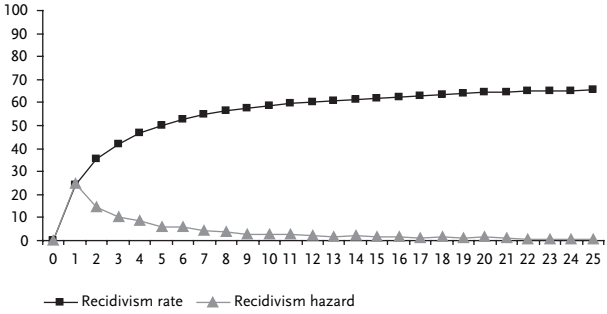
Table 1 Recidivism speed in years (1977-2002)

	% individuals	
# years	recidivating	N
1	24.2	1,250
2	11.1	572
3-4	11.3	584
5-9	10.8	556
10-14	4.2	215
15-25	3.9	202
subtotal[1]	65.4	3,380
no recidivism	34.6	1,784
total	100.0	5,164

1 mean (s.d.) recidivism speed: 4.3 (4.8) years

6. In some cases the year of registration of an offence differs from the year of disposition of the criminal case, for example cases being first registered in 1976 but the court's decision on the case made not until 1977. The sample however was based on all cases tried in 1977. For all individual criminal histories to be comparable we limited the follow-up period for all individuals to 25 years. The means that for example, for cases first registered in 1976 the follow-up was terminated in 2001. For sake of readability we refer to this 25 year period as the 1977–2002-period.

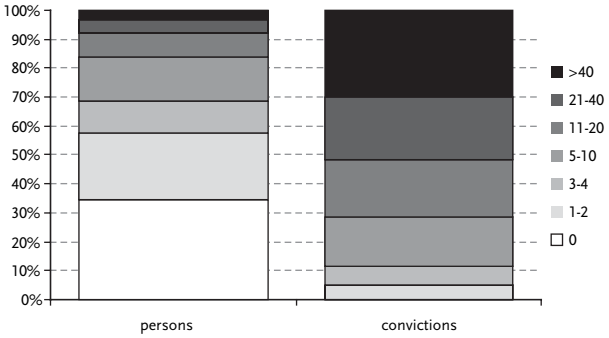
Figure 1 Recidivism rate and hazard over 25 years (1977-2002)



Frequency

The average recidivist in the CCLS-sample is convicted for 9.4 subsequent offences during the 25 year follow-up period.[7] Offence frequency however is not equally distributed among offenders, with many offenders convicted only once or twice, and few offenders convicted many times. Figure 2 and Table 2 show that while 34.6% of the sample did not recidivate, 23.0% did so only with one or two offences. These recidivists only have a minor share (5.3%) in the total number of convictions for the sample in the 1977–2002-period. A small percentage of all persons – 3.0% – however, is accountable for 30.0% of the total number of convictions, with these individuals each being convicted for over 40 offences. The distribution becomes slightly less skewed when only criminal law convictions are considered and convictions for traffic crimes and special law violations are excluded. Of all criminal law convictions 26.3% can be attributed to 3.7% of all individuals in the CCLS-sample (not shown).

Figure 2 Distribution of recidivism frequency (1977-2002)



7. The analyses of recidivism frequency pertain only to those individuals who actually did recidivate at least once during the follow-up period. Since analyzing termination for individuals who did not recidivate during the follow-up period would amount to re-analyzing their period of possible recidivism, the analyses of termination were, like those of recidivism frequency, limited to those individuals who actually were convicted at least once more in the years between 1977 and 2002.

Table 2 Recidivism frequency distribution (1977-2002)

	Number of convictions 25 years following 1977-offence				
	# ind.	% ind.	# conv. per ind.	# conv.	% conv.
participation	1,784	34.6	*0*	0	0
	3,380	65.4	*1–∞*	31,788	100.0
total	5,164	100.0		31,788	100.0
frequency[1]	1,784	34.6	*0*	0	0
	1,190	23.0	*1-2*	1,672	5.3
	582	11.3	*3-4*	2,017	6.3
	778	15.1	*5-10*	5,446	17.1
	430	8.3	*11-20*	6,200	19.5
	244	4.7	*21-40*	6,905	21.7
	156	3.0	*>40*	9,548	30.0
total	5,164	100.0		31,788	100.0

1 mean (s.d.) recidivism frequency: 9.4 (14.4)

Crime mix

Most of the total number of 31,788 offences the 3,380 recidivists in the sample were convicted for were property offences. Table 3 shows that 42.4% of all convictions pertained to property offences; the average recidivist being convicted for 4 property offences in the 1977–2002-period. Traffic offences constitute 17.3% of all offences, while violent, damaging/public order and non-penal law offences each make up about one tenth each.

Table 3 Recidivism frequency by type of crime (1977-2002)

	# crimes	**% crimes**	**rec freq**
violent	3,324	10.5	1.0
property	13,464	42.4	4.0
damage	3,041	9.6	0.9
drugs	1,549	4.9	0.5
guns	917	2.9	0.3
other criminal law	236	0.7	0.1
traffic	5,494	17.3	1.6
other special laws	3,763	11.8	1.1
total	31,788	100.0	9.4

Table 4 shows the number of individuals showing a particular crime mix and their share in the total number of (penal law) convictions in the 1977–2002-period. The first column of this table shows that almost half (47.3%) of the recidivists have not been convicted for any violent offence during the follow-up period, 40.2% has been convicted for a violent offence between 1 and 4 times, and 12.5% has been convicted for 5 violent offences or more. The second column provides similar information for property offences. The third column indicates whether there were any other penal law convictions during the 1977–2002-period. Each row in the table thus gives the number of individuals showing a certain crime mix, and their share in both the number of penal law offences as well as the

total number of offences. The first row for example shows those offenders who were convicted solely for special law offences, mostly traffic offences. Their share in the total number of crimes and the average recidivism frequency for this type of offenders also shows that many of these offenders were only convicted once or twice during the 1977–2002-period. Two main conclusions can be drawn from this table. One is that all distinguished combinations are present in the offender population; no combination of crime types seems to really 'stick out'. Second, versatility seems to increase with offending frequency; 'pure' violent or 'pure' property offenders are rare among those scoring 'many' on either violent or property offences.

Table 4 Number of individuals and their share in the total number of crimes by crime mix

	violent	property	other crim. law	# ind.	# crim. law offences	# traffic offences	# special law off.	# offences total	recidivsm frequency
# offences[1]	none	none	no	735	0	1,121	507	1,628	2.2
	none	none	yes	133	219	131	102	452	3.4
	none	few	no	501	772	449	293	1,514	3.0
	none	few	yes	83	320	125	52	497	6.0
	none	many	no	78	670	39	30	739	9.5
	none	many	yes	66	1,117	77	65	1,260	19.0
	few	none	no	433	675	427	304	1,407	3.2
	few	none	yes	94	320	134	86	541	5.8
	few	few	no	362	1,338	497	346	2,181	6.0
	few	few	yes	161	1,038	393	190	1,620	10.0
	few	many	no	128	1,543	267	164	1,973	15.4
	few	many	yes	180	3,996	406	450	4,852	26.9
	many	none	no	29	186	61	18	265	9.1
	many	none	yes	19	195	15	12	222	11.7
	many	few	no	55	482	106	83	671	12.3
	many	few	yes	64	869	253	122	1,243	19.4
	many	many	no	65	1,666	198	214	2,078	32.0
	many	many	yes	191	7,126	796	724	8,646	45.2
total				3,380	22,531	5,494	3,763	31,788	9.4

1 for violent and property offences: none = 0; few = 1-4; many > 4. For other criminal law offences: no = 0, yes > 0.

Age of termination

Of the 3,380 recidivists in the sample, 2,218 (65.5%) terminate their criminal career within the 25 years following their 1977-offence (Table 5). This leaves 34.5% to be considered still criminally active. For this study the crime free period for someone to be considered as having terminated his or her criminal career was fixed at a minimum of five years. This means that offenders who were convicted in the last five years of the follow-up period (1997–2002) all are regarded as continuing their criminal careers.

Analogous to Figure 1, Figure 3 shows the termination hazard and rate of the recidivists in the sample. Unlike the curve for recidivism hazard, that for termination hazard does not show a decline with time, but remains constantly low during the entire follow-up period. In other words, the chances of terminating ones criminal career do not de- of increase with the number of years since the 1977-offence. Of those who terminate their criminal career, 17.5% does so during the nine years following the 1977-offence (Table 5).

Figure 3 Termination rate and hazard over 25 years (1977-2002)

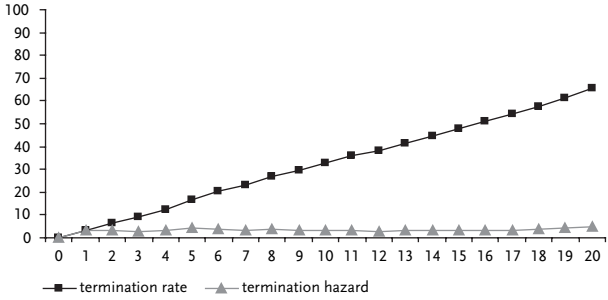


Table 5 Termination speed in years (1977-2002)

# years	% recidivists terminating	N
2	3.2	107
3-4	6.1	206
5-9	17.5	592
10-14	15.0	507
15-21	23.9	806
subtotal[1]	65.6	2,218
no termination	34.4	1,162
total	100.0	3,380

1 mean (s.d.) termination speed: 11.6 (5.9)

As previous studies have shown (e.g. Farrington et al., 1998), the average age of termination depends on the average age to which individuals are followed-up. The prospective period on which data was gathered in the CCLS was 25 years for all offenders. However, in the CCLS the age to which offenders were followed-up is conditional on the individual's age in 1977. Table 6 shows the age at termination by age in 1977. As anticipated, both prevalence and mean age of termination were positively associated with offender's age in 1977; offenders who were young in 1977 terminating less, but at earlier ages. After 25 years 56.2% of those aged 10–14 in 1977 has terminated their criminal careers; the peak age of termination lying between 25 and 34. On the other hand, 43.8% of those aged 10–14 are thus still criminally active after 25 years. Of those aged 45 or older 23.7% is even considered still criminally active by age 70.

Table 6 Age at termination (1977-2002) by age in 1977

		% recidivists terminating at age						%	total	mean age at termination	
		10-14	15-19	20-24	25-4	35-44	>44	no term			
										mean	s.d.
age in 1977	10-14	0.0	6.7	20.2	28.1	1.1	0.0	43.8	100.0	25.8	5.7
	15-19	0.0	1.6	17.5	28.3	16.4	0.0	36.1	100.0	29.0	6.1
	20-24	0.0	0.0	3.2	27.7	27.6	0.2	41.2	100.0	33.5	6.1
	25-34	0.0	0.0	0.0	11.6	32.9	23.4	32.1	100.0	41.1	6.4
	35-44	0.0	0.0	0.0	0.0	13.7	60.4	25.9	100.0	50.3	6.4
	>44	0.0	0.0	0.0	0.0	0.0	76.3	23.7	100.0	58.6	5.7
total		0.0	0.6	5.9	18.1	22.1	18.9	34.4	100.0	38.6	10.9

5 Criminal careers over the entire life course

We now go on to describe the entire criminal histories of the individuals in the sample in light of the aforementioned career dimensions. Given that the age distribution of the CCLS-sample is broad and the follow-up age has proven to be relevant for the obtained results, findings on each career dimension will be presented by age in 1977 whenever relevant. Since no information is available on the age on which those of non-Dutch origin came to reside in the Netherlands, and no reliable data on their criminal records in their countries of origin could be obtained, all individuals of foreign birth (N=685) were excluded for this part of the analysis, leaving a sample of 4,473 Dutch-born individuals.

Participation and frequency

Ever-participation in the CCLS-sample was high, namely 96.1%. This is not surprising since the sampling procedure was based on all cases being tried in 1977.[8] The 4,303 individuals in the CCLS-sample that were found to participate in crime were convicted for a total number of 45,586 offences during their entire criminal careers preceding 2002 (see Table 7). The average criminal career consisted of 10.6 offences. If we exclude the 1977-offence, participation drops to 79.4% (N=3,557). The average offence frequency increases to 11.7, since excluding the 1977-offence results in decreasing the number of one-time offenders. The total number of convictions excluding the 1977-offence, was 41,794. As with recidivism frequency, the distribution of frequency of offending over the entire career was highly skewed (Figure 4). Including the 1977-offence 31.1% of all individuals in the sample were convicted only once or twice, their convictions constituting 4.3% of the total. On the other extreme, 4.9% of all individuals were convicted over 40 times each, their convictions making up more than six times their fair share (30.5%) of the total number of convictions. Excluding the 1977-offence yields similar results (Table 7).[9]

8. Ever-participation does not reach 100% since for a small number of individuals the 1977-offence did not result in either a conviction or a policy waiver. If these individuals were not convicted in any other year preceding 2002, they were considered 'non-participants'.
9. The difference between the total number of convictions with and without 1977-offence does not equal 4303 because the 1977-offence did not amount in a conviction for all participants.

Figure 4 Distribution of offending frequency based on entire careers (Dutch-born offenders)

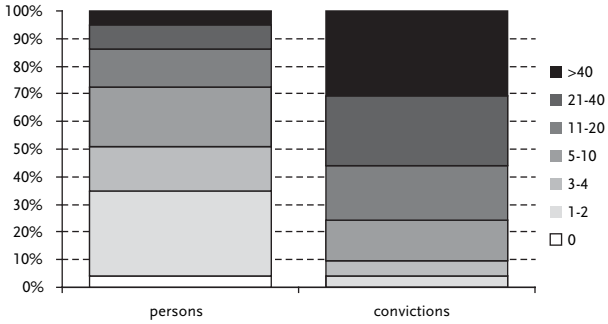


Table 7 Offence frequency distribution entire career (Dutch-born offenders)

	Number of convictions in the entire career				
	including the 1977-offence				
	# ind.	% ind.	# conv. per ind.	# conv.	% conv.
participation	176	3.9	0	0	0
	4,303	96.1	*1–∞*	45,586	100
total	4,479	100.0		45,586	100
frequency[1]	176	3.9	*0*	0	0
	1,394	31.1	*1-2*	1,970	4.3
	710	15.9	*3-4*	2,428	5.3
	961	21.5	*5-10*	6,713	14.7
	612	13.7	*11-20*	8,913	19.6
	408	9.1	*21-40*	11,639	25.5
	218	4.9	*>40*	13,922	30.5
total	4,479	100.0		45,586	100.0
	excluding the 1977-offence				
	# ind.	% ind.	# conv. per ind.	# conv.	% conv.
participation	922	20.6	*0*	0	0
	3,557	79.4	*1-∞*	41,795	100
total	4,479	100.0		41,795	100.0
frequency[2]	922	20.6	*0*	0	0
	1,033	23.1	*1-2*	1,477	3.5
	536	12.0	*3-4*	1,860	4.4
	838	18.7	*5-10*	5,908	14.1
	554	12.4	*11-20*	8,094	19.4
	382	8.5	*21-40*	10,832	25.9
	215	4.8	*>40*	13,624	32.6
total	4,479	100.0		41,795	100.0

1 mean (s.d.) offence frequency: 10.6 (15.5) for those who were convicted
2 mean (s.d) offence frequency: 11.7 (16.4) for those who were convicted

Crime mix

Up to 2002, the individuals in the CCLS-sample were convicted for a total number of 45,586 offences, including their 1977-offence. The most frequent conviction was that for property offences, followed by traffic offences, the average offender being convicted for 4–5 property offences and 2 traffic offences (Table 8). Excluding the 1977-offence decreases the percentage of traffic offences from 18.6% to 17.2% indicating that for many individuals whose inclusion in the sample was based on a traffic offence, the 1977-offence was their only conviction.

Table 8 Number of individuals and their share in the total number of crimes by crime mix

	violent	property	other crim. law	# ind.	# crim. law offences	# traffic offences	# special law off.	# offences total	recidivsm frequency
# offences[1]	none	none	no	774	0	1,305	395	1,700	2.2
	none	none	yes	97	132	72	52	257	2.7
	none	few	no	784	1,280	703	238	2,221	2.8
	none	few	yes	98	351	143	77	571	5.8
	none	many	no	102	954	130	89	1,173	11.5
	none	many	yes	56	943	93	85	1,121	20.0
	few	none	no	444	679	513	206	1,397	3.1
	few	none	yes	73	247	115	78	440	6.0
	few	few	no	579	2,154	934	505	3,593	6.2
	few	few	yes	150	884	376	207	1,466	9.8
	few	many	no	232	3,020	520	334	3,873	16.7
	few	many	yes	263	5,623	892	625	7,140	27.1
	many	none	no	39	303	86	29	418	10.6
	many	none	yes	12	114	30	11	154	13.0
	many	few	no	97	899	279	128	1,306	13.5
	many	few	yes	74	1,044	221	116	1,381	18.8
	many	many	no	150	3,424	458	418	4,300	28.7
	many	many	yes	279	10,254	1,606	1,215	13,075	46.9
total				4,303	32,304	8,475	4,807	45,586	10.6

1 for violent and property offences: none = 0; few = 1-4; many > 4. For other criminal law offences: no = 0, yes > 0.

Analogous to Table 4, Table 8 shows the distribution of crime mix across individuals as well as the total share in both penal and non-penal law convictions individuals with a certain crime mix are responsible for. Table 8 shows that offending frequency and versatility of offending often come together. Again Table 9 shows that a small number of individuals – committing both violent and property offences – is responsible for a disproportionate share of the total number of convictions recorded for the offenders in the CCLS-sample.

Table 9 Offence frequency (entire career) by type of crime

	includ. 1977-offence[1]			exclud. 1977-offence[2]		
	# crimes	**% crimes**	**rec freq**	**# crimes**	**% crimes**	**rec freq**
violent	4,797	10.5	1.1	4,454	10.7	1.3
property	20,147	44.2	4.7	18,782	44.9	5.3
damage	4,744	10.4	1.1	4,344	10.4	1.2
drugs	1,072	2.4	0.2	1,024	2.5	0.3
guns	1,199	2.6	0.3	1,103	2.6	0.3
other criminal law	347	0.8	0.1	321	0.8	0.1
traffic	8,475	18.6	2.0	7,196	17.2	2.0
other special laws	4,807	10.5	1.1	4,571	10.9	1.3
total	45,586	100.0	10.6	41,795	100.0	11.7

1 (N=4,303 persons)

2 (N=3,557 persons)

Age of onset

The average offender in the CCLS starts his criminal career when he or she is 20–21. The peak age of onset however is younger, and falls between ages 15–19. About one in ten offenders started their criminal careers between ages 10–14 (Table 10). Contrary to the much-aired opinion that crime is part of the sins of youth, 16.4% of the 4,303 individuals in our sample that participated in crime experienced the onset of their criminal career between ages 25–34. A small percentage of individuals (4.8%) were convicted only after age 44. However, more detailed analysis showed that over half of these offenders were once-and-only offenders.

Table 10 Onset age distribution (N=4,303)

onset age[1]	%	# ind
10-14	10.8	464
15-19	40.7	1,750
20-24	20.3	875
25-34	16.4	706
35-44	7.0	302
> 44	4.8	206
total	100.0	4,303

1 mean (s.d.) onset age: 22.6 (9.5)

Age of last conviction

The maximum age of last conviction is conditional on the individual's age in 1977. Table 11 therefore presents the age of last conviction by age in 1977. The mean age of last conviction for those aged 10–14 in 1977 is 26.5. This means that this group in 1977 had an average residual career length of 13–17 years. The residual career length drops with age in 1977. Individuals between ages 35–44 have an average residual career length of 3–12 years.

Note that the age of last conviction does not imply a minimum crime-free period as did the age of termination, but refers simply to the last known offence. In addition, age of termination referred only to those offenders who were convicted at least once during the 1977–2002 period. Every individual who participated thus has an age of last known conviction, even the offenders who were not considered to have terminated their criminal careers. This explains why many (20.6%) of the individuals aged 10–14 in 1977 can have their last known conviction while aged 10–14, despite of the fact no one *terminated* their criminal career during that age period: these individuals are one-time offenders.[10] The small percentages of individuals mentioned in the lower left-hand side of the table below the diagonal are explained by the fact that for some of the individuals in the sample the 1977-offence did not result in a conviction. The age of last conviction may therefore be younger than that in 1977.

Table 11 Age of last conviction (entire career) by age in 1977 (N = 4,303)

		age of last conviction							mean age	
		10-14	15-19	20-24	25-34	35-44	45+	total	last conv.	s.d.
age in 1977	10-14	20.6	11.2	14.0	19.6	34.6	0.0	100.0	26.5	9.5
	15-19	0.1	26.2	15.2	23.4	35.0	0.0	100.0	28.7	9.3
	20-24	0.0	0.9	30.0	23.2	31.5	14.4	100.0	32.8	9.4
	25-34	0.1	0.2	0.8	39.8	26.2	33.0	100.0	38.9	9.5
	35-44	0.2	0.2	0.3	0.7	47.9	50.7	100.0	46.9	8.9
	> 44	0.0	0.2	0.2	0.9	3.1	95.6	100.0	53.8	7.9
total		0.6	6.9	10.8	22.2	30.3	29.2	100.0	37.5	12.3

Duration

The average criminal career in our sample had a duration of 20.0 years, excluding one-time offenders. Table 12 shows the distribution of career length across the participants in the sample. Over one fifth of the participants (21.8%) is convicted only once during his or her career. Careers of short duration are relatively rare, as are extremely long careers. Table 13 shows career duration to increase as the maximum age to which individuals were followed up increases. Excluding one-time offenders, the mean career duration ranged from 15.3 to 26.5 depending on the age in 1977 category. Table 13 also reveals that individuals that were older in 1977 were more likely to be persistent offenders. While 24.5% (4.7%+19.8%) of the offenders aged 10–14 in 1977 was found to have a criminal career duration between 2 to 9 years, only 10.4% of the offenders aged 35–44 and 10.4% of the offenders aged over 44 in 1977 did. 14.0% of those over 44 in 1977 had criminal careers that spanned 40 years or more.

10. Another, less common reason is that while their last known offence was between 10–14, some of these 20.6% did not experience the minimum required five year crime free period before the end of the follow-up. This may either be because they were incarcerated for the remainder of the follow-up, or because they died within five years after their last known offence.

Table 12 Career duration in years (entire career)

# years[1]	% ind.	N
1	21.8	938
2-4	6.2	269
5-9	10.7	462
10-19	19.8	853
20-29	26.7	1,148
30-39	10.8	463
40+	4.0	170
total	100.0	4,303

1 mean (s.d.) duration excluding one-time offenders: 20.0 (11.1)

Table 13 Career duration by age in 1977

		career duration (in years)								mean	
		1	**2-4**	**5-9**	**10-19**	**20-29**	**30-39**	**40+**	**total**	**duration[1]**	**s.d.**
age in 1977	10-14	21.7	4.7	19.8	17.0	36.8	0.0	0.0	100.0	16.5	7.9
	15-19	21.3	7.4	14.8	23.3	31.7	1.4	0.0	100.0	16.2	8.4
	20-24	19.2	7.0	13.2	22.3	29.7	8.7	0.0	100.0	17.9	9.3
	25-34	20.1	6.2	8.9	19.9	24.8	16.8	3.2	100.0	20.9	10.9
	35-44	23.0	4.3	6.1	18.4	22.4	14.5	11.3	100.0	24.2	12.4
	> 44	31.0	5.1	5.3	8.9	17.1	18.6	14.0	100.0	27.4	14.0
total		21.8	6.3	10.7	19.8	26.7	10.8	3.9	100.0	20.0	11.1

1 excluding one-time offenders

Frequency while active

A low average offence frequency computed over age does not rule out the possibility of some offenders showing short but highly active criminal careers. Computing lambda based on the years between the first and last known conviction is more informative in this respect. In Table 14 we present the offence frequency while active by criminal career duration. Table 14 shows that duration is positively associated with offence frequency; those with longer criminal careers being convicted at a higher rate. Table 15 once more shows frequency while active by career duration but now the percentages are in columns. The percentages on the diagonal again show the positive association between duration and offence frequency. Percentages in the upper right hand side of the table show some very frequent offenders to have relatively short criminal careers. Percentages in the lower left side of the table pertain to offenders showing long periods of intermittency between convictions.

Table 14 Frequency while active by duration (percentages in rows)

		frequency while active								mean	
		1	2-3	4-9	10-19	20-29	30-49	50+	total	freq.	s.d.
duration (in years)	1	87.2	12.4	0.4	0.0	0.0	0.0	0.0	100.0	1.2	0.4
	2-4	0.0	79.6	20.4	0.0	0.0	0.0	0.0	100.0	2.9	1.4
	5-9	0.0	52.9	40.2	6.5	0.4	0.0	0.0	100.0	4.5	3.3
	10-19	0.0	29.2	44.6	19.5	4.5	2.1	0.1	100.0	7.9	7.2
	20-29	0.0	11.3	34.2	27.0	11.8	8.3	7.3	100.0	16.9	17.4
	30-39	0.0	6.0	23.1	25.7	19.4	13.2	12.5	100.0	23.7	21.7
	40+	0.0	4.1	22.2	29.2	13.5	15.8	15.2	100.0	26.7	28.1
total		19.0	23.0	27.0	15.7	6.7	4.7	3.9	100.0	10.6	15.5

Table 15 Frequency while active by duration (percentages in columns)

		frequency while active						
		1	2-3	4-9	10-19	20-29	30-49	50+
duration (in years)	1	100	11.7	0.3	0.0	0.0	0.0	0.0
	2-4	0	21.6	4.7	0.0	0.0	0.0	0.0
	5-9	0	24.8	16.0	4.4	0.7	0.0	0.0
	10-19	0	25.2	32.7	24.6	13.1	9.0	0.6
	20-29	0	13.1	33.8	45.9	47.1	47.3	49.7
	30-39	0	2.8	9.2	17.6	31.1	30.3	34.3
	40+	0	0.7	3.3	7.4	8.0	13.4	15.4
total		100.0	100.0	100.0	100.0	100.0	100.0	100.0

6 Variation in career dimensions across individuals

Previous research has shown criminal careers to differ between individuals. In this section we briefly address between-individual variation in criminal career dimensions with regard to characteristics that have shown substantial effects and which are available in the CCLS. Below we present tables of bivariate comparisons. Results from the multivariate models are in the appendices. We limit the discussion of the bivariate results to those that remain significant within the multivariate models. Bivariate comparisons are given in Tables 16 thru 19.

Men were twice as likely to recidivate as women (Table 16). Twenty-five years after the 1977 offence 68.3% of the men had been convicted at least for one subsequent offence, compared to 38.5% of the women. Men also recidivate faster and more often: the individual offence frequency for men being almost twice that of women. Compared to men, women seemed to be less versatile in their offending and more specialized in property offences (69.2% versus 41.2% of the total number of offences between 1977 and 2002) (see Table 17). While more women (75.3%) than men (65.0%) were found to have terminated their criminal career within the 1977–2002-period, the average speed of termination was remarkably similar. The average age of termination was 41.1 for women, compared to 38.4 for men. Ever-participation was highest among men (Table 18). Comparing ever-participation with and without the 1977-offence revealed that many women are one-time offenders. Women's participation dropped from 87.5% to 52.8% once the

1977-offence was excluded, compared to 96.9% versus 82.1% in men. Women tended to start their criminal careers at a later age than men. The average age of onset for women was 29.9 compared to 21.9 for men. Because of this late onset and despite terminating at a later age, the average criminal career for women – excluding one-time offenders – has a duration of 16.6 years, which is 3.6 years shorter than that of men.

Offenders of non-Dutch origin did not differ greatly from Dutch offenders in either recidivism prevalence or frequency (Table 16). Non-Dutch offenders however, did seem to specialize more in property and drug offences than did Dutch offenders; property and drug offences respectively making up 48.8% and 13.7% of the total number of convictions following the 1977-offence for non-Dutch offenders, compared to 41.2% and 3.3% for Dutch offenders (Table 17). Dutch and non-Dutch offenders were as likely to terminate their criminal career within the follow-up period. The mean termination age for non-Dutch offenders was 39.5 compared to 38.4 for Dutch-offenders. Given we did not obtain information on possible criminal records in the country of origin we did not include non-Dutch offenders in our analysis of the entire criminal careers of the CCLS-sample.

Based on police-file information pertaining to the 1977-offence, comparisons were made between those offenders classified as either alcohol or drug dependent, and those classified as non-dependent. Recidivism prevalence was highest (81.8%) among those offenders classified as drug dependent in 1977 (Table 16). These offenders also showed the highest recidivism frequency (10.8), while that of those classified as alcohol dependent was lowest (7.3). No differences were found in termination prevalence or speed. Alcohol-dependent offenders had the longest career duration. Offence frequency over the entire career was highest for drug-dependent offenders, their average career consisted of 14.3 offences, compared to 10.5 for offenders not classified as drug dependent (Table 18). Drug dependent offenders also showed a mean age of onset that was more than two years below that of non-drug dependent offenders. However, on average drug dependent offenders seemed not to offend more frequently during their active years.

Recidivism prevalence was highest in early onset offenders. 82.2% was convicted in the 25 year period following their 1977-offence, compared to 52.3% of those first convicted after age 16 (Table 16). Both recidivism speed and recidivism frequency were found to show a strong inverse relationship with age of onset. Analysis of offence frequency over the entire criminal career yielded similar results (Table 18). Offenders first convicted before age 16 had an average conviction frequency of 19.9, compared to 8.5 for those first convicted between after age 16. Early onset did not seem to influence crime mix (Tables 17 and 19). Age of onset also proved to be inversely related to career duration (Table 18). The average career duration for offenders with an early onset was 24.4 years, while that of offenders with a late onset was 18.8.

The type of 1977-offence proved to be related to recidivism prevalence; those sampled on a 'other-criminal-law' offence having the lowest prevalence (39.3%), those sampled on a drug offence the highest (77.9%) (Table 16). Recidivism speed was lowest and recidivism frequency highest among those sampled on drug or property offences. Age of onset was highest for those sampled on a traffic offence (Table 18). Offence frequency while active was found highest among those sampled on a drug offence.

Table 16 Recidivism and termination in the 25-year period following the 1977-offence

	recidivism prevalence	recidivism speed		recidivism frequency		lambda (#/year)		termination prevalence	termination speed		termination age	
	%	mean	s.d.	mean	s.d.	mean	s.d.	%	mean	s.d.	mean	s.d.
Total	65.4	4.3	4.8	9.4	14.4	0.4	0.6	65.6	11.6	5.9	38.6	10.9
Personal characteristics												
Sex												
male	68.3	4.1	4.7	9.6	14.6	0.4	0.6	65.0	11.7	5.9	38.4	10.9
female	38.5	6.7	6.3	5.2	8.3	0.2	0.3	75.3	11.4	6.2	41.1	10.7
Country of origin												
Dutch	65.7	4.3	4.8	9.1	13.7	0.4	0.6	65.7	11.7	5.9	38.4	11.1
non-Dutch	64.0	4.0	4.8	11.2	18.0	0.5	0.7	65.0	11.5	6.0	39.5	9.8
Dependency indication												
alcohol: no	63.5	4.2	5.0	10.6	15.6	0.5	0.7	64.0	11.9	6.0	37.5	11.0
alcohol: yes	69.3	4.3	4.5	7.3	11.7	0.3	0.5	68.6	11.2	5.8	40.4	10.5
drugs: no	65.1	4.3	4.8	9.3	14.4	0.4	0.6	65.7	11.6	5.9	38.6	11.0
drugs: yes	81.8	4.0	5.0	10.8	12.3	0.5	0.6	65.3	12.2	5.9	38.1	10.3
Offending characteristics												
Age of onset												
early onset (prior to age 16)	82.2	3.1	3.8	14.6	19.0	0.6	0.8	57.2	12.4	5.7	35.4	11.2
late onset (age 16 or later)	62.3	4.5	5.0	8.1	12.6	0.3	0.5	67.8	11.5	5.9	39.2	10.7
Type of offence in 1977[1]												
violent	63.4	4.4	5.1	8.9	11.3	0.4	0.5	65.3	12.2	5.9	38.1	10.3
property	68.8	3.9	4.6	11.8	17.1	0.5	0.7	61.6	11.9	5.9	36.3	11.1
damaging/public order	70.3	4.0	4.7	9.3	14.7	0.4	0.6	65.8	11.3	5.9	36.0	9.7
drugs	77.9	3.3	3.8	11.9	13.9	0.5	0.6	64.1	12.1	6.0	37.8	8.4
other criminal law	39.3	7.4	7.0	8.4	14.8	0.3	0.6	54.1	9.5	5.5	36.1	12.6
traffic	60.4	4.7	4.8	6.2	10.2	0.3	0.4	71.0	11.1	5.9	42.1	10.5
other special laws	60.3	5.1	5.7	7.2	11.4	0.3	0.5	70.9	11.9	5.7	42.4	10.7

1 No individuals were sampled on a offence primarily based on a (fire)arms-violation

Table 17 Recidivism frequency and crime mix in the 25-year period following the 1977-offence

	Total	Violence	Property	Damaging	Drugs	Guns	Other crim. law	Traffic	Other special law
Total	9.4	1.0	4.0	0.9	0.5	0.3	0.1	1.6	1.1
Personal characteristics									
Sex									
male	9.7	1.0	4.0	0.9	0.5	0.3	0.1	1.7	1.2
female	5.2	0.3	3.6	0.3	0.3	0.0	0.0	0.3	0.3
Country of origin									
Dutch	9.1	1.0	3.8	0.9	0.3	0.3	0.1	1.7	1.1
non-Dutch	11.2	1.2	5.5	0.7	1.5	0.3	0.1	1.0	0.9
Dependency indication									
alcohol: no	10.6	1.1	5.1	0.9	0.6	0.3	0.1	1.4	1.1
alcohol: yes	7.3	0.7	2.1	0.8	0.2	0.2	0.0	2.1	1.2
drugs: no	9.3	1.0	3.9	0.9	0.4	0.3	0.1	1.6	1.1
drugs: yes	10.8	0.9	5.6	0.9	1.3	0.2	0.1	0.9	0.9
Offending characteristics									
Age of onset									
early onset (prior to age 16)	14.6	1.6	7.0	1.5	0.5	0.4	0.1	2.0	1.5
late onset (age 16 or later)	8.1	0.8	3.2	0.7	0.5	0.2	0.1	1.5	1.0
Type of offence in 1977[1]									
violent	8.9	1.5	2.9	1.0	0.5	0.4	0.1	1.4	1.1
property	11.8	1.2	6.2	1.0	0.6	0.3	0.1	1.4	1.1
damaging/public order	9.3	1.2	3.2	1.6	0.3	0.3	0.1	1.6	1.1
drugs	11.9	0.8	6.0	0.6	2.6	0.3	0.1	0.8	0.7
other criminal law	8.4	0.6	3.7	0.6	0.6	0.3	0.1	1.5	1.0
traffic	6.2	0.5	1.5	0.5	0.1	0.2	0.0	2.2	1.1
other special laws	7.2	0.6	2.5	0.5	0.4	0.3	0.1	1.6	1.3

1 No individuals were sampled on a offence primarily based on a (fire)arms-violation

Table 18 Career dimensions of the entire criminal careers of the CCLS-sample (Dutch-born individuals)

	Partici-pation	Participation excl. 1977-conv.	Frequency[1]		Lambda[1]		Age of onset		Age of last conviction		Duration[2]		Lambda[2] (active years)	
	%	%	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.
Total	96.1	79.4	10.6	15.5	0.2	0.3	22.6	9.5	37.5	12.3	20.0	11.1	0.7	0.6
Personal characteristics														
Sex														
male	96.9	82.1	11.2	16.0	0.2	0.3	21.9	9.0	37.4	12.3	20.2	11.0	0.7	0.6
female	87.5	52.8	3.9	6.4	0.1	0.1	29.9	11.8	38.2	12.5	16.6	10.9	0.5	0.5
Dependency indication														
alcohol: no	94.6	7.6	11.2	16.3	0.2	0.3	22.1	10.0	36.7	12.7	20.1	11.2	0.7	0.6
alcohol: yes	98.8	82.7	9.6	14.2	0.2	0.3	23.5	8.7	38.8	11.5	19.8	10.9	0.6	0.5
drugs: no	96.1	79.2	10.5	15.5	0.2	0.3	22.7	9.6	37.5	12.4	20.0	11.1	0.7	0.6
drugs: yes	97.0	87.8	14.3	15.6	0.3	0.3	18.7	5.0	35.6	9.6	19.7	8.7	0.8	0.6
Offending characteristics														
Age of onset														
early onset (prior to age 16)	99.3	94.6	19.9	22.3	0.4	0.5	13.8	1.4	35.7	12.3	24.4	1.4	0.9	0.7
late onset (age 16 or later)	95.4	76.2	8.5	12.7	0.2	0.3	24.5	9.5	37.9	12.3	18.8	9.5	0.6	0.6
Type of offence in 1977														
violent	93.5	80.4	11.0	14.7	0.2	0.3	21.3	8.3	37.5	12.1	21.0	11.1	0.6	0.5
property	95.8	81.9	13.2	18.1	0.3	0.4	20.5	8.8	36.1	12.8	20.2	11.3	0.8	0.7
damaging/public order	96.7	82.2	11.4	16.5	0.2	0.4	21.1	8.3	35.5	11.5	18.9	10.2	0.7	0.6
drugs	96.8	90.3	15.3	17.1	0.3	0.4	20.1	5.6	36.0	10.1	18.5	10.2	0.9	0.7
other criminal law	92.7	66.0	6.6	15.0	0.1	0.3	28.2	12.8	37.7	11.0	17.5	12.6	0.6	0.6
traffic	97.6	74.7	7.2	11.5	0.1	0.2	25.8	10.2	39.6	11.9	19.7	11.1	0.5	0.5
other special laws	94.7	77.5	8.5	12.0	0.2	0.2	24.7	10.0	39.6	12.3	21.5	11.6	0.6	0.5

1 Only those who participated (were convicted at least once).

2 Only those individuals convicted in at least two different years, and only during their active years.

Table 19 Offence frequency and crime mix in the entire criminal career of the CCLS sample (Dutch-born individuals)

	Total	Violence	Property	Damaging	Drugs	Guns	Other crim. law	Traffic	Other special law
Total	10.6	1.1	4.7	1.1	0.2	0.3	0.1	2.0	1.1
Personal characteristics									
Sex									
male	11.2	1.2	4.9	1.2	0.3	0.3	0.1	2.1	1.2
female	3.9	0.3	2.6	0.3	0.1	0.1	0.1	0.3	0.2
Dependency indication									
alcohol: no	11.2	1.1	5.7	1.1	0.3	0.3	0.1	1.5	1.1
alcohol: yes	9.6	1.1	3.0	1.2	0.1	0.2	0.1	2.8	1.1
drugs: no	10.5	1.1	4.6	1.1	0.2	0.3	0.1	2.0	1.1
drugs: yes	14.3	1.1	7.9	1.2	1.0	0.2	0.1	1.6	1.2
Offending characterisitcs									
Age of onset									
early onset (prior to age 16)	19.9	2.1	10.5	2.0	0.4	0.5	0.1	2.6	1.7
late onset (age 16 or later)	8.5	0.9	3.4	0.9	0.2	0.2	0.1	1.8	1.0
Type of offence in 1977[1]									
violent	11.0	2.7	3.7	1.3	0.2	0.4	0.1	1.5	1.0
property	13.2	1.1	7.7	1.1	0.3	0.3	0.1	1.4	1.2
damaging/public order	11.4	1.4	4.0	2.6	0.2	0.3	0.1	1.7	1.1
drugs	15.3	0.9	8.1	0.7	2.8	0.5	0.1	1.1	1.2
other criminal law	6.6	0.4	2.6	0.6	0.1	0.2	0.7	1.2	0.8
traffic	7.2	0.6	1.9	0.6	0.1	0.1	0.0	3.1	0.9
other special laws	8.5	0.7	2.7	0.6	0.2	0.6	0.1	1.8	1.7

1 No individuals were sampled on a offence primarily based on a (fire)arms-violation

7 Conclusion

This study describes the entire criminal careers of a large representative sample of Dutch offenders on the basis of six distinguished career dimensions: (1) participation, (2) offence frequency, (3) crime mix, (4) age of onset, (5) age of termination, and (6) career duration. Findings were presented on recidivism during the 25 year period between 1977 and 2002 on which data was gathered prospectively for all offenders, as well as on the entire conviction histories prior to the year 2002 of the Dutch-born offenders in the sample.

In the period 1977–2002, 65.4% of all individuals in the sample reoffended. Chances of being reconvicted were highest directly after the 1977-offence. The average recidivist was convicted 9.4 times. In accordance with prior findings (Spelman, 1994), offence frequency was not equally distributed: many offenders recidivated only once or twice, while few offenders were convicted up to forty times or more. These 'vital few' (3.0%) were responsible for ten times their fair share (30.0%) in the total number of convictions for

the sample in the 1977–2002-period. Property offences dominated the mix of crimes committed, with four out of ten known crimes being property crimes. During the 25 years between 1977–2002, 65.5% of the offenders showed a crime-free period of a minimum of five years directly preceding the end of the studies follow-up period and were considered to have terminated their criminal careers. Unlike recidivism, the chance of termination was not related to the number of years since the 1977-offence.

The average offence frequency over the entire criminal career was 10.6. Again, offence frequency distribution was highly skewed, with 4.9% of all individuals being responsible for 30.5% of all convictions. As with recidivism in the 1977–2002-period, property offences made up almost half of the average criminal career. Age of onset, defined here as age of first conviction, was 20–21, with the peak age of onset between ages 15–19. These results concur with the findings of prior studies using official data (Farrington, 2001; Farrington & Maughan, 1999; Tracy et al., 1990). Offenders who start their career later in life are more likely to be one-time offenders. The mean criminal career duration was found to be 20.0 years. Again this is comparable to findings from prior studies with long follow-up periods (Farrington et al., 1998; Piquero et al., 2004).

Participation was highest for men and when active, men offended twice as frequent as women. Women on the other hand seemed to be less versatile in their offending than were men and specialized more in property offences. During the 1977–2002 period offenders of non-Dutch origin specialized more in drug offences. Recidivism prevalence was highest among those classified as drug-dependent; these offenders also showed the highest offence frequency. An early onset was found to be associated with both a high offence frequency and a long criminal career. Recidivism and offence frequency across the entire career was highest among those sampled on a drug offence. Traffic offenders had the highest age of onset. This is due to the fact that traffic offenders are often older, one-time offenders.

The focus of criminal career research is primarily epidemiological and descriptive, disaggregating the criminal career into distinct and measurable components (Kyvsgaard, 2003). However, this does not imply that results from criminal career research are irrelevant for criminological theory. Besides providing basic information on criminal careers over the entire life span – information not previously available for the Dutch situation –, findings from this study offer a first step in determining what kind of theory is needed to explain development of criminal behavior from early adolescence to late adulthood.

Typological theories differentiate between adolescence-limited and life-course-persistent offenders; the latter showing a pattern of offending that is both frequent and lasting. While participation rates in crime drop with age, our results show a considerable number of individuals being criminally active during late adulthood. This is further illustrated by research showing that a lengthier follow-up period yields higher ages of termination. Both the skewness of the offence frequency distribution as well as the finding that criminal career duration is positively related to offence frequency, suggest there to be a small percentage of offenders that shows offending behavior that is both chronic and persistent. In addition, as predicted by typological theories offence frequency and criminal career duration were highest among those showing an early onset of offending behavior. To ascertain whether a small group of frequent and persistent offenders shows an offending pattern that truly is substantially and significantly different however, would require a study that incorporates estimates of all the criminal career dimensions into one analysis.

The recently developed group-based approach for modeling individual trajectories would provide such an analysis since it uses the individual offending behavior to identify clusters of trajectories in the population (Nagin, 2004; Nagin & Land, 1993).

Besides evidence for a small group of persistent offenders, we also find some individual characteristics that are associated with all career dimensions in the predicted direction (sex, early onset). However, other factors like alcohol and drug dependency seem to affect only specific career dimensions. Extrapolating conclusions of analyses of participation to the correlates of offending frequency and career duration would thus capture some important similarities, but would also mask some important differences (Smith, Visher, & Jarjoura, 1991). This finding is inconsistent with the mono-causal explanations offered by general theories. Typological theories, that do predict different causal factors to influence different career dimensions, are challenged to formulate specific causal arguments relating to each of the specific characteristics.

Information about long-term criminal careers extending into the adult years is not abundant internationally and virtually absent in the Netherlands. This study therefore focused on global patterns in criminal careers from early adolescence to late adulthood. Future research will focus more closely on the changes in individual offending that underlie these general trends. At the same time providing more elaborate tests of developmental criminological theories. Subsequent investigations will include the effects of age on crime and the effect of time varying life circumstances and prior offending on the development of criminal behavior.

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Appendix A Multivariate analyses

The effects of personal and criminal career characteristics on both the recidivism and termination prevalence were estimated using discrete event analysis. This technique allows for the incorporation of time-varying variables – here only age – and controls for right censoring – some individuals will not have recidivated or terminated their career within the observational period, but could do so in subsequent years. Within discrete event analysis a logistical regression is preformed on a person-year file, in which personal and career characteristics are entered as independent variables in every year. Two person-year files were constructed: one for analyzing the prevalence of recidivism – this file consisted of 52,403 years for 5,164 individuals – and on for analyzing the prevalence of career termination – consisting of 53,746 years for 3,380 individuals.

Tables 20 provides the numerical parameter estimates for the discrete event analysis for recidivism prevalence and termination prevalence respectively. Parameter estimates are given in log-odds-ratios and their exponents, or odds ratios. The odds ratios indicate the factor by which the prevalence changes as a result of personal or career characteristics. In Table 20 the coefficient for women in the recidivism analysis is -0.356 generating an estimate of a 70.0% reduction in recidivism prevalence compared to the men in the sample. In Table 20 an odds-ratio less than zero indicates that individuals with that particular characteristic terminate less than those without it.

Table 20 Parameter estimates for the discrete event analysis for recidivism and termination prevalence

	Recidivism				Termination			
	b		s.e.	exp (b)	b		s.e.	exp (b)
# years since 1977	-0.356	***	0.011	0.700	-0.280	***	0.012	0.756
(# years since 1977)²	0.009	***	0.001	1.009	0.006	***	0.001	1.006
Personal characteristics								
Sex	-0.970	***	0.078	0.379	-0.558	***	0.087	0.572
female								
Country of origin								
non-Dutch	0.053		0.057	1.054	0.312	***	0.068	1.366
Dependency indication								
alcohol	0.349	***	0.049	1.418	0.195	***	0.052	1.215
drugs	0.270	**	0.126	1.310	0.174		0.135	1.190
Offending characteristics								
Age of onset								
early onset (prior to age 16)	0.607	***	0.050					
Type of offence in 1977								
violent	-0.123	***	0.085	0.884	-0.143		0.093	0.867
property	0.125	***	0.070	1.133	0.116		0.076	1.123
damaging/public order	0.007	**	0.082	1.007	-0.009		0.088	0.991
drugs	0.405	***	0.140	1.499	0.429	***	0.159	1.536
other criminal law	-0.491	**	0.240	0.612	-0.563	**	0.255	0.569
traffic	-0.126	***	0.074	0.882	-0.143	*	0.080	0.867
other special laws	*(ref.)*		*(ref.)*		*(ref.)*		*(ref.)*	
Constant	-1.223	***	0.072	0.294	-1.722	***	0.094	0.179
N_{ind} (# individuals)	5,164				3,380			
N_{years} (# person-year combinations)	52,403				53,746			

*** = $p < 0.01$; ** = $p < 0.05$; * = $p < 0.1$

Chapter 3

Life span offending trajectories of a Dutch conviction cohort

An earlier version of this chapter was published in Dutch as: Blokland A., Nagin, D. & Nieuwbeerta, P. (2004). Criminaliteitspatronen over de levensloop; ontwikkelingen in het criminele gedrag van een cohort Nederlandse veroordeelden. *Tijdschrift voor Criminologie*, 46, 361-381.

Abstract

The aim of this paper is to describe the development of criminal behavior from early adolescence to late adulthood based on conviction data for a sample of Dutch offenders. Measured over an age span as long as ages 12 to 62, we ask: (1) whether there is evidence for criminal trajectories that are distinct in terms of time path, (2) whether there is evidence for a small group of persistent offenders, and (3) whether there is evidence for criminal trajectories that are distinct in the mix of crimes committed, or more specifically, is there evidence for persistent offenders disproportionately engaging in violent offences. The analysis is based on the conviction histories of the Dutch offenders in the Criminal Career and Life Course Study. Four trajectory groups were identified using a semi parametric, group-based model: sporadic offenders, low-level desisters, moderate-level desisters, and high-level persisters. Analyses show that high-level persisters engage in crime at a very substantial rate, even after age 50. Compared to other trajectory groups the high-level persistent trajectory group disproportionately engages in property crimes rather than violent crimes. Also, these distinct trajectories are found to be remarkably similar across age cohorts.

1 Introduction

More than three decades ago Wolfgang, Figlio, and Sellin (1972) reported that a small group of chronic offenders accounted for the majority of crimes. The impact of this seminal finding reverberates to this day. It triggered a vast criminological literature that has attempted to identify and characterize chronic offenders (e.g., Block & Werff, 1991; Blumstein, Cohen, Roth, & Visher, 1986; Blumstein, Farrington, & Moitra, 1985; Chaiken & Chaiken, 1984).

Accompanying this empirical effort, a line of taxonomic theorizing has emerged. In differing ways these theories postulate that the offender population is composed of subgroups that follow distinctive trajectories of offending which themselves may reflect different etiologies. Developmental taxonomies like those proposed by Moffitt (1993) and Patterson (Patterson & Yoerger, 1993) aided by newly developed analyzing techniques have spawned a new generation of empirical studies into the developmental course of criminal behavior. Like the theories they were designed to test, these studies have primarily focused on adolescents and young adults. The aim of this study is to contribute to the growing body of criminological research on the developmental course of crime and to expand its scope by presenting findings on offending trajectories that extend up to age 62.

The idea that criminals are neither all alike nor unique persons, but instead can be clustered into a number of distinct types or groups, that can be identified and studied, has had a long history in criminological thought (Gibbons, 1985). While many early classification schemes were sociologically based, focusing on adult behavioral roles, some also emphasized differences in intellectual or moral development before and during adolescence and its relation to later criminal behavior. Today, one of the leading typologies is put forth by Moffitt (1993, 1997). She argues that while many people engage in antisocial behavior at one point in their lives – most commonly during adolescence – this behavior is temporary and situational. In contrast, a small number of individuals show antisocial behavior that starts early in life and is stable and persistent from then on. While the main causes for the former to engage in crime are specific to the period of adolescent development, the criminal behavior of the latter is thought to be rooted in early childhood factors. Neurological difficulties combined with failing parent-child interactions set a small number of individuals of on a lifelong antisocial pathway. As these children continue to show behavioral problems in different settings, the burden of their troubled past is amplified because their history of problem behavior increasingly deprives them of conventional opportunities. Individuals following the adolescence-limited pathway, on the other hand, are not exposed to these childhood risk factors. Instead, it is argued that adolescence-limited offenders temporarily mimic the defiant behavior of the persistent offenders for the purpose of gaining independent status. Adolescence-limited offenders abandon these antisocial acts as soon as other means to establish themselves as autonomous adults come available and offer better prospects. Given that adolescent-limited offenders are motivated by their strive for independence, they are expected to engage primarily in crimes that symbolize adult privilege and autonomy, like vandalism, public order offences, substance abuse and theft (Moffitt, 1993: 694–95). Apart from the aforementioned crime types, the life-course-persistent group is more versatile and should engage more in victim-oriented offences, such as violence (p. 695).

Typological theories stand in sharp contrast to mono-causal theories (Sampson & Laub, 2003b). Such general theories argue that there is one common explanation for crime that applies to all members of the population. The exact nature of this cause can either be internal (e.g. self-control) or external (e.g., social control, differential association) but the key point is that it works similarly for all individuals (Paternoster, Dean, Piquero, Mazerolle, & Brame, 1997). As a result, general theories deny the existence of homogeneous clusters of offenders following different developmental pathways. If variation in the development of criminal behavior over the life span exists, this variation is quantitative only and not related to qualitative differences between offenders. Hirschi and Gottfredson (1983) even go as far as to argue that the age crime relationship is invariant and that crime declines similarly with age for all offenders.

Nagin and Land (1993) developed a semi parametric group-based modeling approach for analyzing longitudinal data that is particularly well suited for testing typological theories. The method assumes that the population is composed of a mixture of distinct groups defined by their developmental trajectories. The method enables researchers to test for the existence of the various trajectories underlying the developmental theory rather than a priori assuming them (Nagin, 1999; 2005).

Trajectory analysis of longitudinal data on criminal offending, most commonly measured by arrest, has revealed a number of distinct groups typically ranging from three to five depending on the sample. All of these studies have come up with a non-offender or sporadic offender group. Most studies also reveal one or more groups whose offending behavior resembles the proposed adolescent limited pathway, showing a rise in the early teens and a sharp decline during the early twenties. Many studies also identify a small fraction of the sample as highly active offenders. The trajectories of these high rate offenders differ in shape, some studies showing a decline between 20 and 30 (D'Unger, Land, McCall, & Nagin, 1998; Weisner & Capaldi, 2003), others reaching a plateau (Piquero, Brame, Mazerolle, & Haapanen, 2002). Some studies even find the high rate trajectory continues to rise (Chung, Hill, Hawkins, Gilchrist, & Nagin, 2002; D'Unger et al., 1998; Raskin White, Bates, & Buyske, 2001).

While these studies have progressed our understanding of variability in the development of offending over the life course, several limitations should be noted. First, the majority of longitudinal studies cover only a limited period of the entire life span. It thus remains unclear whether life-course persisters really exist as a distinct group, keep offending at a high rate as they age, and whether their criminal behavior is different from that of adolescent limited offenders. Second, few studies account for incarceration time. Piquero and colleagues (2001) show that not controlling for incarceration time can have serious consequences when estimating offending trajectories. Since frequent offenders are more likely to be incarcerated, not controlling for incarceration time results in underestimating their offending frequency, classifying them as less chronic, or even as desisting offenders. Finally, the problem of 'false desistance', individuals having no criminal records due to death, is largely overlooked (Eggleston, Laub, & Sampson, 2004; Piquero, Farrington, & Blumstein, 2003). False desistance particularly poses problems when mortality is not equally distributed among offender types.

In their landmark follow-up of the Glueck-men, Laub and Sampson (2003) make substantial headway in dealing with these problems. They reconstructed the criminal histories of the original delinquent boys from the Gluecks' *Unraveling Delinquency* (Glueck & Glueck,

1950) who were born between 1924 and 1932. This allowed Laub and Sampson to gather criminal records from age 7 to 70 which makes this study the longest longitudinal study in criminology to date. The number of days these men were incarcerated for ages 7 up to 32 was available from the criminal history data collected by the Gluecks' research team. Mortality data were obtained from both state and national death records, and integrated with the official criminal histories. Thus Laub and Sampson were able to control for the time the men were actually at risk of committing another offence. Using the group-based trajectory method, Laub and Sampson find that the age crime relationship is not invariant for all offenders – homogeneous groups of offenders exist that follow distinct trajectories. Or, put differently: the aggregate age-crime curve is not the same as individual trajectories. Six trajectory groups were identified in the Glueck data, revealing three desisting and three chronic trajectories. However, even for the small percentage of high rate chronics, offending declines with age. From this Laub and Sampson conclude that desistance from crime is the norm, that no group following a flat trajectory exists, and that evidence in support of life-course persistent offenders from prior studies was an artifact of the middle-adulthood censoring of observations (see also: Eggleston et al., 2004).

Although the Laub and Sampson study offers a unique opportunity to study the development of crime over the lifespan, like any study, it too has its weaknesses. First, Laub and Sampson were only able to control for incarceration time up to age 32. Given that prior criminal records play a major role in judicial decision-making (Clancy, Bartolomeo, Richardson, & Wellford, 1981), the average length of incarceration can be expected to be positively associated with age, especially for high frequency offenders.

Second, their study pertains to a sample of high-risk men, who cannot be expected to be representative of the entire offender population. This might compromise the external validity of their conclusions. Finally, while recognizing the immense effort of tracing the men and their criminal histories, the delinquent sample size is not that large (N=480). Since the high rate chronic group constitutes just a small fraction of the total sample, trajectory estimations for this group are based on as few as five individuals (Laub & Sampson, 2003: 105). In addition, as a result of mortality – 50% of the men have died by age 70 – trajectory estimations are based on ever-decreasing numbers of individuals; by age 70 a total of only 240 individuals remain to be divided over six trajectory groups.

The present study builds upon and expands insights gained from earlier studies into the development of offending behavior over the life-course, using criminal history data over a period of 50 years pertaining to a large sample of Dutch offenders. Based on the above-mentioned theoretical considerations and results from earlier work, we ask the following questions: (1) is there evidence for criminal trajectories that are distinct in terms of time path from early adolescence (age 12) to late adulthood (age 62), (2) is there evidence for a small group of persistent offenders, and (3) is there evidence for criminal trajectories being distinct in the mix of crimes committed, or more specifically, is there evidence for persistent offenders to be disproportionately engaged in violent offences.

2 Data and methods

2.1 Sample

The data set used in this study is compiled from the large-scale 'Criminal Career and Life-course Study (CCLS) that is being conducted at the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR).[1] With the exceptions noted below, the CCLS is a representative sample of 4% of all the cases of serious offences that were tried in the Netherlands in 1977.[2] Because the number of cases for drunk driving was very high, the sampling fraction for this type of offence was set to 2%. Conversely, a number of less common – mainly serious – offences (violent, sexual, and drug offences) were sampled at a higher rate to help ensure adequate representation in the final sample.[3] In the analyses that follow the cases were weighted to again represent the distribution of offense types tried in 1977. For further details see Nieuwbeerta & Blokland (2003). The total sample consists of 5,164 individuals. Because the aim of this study is to describe patterns of offending behavior over the entire life course, three important restrictions were placed on the sample used in the analysis.

First, because data was not available on the precise age at which foreign-born offenders came to reside in the Netherlands and no reliable criminal records of the countries of origin could be obtained, all individuals of foreign birth were excluded from the sample (N = 685).

Second, given the skewed age distribution of the sample (see below), few individuals have reached an age of 70 or more at the end of the observation period. Individuals older than 45 in 1977 (i.e., those born before 1932) were therefore also excluded (N = 443). The resulting sample used in this study thus consists of 4,036 individuals. To further avoid problems associated with having only a small number of individuals defining offending trajectories at the oldest ages we limited the offending trajectories to ages for which data was available on at least 600 individuals. This restriction has the effect of ending our observation of the offending trajectories at age 62. Table 1 shows the number of individuals observed at each three year period of the study.

1. The CCLS expands data on the sample first gathered byBlock & Van der Werff (1991; Van der Werff, 1986).
2. All cases ruled upon by a judge and all cases waivered by the public prosecutor for policy reasons or technical reasons – for example due to failing evidence.
3. (Attempted) Robbery, public violence, battery: 25%; (attempted) murder, offence against decency, rape, child molesting, other sexual assault: 100%; irrevocable community school sentences: 50%; drug offences: mean 17%.

Table 1 Number of individuals per year (entire sample)

age	# individuals
12-14	4,036
15-17	4,036
18-20	4,035
21-23	4,028
24-26	4,022
27-29	4,008
30-32	3,997
33-35	3,977
36-38	3,955
39-41	3,926
42-44	3,715
45-47	3,038
48-50	2,329
51-53	1,840
54-56	945
57-59	917
60-63	701

2.2 Measures

Extracts from the General Documentation Files (GDF) of the Criminal Record Office ('rap sheets') were used to construct the entire criminal careers of the sampled individuals. The GDF contain information on every criminal case that has been registered at the Public Prosecutor's Office. These extracts were supplemented with cases that normally would not be mentioned due to expiration periods. In this way, the entire criminal history before 1977 for every individual in the sample was reconstructed. Note that in The Netherlands a person is not given a 'blank sheet' upon becoming an adult and therefore the extracts contain both information on adult as well as on juvenile offences. Next, every new entry between 1977 and 2003 was recorded. While the GDF contain information on all offences that have lead to any type of judicial action, we choose to use only information on those offences that were actually followed by a conviction, thereby excluding cases that resulted in acquittal or prosecutorial disposition. Furthermore, in estimating trajectories we only used criminal law convictions, thereby excluding all special law convictions, including traffic convictions, which for the most part were convictions for drunk driving. Finally, the 1977 sampling offense was dropped from the data.

In addition to the GDF extracts, we used police records pertaining to the 1977 offence that led to inclusion in the study to gather information on personal characteristics of the sampled individuals. Nearly one tenth (9%) of the sample were female offenders. In 1977 the police classified 36% of the sampled offenders as alcohol dependent and 2% as drug dependent. Within the CCLS this information is supplemented by population registration data covering the entire follow-up period. This data provide information on marriage and fertility history.[4] Finally death records were searched to account for mortality in the

4. Based on the police file information from 1977 we were able to retrieve population registration data on marriage, children, and separation for 94.3% of the sample.

data during the follow-up period. In the 25 years following the sampling offence, 11% of the sampled offenders died.

2.3 Analytical strategy

The first step in the analysis involved construction of a person-period file of convictions. For each individual the record contained information on the number of convictions over three year time intervals starting at age 12. If applicable, the 1977-sampling offence was dropped from the data. If an individual died during the observational period, their record was censored for the years subsequent to death. Like Sampson and Laub (2003) and Piquero et al. (2002) convictions in periods subsequent to death were treated as missing data completely at random. The person-period file for the entire sample consists of 53,506 records relating to 4,036 individuals.

2.4 Statistical analysis

To identify types of criminal careers we use a latent class model especially developed to study group-based offending trajectories (Nagin & Land 1993; Nagin, 1999 & 2005). The model has two components. First, similar to most applications of hierarchical or latent growth curve modeling, a polynomial relationship is used to link offending and age. Here we use a cubic equation:

$$\log(\lambda_{it}^{k}) = \beta_0^k + \beta_1^k Age_{it} + \beta_2^k Age_{it}^2 + \beta_3^k Age_{it}^3$$

where the parameter λ_{it}^{k} is the predicted rate of conviction for individual i at age t given membership in group k. Age_{it} is the offender's age at time t, Age_{it}^2 is the square of offender's age at time t and Age_{it}^3 is the offender's cubed age at time t. The parameters β_0^k, β_1^k, β_2^k and β_3^k are estimated by the method of maximum likelihood under the assumption that within each trajectory group the number of convictions followed a Poisson process with rate parameter λ_{it}^{k}. The model was estimated using a SAS-based procedure described in Jones, Nagin, and Roeder (2001).[5]

Observe that coefficients defining the trajectory shape are all superscripted by k. This means that these parameters can vary freely across the k groups. As a consequence each trajectory group may have a different shape.

A key issue in the application of a group-based model is determining how many groups define the best fitting model. The Bayesian Information Criterion (BIC) provides

5. In estimating trajectories the time offenders were 'on the street' and at risk of committing an offence was taken in to account. This was accomplished using the "exposure time" adjustment that is available in the Poisson-based model described in Jones et al. (2001). The mean number of days offenders in our sample were incarcerated shows an age distribution similar to that of convictions, peaking at age 22 and gradually declining after that. Although we find an age pattern similar to that found by Laub and Sampson (2003), the magnitude of the phenomenon in our data is much smaller (peaking at an average of 4.6 days). This is both due to the composition of the sample and the more lenient penal culture in the Netherlands. However when we only consider those offenders actually incapacitated, we find that the average incarceration length per year increases with age. This once more underlines the importance of taking incarceration into account when estimating the development of offending over the life span, especially for the older ages.

a formal basis for selecting the optimal model. However, BIC does not provide the sole criterion, and more subjective criteria based on knowledge of the phenomenon and study objectives were taken into consideration (Nagin, 2005).

Beyond the trajectories themselves, another important product of the group-based trajectory model is each individual's probability of membership in the offender groups. This probability, which is called the posterior probability of group membership, is calculated by:

$$\hat{P}(k|Y_i) = \frac{\hat{P}(Y_i|k)\hat{\pi}_k}{\sum_k \hat{P}(Y_i|k)\hat{\pi}_k}$$

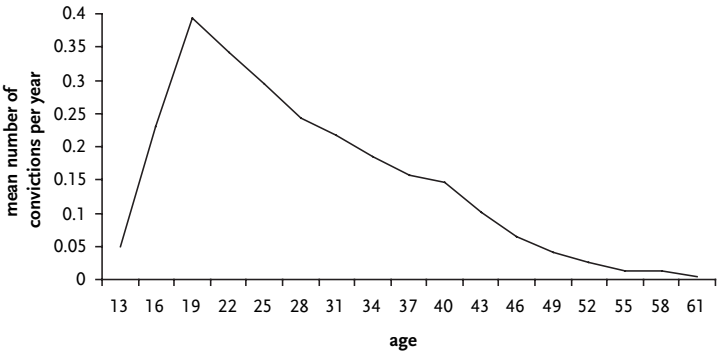
where $\hat{P}(Y_i|k)$ is the estimated probability of observing individual i's actual conviction history, Y_i, given membership in group k, and π_k is the estimated proportion of the population in group k. Based on these probabilities individuals are assigned to the developmental trajectory that best matches their conviction histories.

The *posterior probability* of group membership is distinct from the *probability* of group membership, k. The probability of group membership measures the proportion of the population that belongs to group k. This probability can also be thought of as the probability that a randomly chosen individual follows group k's trajectory. Its analytic purpose is to measure the size of each trajectory group. The *posterior* probability of group membership, by contrast, measures the probability that an *individual with a specific behavioral profile* belongs to a specific trajectory group k.

3 Results

The age-crime curve that results from averaging the conviction histories of all individuals is plotted in Figure 1. Like the curve based on cross sectional data, the age-crime relationship in our longitudinal data is unimodal and skewed, showing a steep rise during adolescence followed by a more gradual decline during adulthood. Below we address the question whether the shape of this aggregated age crime curve originates from stacking up individual trajectories of similar shape, or whether the aggregated curve obscures underlying diversity in developmental trajectories, thereby blurring the existence of groups of offenders following distinct developmental pathways.

Figure 1 Average age-crime curve for the entire sample based on individual careers (N = 4,036)



3.1 Distinct life span offending trajectories

Using the trajectory method we were able to assess whether different groups of offenders following distinct trajectories could be distinguished. The response variable in this analysis is a count, the number of convictions in every three-year period from ages 12 to 62. We tested one, two, three, four, five and six-group models of conviction trajectories. The four-group model proves to be most efficient when considering parsimony and comprehensibility. In most prior studies researchers have used the Bayesian Information Criterion (BIC) as one criterion of choosing the optimal number of groups. In some cases, however, the BIC score is not useful in identifying the preferred number of groups. In our data the BIC score continues to increase when more groups are added. The three-group model differentiates between those with zero or a negligible number of convictions and those repeatedly convicted during the observation period. The trajectories of the two repeatedly convicted groups mirror the classic 'hump'-shaped rise and fall of the aggregated age crime curve. The four-group model adds a group that shows a steep rise in the number of convictions in the late teens which remains high during the larger part of adulthood. This trajectory resembles the life course persistent pattern described by typological theories. Five and six group models reproduce similar trajectories but differentiate further between those showing hardly any convictions. Thus, adding groups beyond four does not reveal any important features of the data. Analyses reported below therefore are based on the four-group model.[6]

A numerical tabulation of the four trajectories are given in Table 2 and graphically presented in Figure 2. A group, which we called the 'Sporadic Offenders' (SO) is composed of individuals who show very few, if any, convictions besides their 1977-conviction. This group is estimated to make up 62.6% of the population. Two groups showed a rise and decline in the number of convictions during the observation period that resemble the familiar aggregated age-crime curve. We called the group with the lower peak the 'low level desisters' (LD) and the group with the higher peak 'moderate level desisters' (MD).

6. The number of convictions in each year is estimated as a cubic function of age for sporadic offender, low level and moderate level desisters. For high-level persisters a second order polynomial best fitted the observed values.

These two groups are, respectively, estimated to make up 26.4% and 9.5% of the population.[7,8] Finally Figure 2 shows a group with a consistently high number of convictions, especially during the adult years, compared to the other groups. This group was estimated to constitute 1.4% of the population and was labeled 'high level persisters' (HP). Eventually, even for this persistent group the number of convictions shows some decline.

We conducted a variety of Wald (χ^2 -based) tests to the test for equality of the linear, quadratic, and cubic term coefficient estimates across trajectory groups. These tests always rejected the hypothesis that the coefficients for the HP group were equal to those for the other three groups. Thus, as the visual comparison of the HP trajectory with the other trajectories suggests, the HP path is distinct, rather than parallel to the other trajectories.[9]

These results suggest that distinct trajectories can be empirically distinguished in the CCLS-data. Furthermore our results identify a small group of offenders that do not only offend at a high rate, but also continue to do so far in to adulthood – their trajectory showing significantly less decline than that of other types of offenders. Desistance therefore, does not, as Laub and Sampson (2003) claim, seem equally inevitable for all offenders.

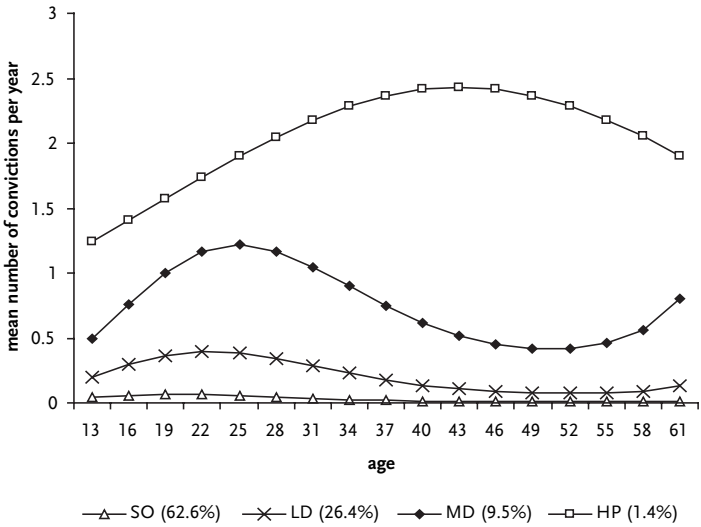
As previously indicated, the posterior probabilities of group membership provide the possibility to assign individuals to the group to which their posterior membership probability is largest. Table 3 reports the mean assignment probability for the entire sample. For example the mean HP-group posterior probability for the 60 individuals assigned to this group is very high, .94. Across the groups, the average posterior possibility ranges from .90 to .94. As discussed in Nagin (2005), this suggests that the four-groups are highly distinct. Assigning individuals to trajectory groups in this fashion also enables us to create profiles of the 'average' individual following the trajectory characterized by each group. Profiles of the crime mix and personal characteristics of trajectory group members are discussed below.

7. Given the age distribution of our sample the estimates for ages 12 to 14 are based on 4,036 individuals. Estimations for older ages are based on decreasing numbers of individuals, with a minimum of 701 at ages 60–62.
8. The slight up-tick in the estimated number of convictions for the moderate level desisters in the latest cohort does not represent a trend in the observed data, but is an artefact of the cubic model used.
9. One technical feature of our model complicated these tests. The HP trajectory shown in Figure 2 is actually a model with a quadratic trajectory. The linear and quadratic terms of this trajectory are indeed significantly different than their counterparts for the other trajectories. We also estimated a model in which the HP group followed a cubic trajectory. Here again the Wald tests rejected the null hypothesis of the equality of the linear, quadratic, and cubic terms of the HP trajectory with those of the other trajectory groups. Note that we use a quadratic trajectory to model the HP group because the cubic trajectory implies an upturn in offending in late middle age which does not conform with the trend in actual convictions for this group.

Table 2 Numerical values of the parameter estimates for the trajectory models

	Sporadic Offenders		**Low-level Desisters**		**Moderate-level Desisiters**		**High-level Persisters**	
	estimate	s.e.	estimate	s.e.	estimate	s.e.	estimate	s.e.
Intercept	-4.754	0.521	-3.862	0.473	-3.496	0.727	0.846	0.559
Age	4.862	0.552	4.786	0.463	4.906	0.640	0.595	0.353
Age²	-1.656	0.185	-1.508	0.149	-1.469	0.179	-0.066	0.053
Age³	0.152	0.018	0.134	0.015	0.130	0.016		

Figure 2 Estimated trajectories for the four group model



3.2 Crime mix

Next we address the question whether trajectories are distinct in crime mix; that is, do offenders following different trajectories, on average, engage in different types of crime. Based on current typological theories we expect persistent offenders, compared to non-persistent offenders, to disproportionately engage in violent crime. Posterior probability-based classifications were used to create profiles of the crime mix of each trajectory and are reported in Table 3.

Table 3 Mean assignment probability for the four group model based on the entire sample

	Group			
Assigned group	SO	LD	MD	HP
Sporadic Offenders (SO)	0.94	0.06	0.00	0.00
Low-level Desisters (LD)	0.08	0.90	0.03	0.00
Moderate-level Desisters (MD)	0.00	0.06	0.92	0.02
High-level Persisters (HP)	0.00	0.00	0.06	0.94

On average, individuals following the SO-trajectory were convicted for a criminal law violation once or twice between age 12 and age 62. Over half of criminal law convictions (53%) are for property offences. The remaining 47% of convictions were mostly for violent crimes (17%) and damaging goods (21%). While not used to estimate trajectory groups, we can also include convictions for traffic offenses and other non-criminal law offenses in these calculations. The lower part of Table 4 shows that criminal law convictions constituted only 45% of the total number of convictions for criminal law and special offenses for the average SO. Thus, if non-criminal offenses are included in the conviction counts, the average number of convictions for SO over the 50 years of the study more than doubles.

For individuals on the LD-trajectory the average conviction rate was almost once every four years. While their conviction rate was much higher than the SO group, the crime mix for criminal offenses of the LD trajectory was nearly identical to that for the SO trajectory. Like the SO group, the LD group were largely convicted for property offences (56%). Convictions for violent crimes and damaging property both made up 18% of the total number of convictions. However, criminal law convictions made up 72% of all convictions of individuals following the LD trajectories which is much larger the for the SO group.

Table 4 Trajectory characteristics and crime mix per trajectory group for the entire sample

	SO	LD	MD	HP
% of sample	62.6	26.4	9.5	1.4
Esitimated trajectory characterisitcs[1]				
peak age	19	22	25	43
# of crimes (criminal law)	1.5	10.4	38.4	104.7
Crime mix (criminal law)[2]				
% violent	17.3	18.2	13.2	9.6
% property	53.4	55.5	66.1	71.9
% damaging	21.0	18.0	11.6	10.4
% drugs	1.9	3.1	4.3	3.7
% guns	4.3	4.2	3.9	3.8
% other criminal law	2.0	1.0	0.9	0.6
% total criminal law	100.0	100.0	100.0	100.0
Crime mix (total)				
% criminal law	44.7	71.5	79.0	89.8
% traffic	39.5	18.5	11.6	4.4
% other	15.9	10.0	9.4	5.7
% total	100.0	100.0	100.0	100.0

1 Predictions based on the four group model

2 Percentages based on observed distributions – persons classified in groups based on posterior probability of group membership

The average individual on the MD-trajectory was convicted 38 times between ages 12 and 62. Almost two-thirds of the total number of criminal law violations of the MD group was for property offences. The rise in the proportion of property offenses compared to SO and LD was at the expense of the proportion of convictions for violent offenses and damaging goods. Eight out of ten convictions for MD were convictions for criminal law violations.

Finally, the summary statistics in Table 4 show that the average HP was convicted at an extraordinarily high rate – once every six months during the 50 years between age 12 and 62. Thus, by age 62 the average HP had been convicted over a hundred times. Continuing the trend of an increasing proportion of property offences with the rise of the average number of offenses, HP were convicted for property offenses seven out of ten times they were convicted. The proportion of convictions for violent crimes and damaging goods dropped further to 10% each. Convictions for criminal law violations constituted 90% of total HP convictions. In sum, these results suggest that trajectories not only differ in time path, but also in crime mix.

3.3 Persistent offenders

While property crimes constituted the largest component of every trajectory, the results show that the proportion of property crimes increased as the average number of convictions increased. Thus, while High-level Persistent offenders committed more violent crimes in absolute terms than the other groups, if measured on a proportional basis they were not more violence prone. Instead, HP showed an increasing proportion of property crime compared to less active, desisting offenders. Stated differently the HP group seemed to specialize more in property offences than did desisting offenders.

Additional insights into the career of the average persistent offender can be gained by further disaggregating the offense categories for the property and violent crimes. Table 5 reports the distribution of the total number of criminal convictions for persistent offenders for more specific types of property and violent crimes across four age-periods.

Table 5 Crime mix across 10 year age periods for High-level Persistent offenders (in percentages)

	age			
	12-23	24-35	36-47	48-62
Crime mix (criminal law)				
% theft	19.5	28.4	43.9	62.7
% group theft	34.0	4.5	1.0	1.0
% burglary	11.2	14.6	11.6	2.8
% other property	6.9	6.3	5.4	5.4
% violent theft	1.8	1.9	0.6	0.1
% other violent	6.4	6.0	10.8	3.6
% drugs	3.0	4.5	2.9	1.4
% other criminal law (including damaging and guns)	17.4	19.6	19.3	23.1
% total	100.0	100.0	100.0	100.0

Between ages 12 and 23 group-theft constituted 34% of the total number of criminal convictions. In general group-offending has been shown to decline as offenders reach adulthood (Reiss & Farrington, 1991). Consistent with prior research, the proportion of group-theft in the total number of convictions of persistent offenders steeply declined as they age. Burglary on the other hand peaked between ages 24 and 35 and then declines. While

the percentages of all other offense types either remained fairly constant or showed moderate declines as persistent offenders aged, only (non-group) 'theft' (e.g., pick pocketing, shoplifting, vehicle theft) showed a steep increase – the percentage of simple thefts more than tripling across age periods. In this regard, High-level Persistent offenders differ from other types of offenders for whom the percentage of thefts remained fairly stable as they age (percentages not shown).

3.4 Personal characteristics

Finally, the personal characteristics of the trajectory groups as taken from police files and population registration information are reported in Table 6. Compared to other types of offenders the average High-level Persistent offender was least likely to be female. While there were no marked differences in occupational status, HP were more likely to have been unemployed in 1977. Regarding alcohol and drug use, we found that the HP individuals were least likely to be registered as alcohol dependent but most likely to be registered as drug dependent (1977 police data). Population registration data covering ages 12 to 46 showed that compared to other types of offenders the average HP is least likely to have been married and least likely to have had children during that period. Finally, death records showed that persistent offenders had the highest chance of dying before the end of the observation period (20%). The higher mortality rates of the HPs is not a reflection of their being older, on average, than the other groups. In fact at the time of their conviction in 1977 they were on average the youngest group – the average age in 1977 ranges from 21.4 for the HP's to 26.6 for the SO's. In sum, these statistics suggest that persistent offenders not only showed frequent and chronic criminal behavior, they also tended to perform poorly in both professional and personal life course domains.

Table 6 Offender profiles based on the four group model for the entire sample (in percerntages)

	%			
	SO	LD	MD	HP
female	11.1	4.8	2.5	2.0
Charcterisitcs in 1977				
occupational status:high	30.6	22.0	21.5	18.3
occupational status:low	29.5	38.1	33.4	29.6
unemployed	39.9	39.9	45.1	52.1
alcohol-dependent	40.4	31.8	23.4	23.1
drug-dependent	1.7	2.1	5.2	3.2
Life events before age 46				
married	82.0	71.3	57.1	50.8
children	76.0	73.1	56.3	45.1
seperated	28.9	45.2	44.5	42.3
dead before 2002	9.7	11.7	19.2	19.6

3.5 Variation across cohorts

The sample used in the CCLS-study consists of persons who were tried in 1977. Therefore, unlike in birth-cohort studies, the age range in the sample is broad and skewed, ranging from 12 to 45 with a peak at age 19. Two implications of this age diversity deserve

comment and attention. First, given the age range in 1977, the convictions recorded for the sample cover a long period – from 1944 (the year when the 45 year old were 12 years of age) to 2002. National levels in registered crime in the Netherlands increased ten-folded over this period (Heide & Eggen, 2003). This increase probably reflects both increased participation in crime (i.e., more people committing crimes) and increased frequency of offending by those involved in crime.[10] These historical changes could have influenced the analysis, either by affecting the distribution of offenders across trajectory-groups or by affecting the officially recorded offense frequencies of the individuals within the trajectories, or both.

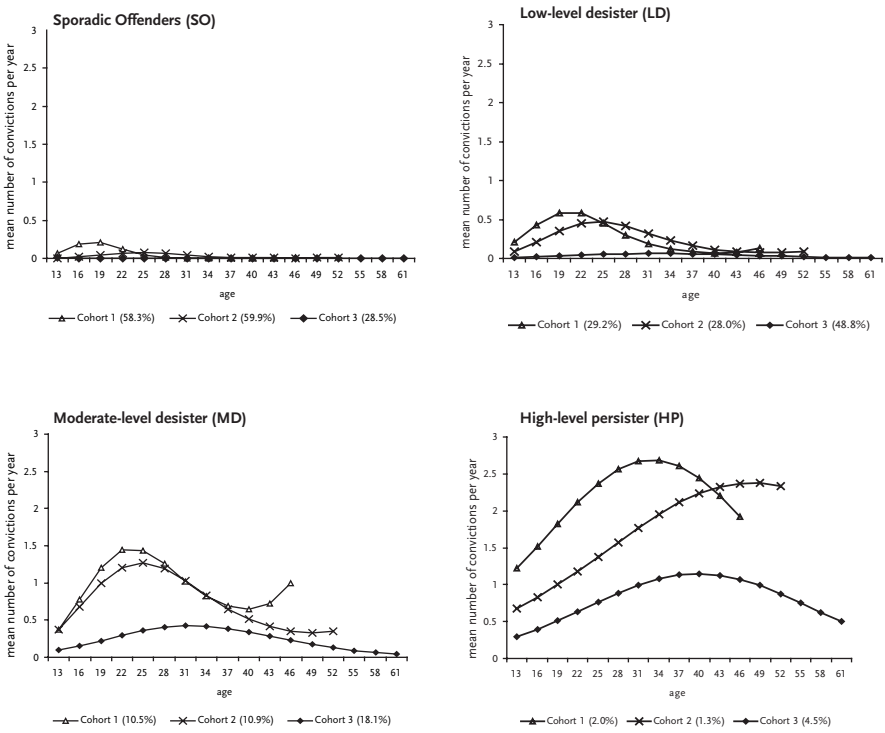
Second, individuals were not randomly sampled from the entire population. Instead they were all – by definition – criminally active in 1977. If the assumed distinction between adolescent limited and life course persistent offenders holds, persistent offenders will be overrepresented among those in the right tail of the age-in-1977-distribution. This will be the case since for most individuals the individual age-/crime relationship shows a sharp decline with age. Those still active during late adulthood are thus more likely to belong to the minority of persistent offenders.

In order to examine the extent to which the abovementioned historical changes and sampling properties affect our results, we analyzed whether trajectories differ in distribution, shape or crime mix across age-groups in the sample. For these analyses the sample was divided into three cohorts based on the individual's age in 1977. The first cohort was comprised of those offenders aged between 12 and 21 in 1977. The second cohort consisted of individuals aged 22 thru 31 in 1977. The final cohort consisted of individuals aged 32 and up, with a maximum of 45 in 1977. The resulting person-period file for the first cohort (12–21) contained information on 17,480 years relating to 1,570 individuals that covered the period from ages 12 to 47. The person-period file for the second cohort (22–31) contained information on 19,316 years relating to 1,451 individuals and covered the period from ages 12 to 53. The person-period file for third and oldest cohort (32–45) contained information on 16,665 years relating to 1,015 individuals and covered the period from ages 12 to 62.[11]

A four-group model was estimated for each of the three cohorts. The age trajectories for the expected conviction rates in the three cohorts are plotted in Figure 3. For ease of comparison each graph in Figure 3 presents the trajectories of each offender type across cohorts. Table 7 compares the size of the group, the peak age of offending, the total number of offenses, and the crime mix by trajectory group across cohorts. Figure 3 and Table 7 reveal a number of similarities as well as some marked differences between cohorts.

10. Part of this increase may also result from a registration effect due to computers becoming widespread.
11. To increase the stability of our estimations we decided to exclude all thee-year age periods for which information was available for less then 600 individuals. This was only the case in the earliest cohort.

Figure 3 Estimated trajectory per trajectory group across cohorts



In all three cohorts the four distinguished trajectory groups show essentially similar time paths (see Figure 3). A relative large group of 'sporadic offenders' (SO) can be distinguished in all cohorts. In addition, across all three cohorts we found two groups, the 'low-level' and 'moderate-level desisters', that show the characteristic rise and decline with a peak in the mid-twenties that differs only in the top-level frequency of offending. Finally, all three cohorts reveal a small group of offenders who continue to be convicted at a non-trivial rate far into adulthood. The time paths of the trajectories found in the analyses of the separate cohorts are essentially similar as the ones found in our previous analysis on the CCLS-sample as a whole (see Figure 2).

Cross-tabulating the actual number of people assigned to each trajectory group in each of the cohorts by those assigned to each group in the entire sample (percentages not given), revealed that in most cases individuals assigned to a given group in each of the separate cohorts, were assigned to the same group when the analysis pertain to the entire sample. When this was not the case, individuals were most likely to be assigned to the next active group. The distributions of crime types across cohorts (within distinguished trajectory groups) were highly similar as well, with the fraction of criminal law convictions increasing as the total number of convictions increased. As in the analysis on the entire sample, across cohorts, the high-level persistent group was the least violent group in terms of percentage of total convictions and most specialized in property crimes (see Table 7).

Table 7 Trajectory characteristics and crime mix per trajectory group across cohorts

	Cohort 1	Cohort 2	Cohort 3	Cohort 1	Cohort 2	Cohort 3	Cohort 1	Cohort 2	Cohort 3	Cohort 1	Cohort 2	Cohort 3
		SO			LD			MD			HP	
% of sample	**58.3**	**59.9**	**28.5**	**29.2**	**28.0**	**48.8**	**10.5**	**10.9**	**18.1**	**2.0**	**1.3**	**4.5**
Esitimated trajectory characterisitcs[1]												
peak age	19	25	13	19	25	31	22	25	31	34	49	40
# of crimes (criminal law) up to age 47	1.8	1.1	0.0	9.5	9.1	1.6	36.4	28.6	10.4	81.7	56.4	29.9
Crime mix (criminal law)[2]												
% violent	13.4	17.7	0.0	15.1	19.3	22.3	13.3	14.5	20.1	8.8	12.0	10.1
% property	60.7	46.1	0.0	58.8	54.4	48.4	65.8	63.5	56.9	80.9	64.6	69.7
% damaging	21.0	25.1	0.0	18.4	17.6	17.8	12.0	11.9	15.7	6.4	14.7	11.8
% drugs	1.4	2.3	0.0	3.6	3.5	1.5	4.4	4.6	1.6	2.5	4.9	4.4
% guns	2.1	6.8	0.0	3.2	4.1	7.1	3.7	4.5	4.8	1.0	2.7	3.0
% other criminal law	1.4	2.1	0.0	0.9	1.0	2.9	0.8	0.9	1.0	0.4	1.0	1.0
% total criminal law	100.0	100.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Crime mix (total)												
% criminal law	61.0	37.0	0.0	75.2	71.0	52.8	78.6	77.5	68.3	92.4	88.0	82.9
% traffic	26.7	44.0	78.0	14.9	19.1	34.1	12.2	12.8	21.2	3.7	4.6	8.0
% other	12.3	19.1	22.0	9.9	9.9	13.1	9.2	9.7	10.5	3.8	7.3	9.1
% total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1 Predictions based on the four group model
2 Percentages based on observed distributions – persons classified in groups based on assignment probability

However, there were differences among the three cohorts that are noteworthy. One is the increase in the estimated average number of offenses within each trajectory group across cohorts. Typically in all graphs the more recent cohorts showed higher rates of offending than the older cohorts. This is likely a reflection of the earlier mentioned rise in registered crime in the Netherlands during the past decades.

Another notable difference is the fraction of Sporadic Offenders. The SO's composed only 29% for the oldest cohort compared to 58 and 60% for the youngest and middle cohort, respectively. The Low-level Desister group on the other hand were largest in the oldest cohort compared to younger cohort. Furthermore, Low-level Desisters in the oldest cohorts were convicted solely for traffic or other non-criminal offenses (see Table 7). These different findings for the oldest cohort are explained by the fact that offenders in the older cohort were disproportionably traffic offenders in 1977[12] and traffic offenders are most likely to be Sporadic Offenders. Consequentially, in the oldest cohort statistical modeling differentiated between those who have no convictions besides their 1977 conviction (classified as Sporadic Offenders in the third cohort), and those who have one or two convictions (classified as Low-level Desisters in the third cohort). The Sporadic Offender and Low-level Desister trajectory in the oldest cohort are thus best regarded as a single group.[13]

In sum, the analysis of the separate cohorts leads to similar conclusions than those based on the entire sample.

4 Conclusion

Our results show that the offender population is not homogeneous. Offender groups following different developmental trajectories can be distinguished in our data. The largest group, which we call Sporadic Offenders, had a very low conviction rate. Indeed for many their 1977 conviction was their only conviction. The age-conviction relationship of Low-Level Desisters and Moderate-Level Desisters showed the familiar inverse u-shaped curve with a peak during early adulthood. These two trajectories differ principally in the average number of convictions. Finally, High-level Persisters showed a trajectory that is less curved. After a steep rise in early adolescence the conviction rate of these offenders stayed high for the larger part of their adult life period. On average, high-level persistent offenders were convicted two times per year, between ages 12 and 62. Contrary to what was predicted by typological theories, persistent offenders did not disproportionately engage in violent crime, instead their average career typically consisted disproportionately of property crimes of increasing simplicity. Persistent offenders were also shown to perform poorly across different life course domains.

12. The fraction of individuals sampled on a traffic offence increases from 13.1% in the latest cohort, to 33.9% and the middle cohort, to 40.7% in the earliest cohort.
13. An inspection of mean assignment probabilities also shows that the distinction between the SO and the LD in the third cohort is fuzzy: the average group membership probabilities for LD to be assigned to the SO-group is rather high, i.e. 0.42. N.B. In comparison: all other 'off-diagonal' probabilities in these tables are lower than 0.06.

Interpreting these results, three salient questions need further answering: who are these High-level Persisters, what kinds of crimes do they commit, and why weren't they incarcerated? We will deal with these questions in reverse order.

Most longitudinal studies that account for incarceration time have been on Anglo-American data (e.g., Piquero et al., 2001, Sampson & Laub, 2003); a society that differs from the Netherlands both in terms of levels of violent crime and in penal culture. The overall level of violent crime in the Netherlands has been – and still is – relatively low compared to that in the United States. The violent crime rate – the number of registered violent crimes per 100,000 inhabitants – in the United States between 1980 and 1998 fluctuated between 538 and 773. During that same period the violent crime rate in the Netherlands rose from 145 and 368 (Smit, 2001). Since prison sentences for violent crimes tend to be longer, lower levels of violent crime – relative to other types of crime – render shorter average sentence lengths. Above that, at least until 1990 the Netherlands was characterized by a lenient penal climate compared to the United States and most other European countries. The detention rate – the number of prisoners per 100000 inhabitants – being low, relatively few convicted offenders sentenced to prison, and judges imposing relatively short prison sentences (Kommer, 1994). In the CCLS the average number of days incarcerated per year tops at little over 3 days between ages 21 and 23. If only those offenders that were actually sentenced to prison are taken in to account the average number of days incarcerated does not rise above 63 days a year until age 41.[14] Both the low overall levels of violent crime and the lenient Dutch penal culture during the period under study may have contributed to the fact that HP-offenders were not incarcerated at higher rates or for longer periods as could be expected based on prior American studies.

Contrary to predictions based on Moffitts' typological account (Moffitt, 1993), persistent offenders in our sample were mainly property offenders. The criminal histories of persistent offenders were filled with minor property offences like shoplifting and petty theft, more so than those of other trajectory groups and this became even more marked as persistent offenders aged. The high percentage of less serious property crimes may have contributed to why these offenders weren't incarcerated for longer periods. While overall levels of violent crime are lower in the Netherlands, this does not readily explain why when compared to other offender groups in the CCLS-data, the HP-offender group did not show a disproportionate level of violent crime.

Based on the content of their criminal career and the fact that police information showed persistent offenders to be overrepresented among those recorded as drug dependent in 1977, we feel confident to conclude that the average persistent offender was an addict committing crimes to provide for his drug-habit. Unlike in the United States, the prosecutorial attention on drugs in the Netherlands was and remains primarily focused on large scale dealing and trafficking, not on individual drug use. This explains why the criminal career profile of persistent offenders did not show a disproportionate percentage of drug offences (Table 4), and also why that percentage did not rise dramatically as

14. After that the average number of days incarcerated per incarcerated offender rises steeply: the few offenders incarcerated at that age serving long prison sentences. For comparison: Laub & Sampson report the average number of days incarcerated per year to top at 150 days at age 16 for the boys in the Glueck-sample.

persistent offenders aged (Table 5). While drug dependency may have acted as a catalyst for criminal behavior, the time pressure generated by the increasing need for drugs eventually may preclude more complex criminal behavior (Goldman, 1981). This may explain the rising proportion of simple thefts in the crime mix of HP's as they aged. Furthermore, drug dependency may explain persistent offenders' troublesome employment and marriage patterns and also may have contributed to their untimely deaths.[15]

Finally, our results question the idea of desistance by default. Our data – contrary to that of Sampson and Laub (2003: 104) – show High-level Persistent offenders to be convicted at a non-trivial rate even at ages over 50. The idea of desistance by default is strongly linked to the idea that desistance is triggered by changes in situational and structural life circumstances like a good marriage and a stable job (Laub & Sampson, 2003; Sampson & Laub, 2003a).[16] Changes in life circumstances are said to especially important in what Arnett (2000) called the period of emerging adulthood (18–25); a period of exploration unconstrained by enduring responsibilities that are normative in adulthood (Piquero et al., 2002). What makes the high-level persistent group distinctive is that while other trajectory groups show a pronounced decline in their conviction rates after this period of emerging adulthood, the high-level trajectory group did not.

Conviction rates eventually did decline, even for persistent offenders. Given the difference in timing however, we think this eventual decline was most likely due to other factors than investment in conventional institutions. If the majority of HP-offenders are indeed addicts, this may have contributed to their persistence as well as their eventual desistance. Drug and alcohol use negatively affect health and appear to do so at a higher rate as individuals age (e.g., Benshoff, 2003). Prolonged substance abuse worsens or may even cause chronic illnesses or symptoms such as collapsed veins, chronic body pain, hepatitis C, hypertension and related cardiovascular issues, depression and sleeplessness (Anderson & Levy, 2003). The narrative accounts of the lives of the Glueck-boys also testify to the deleterious health-effects of long-term substance abuse (Laub & Sampson, 2003). By the time High-level Persisters reach age 50 their life style is likely to have resulted in increasingly serious health problems. In turn, these health problems may compromise their mobility to such an extent that the commission of crimes is no longer physically possible.

To get a clearer picture of the mechanisms that generate persistence and desistance, especially the interactions among drugs, offending, and the offender's social environment, in-depth, qualitative analysis of the criminal careers and life courses of these persistent offenders would be a worthwhile enterprise.

15. The alternative explanation that crime and drug-use are both originate in a shared underlying propensity seems to be contradicted by our finding that not only the average number of offenses, but also the time path of the persistent offender group differs from that of the other groups.
16. While the age graded theory of social control is said to incorporate the effects of life circumstances as well as age, the influential balance is weight heavily towards life circumstances.

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Chapter 4

Age, crime, and the life circumstances: a multi-level growth curve analysis

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Abstract

This study focuses on the development of criminal behavior over the lifespan at the individual level. First, it examines the impact of life circumstances, like work and marriage have on offending. Next, it tests whether group differences in criminal behavior are stable over the life course. Finally, it examines the extent to which the age-crime relationship can be explained by age-graded differences in life circumstances. The present paper is based on individual criminal careers over a period of 60 years. Official data were retrieved for a 4% (N=4.684) sample of all individuals whose criminal case was tried in the Netherlands in 1977. Self-report data were derived from a nationally representative survey administered in the Netherlands in 1996 to 2.244 individuals aged 15 years or older. Multi-level Negative Binomial Models (MNBM) are used in the analysis of the data. Within these models the age-crime relationship at the individual level is estimated using a piece-wise linear function. Results show that life circumstances substantially influence the chances of criminal behavior, and that the effects of age and life circumstances on criminal offending differ between early and late onsetters.

1 Introduction

The age distribution of crime is one of the most replicated facts of criminology. Many studies show that offending peaks during adolescence and gradually declines during adulthood (Farrington, 1986; Gottfredson & Hirschi, 1990; Wilson & Herrnstein, 1985). However, while there is relative consensus about the general shape of the age crime distribution, the processes generating this distribution are still a matter of debate. Several hypotheses have been offered. *Static* theories like that offered by Gottfredson and Hirschi (1990) argue that the age distribution of crime is invariant (Hirschi & Gottfredson, 1983, 1995). While some people are more crime prone than others, those that are, remain so even when absolute levels of crime decline in adulthood. *Dynamic* theories like the one formulated by Sampson and Laub (Laub & Sampson, 2003; Sampson & Laub, 1993) on the other hand state that changes in life circumstances directly influence criminal behavior (Sampson & Laub, 1995). The bulk of the decline in crime during adulthood is thought to result from the increasing number of individuals who experience crime-inhibiting changes in life circumstances as they age (Kanazawa & Still, 2000; Laub & Sampson, 2003: 278). Finally, *typological* theories, like the one offered by Moffitt (1993), claim that the aggregate age crime distribution is actually a combination of several distinct groups of offenders each following different developmental trajectories. A small group of individuals that engage in antisocial behavior at every stage of life is thought to make up the tails of the age-crime curve, while a larger group is thought to fill out the adolescent peak with criminal careers of much shorter duration (Moffitt, 1994).

In the present chapter, we test hypotheses regarding the age-crime relationship derived from these three theoretical perspectives. We therefore examine the extent to which life circumstances affect crime after enduring individual differences are taken in consideration, the extent to which the age-crime relationship varies between types of offenders, and the extent to which effects of life circumstances vary between offenders. Finally, we examine the extent to which variation in crime by age at the aggregate level is due to age-graded differences in life circumstances and the distribution of offender types in the population. These questions are examined using two datasets, one containing official and one containing self-report individual level data covering the period from age 10 to age 70.

2 Theories of crime over the life course

Theories offering explanations for the development of crime over the life course can be expediently grouped into static, dynamic and typological theories (Paternoster, Dean, Piquero, Mazerolle, & Brame, 1997). First, static theories ascribe criminal behavior to some latent characteristic – an individual's criminal propensity –, which develops before or during early childhood (Gottfredson & Hirschi, 1990; Rowe, 1996; Wilson & Herrnstein, 1985). Once formed, this propensity not only influences criminal behavior but also the individual's development in other life domains (e.g., work, marriage), without itself in turn being influenced by important changes in life circumstances. A prominent example of a static theory is Gottfredson & Hirschi's General Theory of Crime (Gottfredson & Hirschi, 1990). This theory states that inadequate socialization within the family leads to low

levels of self-control. Low self-control in turn leads to elevated levels of selfish, impulsive and risky behavior, including crime. From a static perspective important changes in life circumstances like becoming unemployed or the failure of a marriage are within the realm of deviance and are seen merely as illustrations of the versatility of offenders and thus predictable from the individual's criminal propensity (Hirschi & Gottfredson, 1995: 134). Any correlations between life circumstances and crime therefore are spurious in as far as they are both caused by the same underlying trait.

Static theories do not explain the age-crime relationship at either the aggregate or the individual level. They just state that age has a direct effect on crime, and that this effect is best seen as resulting from an, up till now unspecified, unitary aging process (Hirschi & Gottfredson, 1995: 135). Both cross-sectional and longitudinal based aggregated age-crime curves simply reflect this maturation process at the individual level. Static theories thus predict that between-individual differences in crime are time-invariant. Those high in criminal propensity continuously exhibit more criminal behavior than those low in criminal propensity, even though the frequency of crime declines with age for both groups (Hirschi & Gottfredson, 1995).[1] Gottfredson and Hirschi's General Theory is said to be compatible with absolute, but not relative changes in the likelihood of offending (i.e., changes within the relative standing within the population) (Hirschi & Gottfredson, 1995). While they render movement from high self-control to low self-control highly unlikely, those low in self-control may show some upturn as a result of ongoing socialization throughout life (Gottfredson & Hirschi, 1990: 107–108). This implies that the little (if any) individual variation in the development of crime over the life span, is most likely to be caused by individuals initially more prone to crime showing a steeper decline in their criminal behavior over time than those already well socialized during childhood and therefore less crime prone.

The second group of developmental criminological theories is formed by dynamic theories. Dynamic theories differ from static theories in the length of the period within which they render a direct causal influence on crime possible and allow changes in life circumstances during and after adolescence to be of influence on the development of criminal behavior within that period (Laub & Sampson, 2003). Sampson and Laub (1993) for example propose a dynamic theory of informal social control, in which crime is inhibited when persons are bonded to conventional institutions. Specific sources of informal control can differ by age (e.g., school, work, marriage) and the chances of committing an offence in a given period of time are the product of the level of informal social control experienced during that period. Above that, while static theories attribute changes in life circumstances to a selection process triggered by criminal propensity, dynamic theorists

1. Gottfredson and Hirschi's General Theory is said to be compatible with absolute, but not relative changes in the likelihood of offending (i.e. changes within the relative standing within the population) (Hirschi & Gottfredson, 1995). While they render movement from high self-control to low self-control highly unlikely, those low in self-control may show some upturn as a result of ongoing socialization throughout life (Gottfredson & Hirschi, 1990: 107–108). To reconcile this with Gottfredson and Hirschi's static perspective it must be assumed that socialization proceeds with approximately the same rate for all individuals. The notion of ongoing socialization implies thatthe little (if any) individual variation in the development of crime over the life span, ismost likely to be caused by individuals initially more prone to crime showing a steeper decline in theircriminal behavior over time than those already well socialized during childhood and therefore less crime prone.

view changes in life circumstances as, at least in part, depending on chance (Laub, Nagin, & Sampson, 1998; Laub & Sampson, 2003: 34; Sampson & Laub, 2003a: 306).[2] This makes that individuals, regardless of their criminal propensity, can differ in the development of crime over their life course, depending on the number and timing of changes in life circumstances they have gone through (Nagin & Paternoster, 1994).

While recognizing individual differences in criminal propensity, dynamic theories argue that the effects of age on crime are to a large extent a function of the life circumstances people find themselves in at different stages of the life course (Kanazawa & Still, 2000; Laub & Sampson, 2001: 44). As a result individuals vary in the way their criminal behavior develops during the course of their lives. The decline in the aggregate age-crime curve is thought primarily to result from the growing number of people undergoing crime-inhibiting changes in their life circumstances as they commence to adulthood. As Laub and Sampson (2003: 278) state: "Although age is clearly important in understanding desistance ... most offenders desist in response to structural turning points".

Typological theories complete the theoretical triptych. Adherents of typological theories assume that the causes for criminal behavior differ between different kinds of offenders (Loeber & Stouthamer-Loeber, 1998; Moffitt, 1993; Patterson & Yoerger, 1993). The dual taxonomy of offenders offered by Moffitt for example, distinguishes life-course-persistent from adolescence-limited offenders (Moffitt, 1993). Moffitt claims that, while the persistent criminal behavior of the former is the outcome of the interaction between neurological deficits and defective upbringing, the more limited criminal careers of the latter result from them temporary mimicking their anti-social peers because of the their apparent adult status. Unlike static theories, typological theories expect variance in the development of crime over the life course to be systematically related to enduring individual characteristics (with those high in criminal propensity showing an early onset of delinquency and less desistance). In her dual taxonomy (Moffitt, 1993, 1994), Moffitt further argues that due to their early onset of problematic behavior, life-course-persistent offenders have missed out on opportunities to acquire and practice prosocial behavior during early childhood. As a result, the inhibiting effects of later changes in life circumstances for this group are expected to be limited. Adolescence-limited offenders do have the capacity to respond to shifting reinforcements contingencies as they gradually reach adult status via conventional pathways (e.g., school, work, marriage) (Moffitt, 1997).[3] Typological theories thus expect the effects of life circumstances on crime to be different for different types of offenders (Moffitt, 1994).

Typological theories assume that the aggregated age-crime curve can be disaggregated into a limited number of groups following different offending trajectories. A small segment of persistent offenders causes the tails of the distribution to flare, while a much larger segment of limited offenders are responsible for the peak in the distribution dur-

2. In their recent work Laub and Sampson also stress the importance of agentic action (Laub & Sampson, 2001, 2003). The narrative accounts from the follow-up of the Glueck-sample portray the men as actively influencing the course of their criminal trajectories. While individual differences are important for human agency (Elder & O'Rand, 1995), agentic action induces a seemingly unpredictable component weakening both the link between propensity and behavior – even chronic offenders can choose to desist from crime – as well as that between life circumstances and crime – while turning points are important, human choice is necessary to capitalize on the opportunities present (Sampson & Laub, 2005).

ing the teenage years (Moffitt, 1993, 1994). In any given population the aggregated age-crime curve thus results from both the ratio of persistent versus limited offenders in that population, and the pace at which especially the latter have undergone changes in life circumstances.

3 Age, crime, and life circumstances

In their recently published book 'Shared beginnings, divergent lives' Laub and Sampson (2003) address several of the issues above. In this landmark study the authors build on their previous work on the men studied by the Gluecks (Sampson & Laub, 1993). By reconstructing the criminal careers of these men from their childhood years in Boston all the way up to age 70, Laub and Sampson for the first time provide an individual level account of the development of crime over nearly the entire life course. Laub and Sampson find that the age-crime relationship is not invariant for all offenders. Using the trajectory approach developed by Nagin (1999) they find a number of homogeneous groups of offenders following distinct developmental pathways (Sampson & Laub, 2003b). However, unlike predicted by typological theories, and contrary to earlier findings from other longitudinal studies (e.g., D'Unger, Land, McCall, & Nagin, 1998; Piquero, MacDonald, & Parker, 2002; Raskin White, Bates, & Buyske, 2001), no group showing a flat trajectory is found. Offending declines with age for all offender groups, even those offending at a high rate. From this Laub and Sampson conclude that desistance is the norm. According to Laub and Sampson the absence of a continuously flat trajectory is a central finding previously overlooked as a result of the limited age-span of most longitudinal studies of crime (Laub & Sampson, 2003: 105). The erroneous idea of a life course persistent group thus can be attributed to the middle-adulthood censoring of observations in the major longitudinal studies.

Next, Laub and Sampson ask whether important changes in life circumstances act as 'turning points' in the development of crime over the life course. Based on the Glueck-data, complemented with face-to-face interviews using life history calendars, professional, military, and marital history were reconstructed for a small subset of men (N=52). Using hierarchical models – allowing them to simultaneously model within-individual change and between individual 'propensity' differences in crime – they find that changes in the event rate of crime are systematically related to changes in life circumstances. When in states of employment, military service, or marriage, men are less likely to commit crimes. Their results are in line with those of previous studies – both quantitative and qualitative – that have found work (Horney, Osgood, & Marshall, 1995; Shover, 1996; Uggen, 2000), military service (Allen Bouffard, 2003; Mattick, 1960; but see: Wright,

3. Recently however, Wright et al. (Wright, Caspi, Moffit, & Silva, 2001) have argued that the effects of life circumstances are more pronounced for those high on criminal propensity. Their displayed optimism in that "severely crime-prone youth is deterred from crime by strong, prosocial ties" (p. 343), to us, seems to be at odds with earlier writings on the dual taxonomy in which it was argued that "opportunities for change will often be actively transformed by life-course-persistents into opportunities for continuity...this anticipates disappointing outcomes when such antisocial persons are thrust into new situations that purportedly offer the chance to turn over a new leaf (Moffitt, 1997: 23). Our models test the merits of both positions.

Carter, & Cullen, 2005), and marriage (Farrington & West, 1995; Horney et al., 1995; Piquero et al., 2002; Warr, 1998) to inhibit criminal behavior (for a comprehensive review see: Sampson & Laub, 2003a).

Finally, Laub and Sampson address the question whether, based on individual and childhood differences, different types of offenders following distinct developmental trajectories can be identified prospectively. Despite the richness of the available data on personal characteristics, family circumstances, and juvenile delinquency, Laub and Sampson find it impossible to a priori predict offender group membership. They conclude: "While childhood prognoses are modestly accurate in predicting level differences, they do not yield distinct groupings that are valid prospectively" (p. 112). This finding corroborates earlier studies that showed that trajectory-specific predictors were scarce (Chung, Hill, Hawkins, Gilchrist, & Nagin, 2002; Fergusson, Horwood, & Nagin, 2000), however other studies have shown both common and trajectory-specific correlates (Weisner & Capaldi, 2003; White, Bates, & Buyske, 2001).

4 Limitations of prior research and current focus

Although prior developmentally oriented criminological research has made headway in our understanding of the effects of age, life circumstances and offender type on the likelihood of committing offences over the life course, several limitations should be noted. First, as Laub and Sampson (2003) note, the majority of the longitudinal studies only cover a limited period of the entire lifespan (see for a review: Thornberry & Krohn, 2003). As a result, and contrary to the impression given by typological labels, not a great deal is known about the long term development of crime in middle and late adulthood. Second, few studies account for incarceration time. Piquero and colleagues (Piquero et al., 2001) show that not controlling for incarceration time can have serious consequences when estimating offending trajectories. Since frequent offenders are more likely to be incarcerated, not controlling for incarceration time results in underestimating their frequency of offending, classifying them as less chronic, or even desisting offenders. Finally, the problem of 'false desistance', individuals having no criminal records due to death, is largely overlooked (Eggleston, Laub, & Sampson, 2004; Piquero, Farrington, & Blumstein, 2003). False desistance particularly poses problems when mortality is not equally distributed among offender types. Prior research, including that on the Glueck-data indicates that this is the case (for a review see: Laub & Vaillant, 2000).[4]

While the Laub and Sampson study deals with these problems to a large extent, it too, like any other study, has its weaknesses. First, Laub and Sampson are only able to control for incarceration time for the entire sample up to age 32 (see also: Eggleston et al., 2004). Given that prior criminal records play a major role in judicial decision-making (Clancy, Bartolomeo, Richardson, & Wellford, 1981), the average length of incarceration can be expected to be positively associated with age, especially for high frequency offenders. Second, their study pertains to a sample of high-risk men who are probably not representative for the entire offender population. This may affect the external validity of the

4. Preliminary results also suggest that in the CCLS-sample, mortality is also positively related to offending frequency (Nieuwbeerta & Deerenberg, 2004).

obtained results. Third, Laub and Sampson do not analyze parenthood as a separate transition exerting its own influence on crime. Although becoming a parent was not a significant factor in explaining desistance up to age 32 (Sampson & Laub, 1993), the life history narratives of the men collected during the second follow-up suggested that parenting was important in desisting from crime (Laub & Sampson, 2003: 135). Furthermore, the influence of having children on offending may depend on whether these children were born in or out of wedlock (Farrington & West, 1995). Life courses are structured by social timetables for the occurrence and sequence of events (Elder, 1992). Social timing is a normative concept referring to cultural expectations regarding the order of life course transitions (Hagestad & Neugarten, 1985). Some changes in life circumstances, like having a child when unmarried, can be 'out of order', according to conventional expectations. Such 'out of order' changes can, instead of providing pathways to adult status, have advert effects that start of a train of negative events and influences that constrain conventional behavior (Elder, 1998). Finally, while Laub and Sampson do allow personal differences to influence the level of offending, their models do not allow for personal differences to influence the effects of life circumstances. Hence, they do not test the hypothesis based on typological theories assuming that the effects of life circumstances are different for different kinds of offenders.

The present study builds on earlier research and aims to overcome some of its shortcomings in a number of ways. First, we use longitudinal data on both an offender and a general population sample to analyze within individual changes in crime over almost the entire life course, namely between the ages of 10 and 70. This enables us to track changes in individual offending rates in middle and late adulthood and thus allows a more adequate test of criminological typologies. Second, we control for individual differences in exposure time due to incarceration or death thereby overcoming problems of false desistance. Third, both datasets pertain to a large, nationally representative sample and consist of both men and women. Finally, apart from marital history our data contain information on fertility, and employment history, so we are able to include a large array of life circumstances that may play a role in the development of crime over the life course.[5] In addition, data on marriage and fertility were combined in to six distinct states – unmarried with or without children, married with or without children, and separated with or without children – to capture cultural expectations regarding the order of these life course transitions.

5 Hypotheses

Four hypotheses on the relationship between age, crime and life circumstances are examined. The first hypothesis predicts that the age-crime relationship at the individual level is due to a unitary aging process and that no substantive variety in the shape of this relation-

5. Sampson and Laub (1993; Laub et al., 1998) argued that what is most important in inhibiting criminal behavior is not being married or having a job as such, but the attachment or level of involvement. Unfortunately, our data do not contain such information. However, as do others (Horney et al., 1995; Nagin & Paternoster, 1994; Piquero, Brame, Mazerolle, & Haapanen, 2002), we think of being married or having a job as signaling some basic level of social bonding. In addition the latest analysis by Laub & Sampson of the Glueck data using similar 'participation' measures has yielded results comparable to those of their earlier studies (Laub & Sampson, 2003).

ship between individuals exists (Hirschi & Gottfredson, 1995). Assuming that opportunities for crime are equally distributed among age groups, a very strict interpretation of static theories would lead to this conclusion. Differences in criminal propensity are only expected to lead to differences in the likelihood of committing a crime, not in the way that likelihood develops across the life span. Dynamic as well as typological theories on the other hand would expect individuals to differ in their criminal trajectories due to between individual differences in the temporal distribution of life circumstances and – in case of typological theories – differences in etiology.

Second, we compare static and dynamic theories by asking to what extent life circumstances significantly influence crime. Static theories predict that the likelihood of offending is hardly (if at all) affected by changes in life circumstances taking place after childhood and that any association between life circumstances and offending is caused by the individual's underlying criminal propensity (Hirschi & Gottfredson, 1995). Dynamic theories however state that, even when individual differences in criminal propensity are accounted for, a significant effect of life circumstances on offending remains.

Third, we test the hypothesis that enduring individual differences are associated with different developmental trajectories. Whereas static and dynamic theories do not expect the age-crime relationship to systematically vary between groups of offenders, typological theories do (Paternoster & Brame, 1997). If typological theories are correct, variables indicating enduring individual differences should interact with the effects of age on crime. More specifically, based on the distinction between persistent and more limited offenders made by prominent typological theories, variables indicating high criminal propensity – like an early onset of problem behavior – are expected to be associated with a less steep decline in crime during adulthood (Moffitt, 1993).

The fourth and final hypothesis concerns the impact life circumstances have on the criminal behavior of different types of offenders. Dynamic theories argue that there is a common explanation of crime (Laub & Sampson, 2003: 112; Paternoster & Brame, 1997: 57). These theories therefore expect the effect of life circumstances on crime to be the same for all offenders. Typological theories on the other hand argue that unique causal processes explain the criminal trajectories of different types of offenders and that the effect of later life circumstances is marginal for those whose childhood development was compromised (Moffitt, 1997).

In sum, we test what level of theoretical complexity is needed to best explain the age-crime relationship at the individual level. In the final step of our analysis we use our findings at the individual level to explore the extent to which the age-crime curve at the aggregate level results from the direct effects of age, age-graded changes in life circumstances, and between individual differences in offending trajectories.

6 Data and methods

To test the hypotheses regarding the age-crime relationship the present study uses conviction history data as well as self-reports. Neither self-report, nor official data constitute a 'true' measure of an individuals' criminal behavior (Farrington, 1986; Junger-Tas & Marshall, 1999). Official data have the advantage that they do not rely on memory. Not only are more frequent events more easily forgotten, mistakes in the temporal sequence of

events are also often made (Bradburn, Rips, & Shevell, 1987; Horney & Marshall, 1991; Visher, 1986). The major advantage of using self-reports is that respondents report more crimes than become known to the police. Furthermore, self-report data do not suffer from possible offence or offender-bound difference in the chances of being prosecuted (Hawkins, Laub, & Lauritsen, 1998). By using both kinds of data we come to a more adequate test of our hypotheses.

6.1 Study 1

The first data set used in the present study is compiled from the large-scale 'Criminal Career and Life-course Study (CCLS) that is being carried out at the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR) (Nieuwbeerta & Blokland, 2003). This project uses a representative sample of 4% of all cases of criminal offences that were tried in the Netherlands in 1977 (this project builds on the work of Block & Van der Werff, 1991; Van der Werff, 1986).[6] The number of cases for drunk driving being disproportionably high, the sample for this type of offence was confined to 2%. In order to be able to make reliable statements on a number of less common – mainly serious – offences these crimes were oversampled. This additional sample consisted of 25% of all (attempted) robbery, public violence and battery cases, 100% of all cases involving (attempted) murder, offence against decency, rape, child molesting, and other sexual assaults and 17% of all drug offences. Together the initial 4% sample and the additional sample consist of 5,164 individuals. In analyzing the data a weight factor was used to account for the stratification of the sample. The weighted sample thus again represents the distribution of offence types as they were tried in 1977.

Abstracts from the General Documentation Files (GDF) of the Criminal Record Office ('rap sheets') were used to reconstruct the entire criminal careers of the CCLS-sample. The GDF contain information on every criminal case registered by the police at the Public Prosecutor's Office. These abstracts were supplemented with cases that normally would not be mentioned due to periods of limitation. While the GDF contain information on all offences that have lead to any type of judicial interference, here we choose to use only information on those offences that were actually followed by a conviction or a prosecutorial disposition due to policy reasons, thereby excluding cases that resulted in an acquittal or a prosecutorial disposition due to insufficient evidence. In this way all convictions before 1977 as well as any convictions in the period 1977–2002 were recorded.[7] Since the mean age of the sample in 1977 was 28 (ranging from 12 to 65), these data reach far into adulthood for the larger part of the sample. Data on incarceration were also obtained from the GDF extracts. Within each year-period, individuals were coded 'free on the street' for the number of months that they were not incarcerated, with a minimum of one month per year to account for offences perpetrated while on leave or detention in a semi-secure institution.[8]

Data on life circumstances were collected from population registration data (GBA). Since 1938 all citizens in the Netherlands are registered in their municipalities. Personal

6. All cases ruled upon by a judge and all cases waivered by the Public Prosecutor for policy reasons or for technical reasons – for example due to failing evidence.
7. Note that in the Netherlands a person is not given a 'blank sheet' upon becoming an adult. The extracts used thus contain information on both juvenile and adult offences.

records in the population registration contain information on marriage and fertility history and date of death. Prior to electronic registration, that is prior to 1994, personal record cards were used that were sent to the next town of living every time a person moved. For our analysis individuals who had died before 1994 personal record cards were retrieved from the Centre for Genealogy and Heraldry. Based on the personal details from 1977 we were able to trace 90,7% of the sample in this way, leaving a CCLS-sample of 4,684 individuals. Nearly two thirds of the final sample had been married at least once; 39% of these marriages ended in divorce. By the year 2002 17% of the sample had died.

Following prior research (Horney et al., 1995; Laub & Sampson, 2003: 256) we centered all time varying covariates – except age – around each persons adult-mean. Since the age structure of our sample differs from that of a regular birth cohort, we based the adult-mean on the period between age 12 and 50.[9] To analyze change within individuals we then examine deviations in any given year from each person's adult-mean. By centering the time varying covariates in this way, we are able to account for the possibility that some individuals are more prone than others to experience a given life circumstance (an argument of static theories) (Laub & Sampson, 2003).

Generally men are thought to be more crime prone than women. Furthermore, typological theories state that an early onset is predictive for the persistence of problematic behavior later in life (Moffitt, 1997; Tolan & Lorion, 1988). Therefore, in the present effort we use the combination of sex and age at first conviction as indicative of stable individual differences between offender types. Males constituted 90% of the sample; 16% of the males were convicted before age 16 and were labeled 'early onsetters'. Only 5% of the women in the sample were categorized as having experienced an early onset of their criminal career.[10]

Based on these data a person-period file was constructed in which every record contains information on the number of convictions for each individual in each year, as well as information on all relevant covariates. Since only few people in the CCLS-sample had reached an age over 72 by the year 2002, only information on the ages 12 to 72 was included in the analyses. The fully constructed data-file contains information for 194,150 person-years for 4,684 individuals.

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8. The way we adjusted for exposure time does not allow for the number of months per year an individual is exposed to be zero: i.e. $ln(0)$ cannot be included in the equation (see section 6.3). However, under Dutch penal regime many convicts are allowed (un)accompanied leave during a large part of their sentence. Even those offenders sentenced to a year (or more) in prison can thus be expected to be at risk of offending for some short period. We tried several time periods in the analysis besides one month – days, weeks – but this did not substantially affect our results.
9. In case the individual died before age 50 or did not reach age 50 in our observation period, the adult mean was calculated on the remaining number of years.
10. Other studies using official data have often defined early onset as those incurring their first police contact prior to age fourteen (e.g., Paternoster, et al., 1997; Piquero & Chung, 2001). However, since the CCLS is based on conviction data and the minimum age of legal responsibility in the Netherlands is 12 years of age, individuals first convicted before age 16 constitute the lowest 10% of the age of onset distribution in the CCLS-sample. This is in line with the size of the persistent offender group as predicted by Moffitt (1993). We therefore feel that, given the restrictions of the data, our measure of early onset to a large extent captures the basic idea behind typological theories.

6.2 Study 2

The second data set used here is from a Dutch national crime survey conducted in 1996 by the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR). These data were collected by using a multistage cluster sampling procedure to obtain a nationally representative sample of the Dutch population age 15 years or older (N = 1,939), oversampling those between 15 and 30 years old (N = 1,012) leaving a total sample of 2,951 individuals. A weight factor was used in all analyses to control for the oversampling of 15 to 30 year olds. In a private setting one-hour-long face-to-face interviews were conducted using a computer to allow the respondent to directly type in the responses (CAPI). Wittebrood and Ter Voert (1997) provide a detailed discussion of the sampling design and data collection issues (see also: Wittebrood & Nieuwbeerta, 1999, 2000).

During the interviews respondents were asked to fill out a life history calendar of major life events (Caspi, Moffitt, Thornton, & Freedman, 1996). In this way information was collected about the respondents marital, fertility, and employment history. Nearly two thirds of the sample indicated that they were married without having children at least for one year in the past 25 years. In addition, 45% indicated having simultaneously experienced marriage and parenthood. Relatively few respondents experienced a divorce. Finally, 65% of the respondents indicated to have been employed at least once. Respondents – working or in the military – were assigned an occupational status according to a measure provided by Ganzeboom and Treiman (1996). As in study 1, all time varying covariates with the exception of age were centered around each respondent's adult-mean.

Subsequently respondents had been asked if they had ever committed 17 distinct types of offences, with the previously completed life history calendar used as a reference to facilitate recall.[11] Those respondents who indicated to have committed a certain type of offence were asked to recall the year in which the most recent incident had taken place. Respondents were then asked whether they had previously committed that kind of offence and in which year that had happened. This question was repeated for every type of crime until all offences had been registered.[12] If necessary, multiple offences per type could be recorded each year. Annual offence rates were computed by adding up the total number of offences reported in any given year. Because the latter questions were expected to be more apt to produce socially desirable responses if the respondent had to answer the interviewer in person, the respondents could fill out this part of the questionnaire themselves on the computer, without the interviewer being able to see. Because of reliability we not only limit self-report data to the ages between 12 and 72, but also limit the retrospective period to 25 years. To further control for possible memory decay, a variable representing the number of years elapsed since the years to which the information referred was included in all models pertaining to the self-report data. The resulting weighted sample for this study consists of 2,244 individuals. The person-period file based on the survey data contains 47,446 person-years from 2,244 individuals with the self-reported number of offences committed as the dependent variable.

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11. Offence types asked about included: various forms of theft, fencing, threat, (aggravated) assault, various forms of fraud, and drunk and hit-and-run driving.
12. Recall errors using a life history calendar tend to be less for personal and family experiences, but greater for chronic and routine events (Lin Ensel & Lai Wan Foon, 1997).

In addition to the personal interview, a pen and paper questionnaire regarding their childhood experiences was left behind by the interviewer for the respondent to fill in individually afterwards. One of the items in this questionnaire asked whether the respondent had experienced any serious difficulties with adults in the household regarding the respondent's behavior before age ten. If this was the case, this was deemed indicative of the respondent showing an early onset of problem behavior.[13] Troublesome behavior at age 10 has proven to be an important risk factor for chronic criminal behavior (Farrington & West, 1993). Models including indicators of an early onset are based on the 2,185 individuals who returned the written questionnaire. Women constitute over half of the sample. Of these women 4% reported serious behavioral difficulties during childhood compared to 6% of the men. The person-period file for models including an indicator of an early onset of problem behavior consists of 38,047 years for 2,185 individuals.

6.3 Analysis Methods

The major aim of this study is to distinguish dynamic from static influences on the development of crime over time. We therefore use hierarchical or multi-level models for nested or repeated measures data in which differences in crime event rates between years *within* individuals are represented at level 1 and differences *between* individuals at level 2. These models have become widely used in the analysis of criminal careers and life events (Horney et al., 1995; Laub & Sampson, 2003; Layton MacKenzie & De Li, 2002; see also: Wittebrood & Nieuwbeerta, 1999; 2000). In these models, random effects at level 2 account for variation between individuals unexplained by the structural model. These models are especially suited for our purpose because, when estimating coefficients, interdependence of observations within individuals is adjusted for by taking into account the correlation of the error components of the various levels. Time-varying covariates can be incorporated in the level 1 model, enabling us to estimate the effects of life circumstances while controlling for (un)observed individual (propensity) differences. We use negative binomial models in the analyses of our data. These models were especially designed for event count data such as ours (Greene, 1997). Negative binomial models elaborate on simpler Poisson models by allowing for over-dispersion, that is the relative rarity of a criminal event taken place in any given year, even in the CCLS-sample.

13. The overall response rate for this questionnaire was 74%. People with a low educational level (both the above 15 and the 15 to 30 year sample) and people who were single, were attending day school or had been a victim of crime in the year prior to the survey sent the questionnaire back less frequently than those who had a higher education level, were married or cohabitating, were not in school or were not victimized in 1995. Given the large number of variables that did not show significant differences, clearly taking part in the survey was only selective to a small extent (Wittebrood & Ter Voert, 1997).

To test our hypotheses we estimate four hierarchical models. In the simplest model, model I, the number of crimes in a given year is specified as a function of age:

$$\ln(Crime_{ij}) = \eta_{ij} + e_{ij} = \beta_{0j} + \beta_{1j}AgeI_{ij} + \beta_{2j}AgeII_{ij} + \ln(Free_{ij}) + \varepsilon_{ij}$$

(I)
$$\beta_{1j} = \gamma_{10} + \mu_{1j}$$
$$\beta_{0j} = \gamma_{00} + \mu_{0j}$$
$$\beta_{2j} = \gamma_{20} + \mu_{2j}$$

where $Crime$ represents the expected number of offences committed in year i by individual j and the relationship between age and crime is given by the β's. Following Piquero et al. (2001) the natural logarithm of the exposure time (in months) is incorporated into the model to adjust for the amount of time individual j was actually 'free' to offend in year i.[14]

In their analyses of the development of crime in the lives of the Glueck men, Laub and Sampson use a second order model to represent the age-crime curve. However, due to the asymmetric nature of the observed crime counts, the predicted peak age of offending is pulled seven years to the right (Laub & Sampson, 2003: 257). To overcome this problem we specify crime as a continuous piece-wise linear function of age with two intervals (Snijders & Bosker, 1999). The slopes of these continuous functions may change discontinuously at a number of values of i called *nodes*, but are linear (and hence have constant slopes) between these nodes. By choosing the node in our model so that it coincides with the observed peak age of offending[15], β_{0j} represents the estimated number of offences at the peak age. Change parameter β_{1j} can be interpreted as the annualized rise in the number of offences up till peak age, while β_{2j} indicates the annualized rate of desistance. In the between-individual model (level 2) the γ-parameters represent the fixed effects of age. μ_{0j} represents the variation in crime attributable to stable unobserved individual characteristics. Between-individual differences in the rise and decline in the event rate of crime are depicted by μ_{1j} and μ_{2j} respectively. If static theories are correct and the age effect is largely invariant there should only be meaningful variation between individuals in μ_{0j}; dynamic and typological theories also expect μ_{1j} and μ_{2j} to differ between individuals.

Model II enters q time-varying indicators of life circumstances to test the dynamic hypothesis that life circumstances influence crime, even when unobserved individual differences in criminal propensity are taken into account:

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14. A variable *Memory* was also included at the within-person level in the models pertaining to the self-report data.

15. This is accomplished by defining $AgeI$ as: $AgeI = \begin{cases} age_j - age_{peak} & (age_j < age_{peak}) \\ 0 & (age_j \geq age_{peak}) \end{cases}$

and $AgeII$ as: $AgeII = \begin{cases} age_j - age_{peak} & (age_j < age_{peak}) \\ 0 & (age_j \geq age_{peak}) \end{cases}$

$$\ln(Crime_{ij}) = \eta_{ij} + e_{ij} = \beta_{0j} + \beta_{1j}AgeI_{ij} + \beta_{2j}AgeII_{ij} + \sum \beta_{qj}LC_{qj} + \ln(Free_{ij}) + \varepsilon_{ij}$$

(II)
$$\beta_{0j} = \gamma_{00} + \sum \gamma_{0qj}LC_{qj} + \mu_{0j}$$
$$\beta_{1j} = \gamma_{10} + \sum \gamma_{1qj}LC_{qj} + \mu_{1j}$$
$$\beta_{2j} = \gamma_{20} + \sum \gamma_{2qj}LC_{qj} + \mu_{2j}$$

To capture the notion of social timing we distinguished six 'life course-states' based on marital and fertility data. Six dummy variables were created to indicate whether in a given year an individual was either unmarried without children, unmarried with children, married without children, married with children, separated without children, or separated with children. To estimate the simultaneous association of the mean time spent in a certain life circumstance and crime, individual means for the different life circumstances are included at the between individual level (level 2) (Horney et al, 1995). The effects of life circumstances on crime are thus decomposed in a time-varying, dynamic element, and a static element. While common practice in developmental criminological research (Horney et al., 1995; Laub & Sampson, 2003) decomposing the effects of life circumstances in their time-stable and time-varying components deserves caution. By making present offending behavior depend on future life circumstances, causality is reversed. This is especially problematic when present offending is likely to affect future life circumstances. Decomposing the effects of life circumstances is thus best seen as a way to prevent overestimating the time-varying effects of life circumstances, when no direct measures of criminal propensity are available.

In model II $\sum \gamma_{0\text{-}2qj}LC_{qj}$ represent the effect of between-individual differences in average life circumstances, while $\sum \beta_{qj}LC_{qj}$ indicates the effect of within-individual change in these life circumstances. Unlike static theories, dynamic theories predict significant effects of the time varying component of life circumstances β_{qj}.

In model III, an additional explanatory variable for stable personal characteristics (PC) indicating offender group membership is added to the between-individual equations (level 2).[16] This enables us to test the typological hypothesis stating that the age crime relationship varies across offender types:

16. Typological theories would expect different offender types also to differ in the age at which their offence rate reaches a peak. Observed offence rates show this to be the case here. Since the continuous piece wise model used here only allows for variation in height and slope between offender groups, we choose the node (i.e. the peak) in the model separately for each offender type, based on their observed peak age of offending. This substantially enhances the fit of the model.

$$\ln(Crime_{ij}) = \eta_{ij} + e_{ij} = \beta_{0j} + \beta_{1j}AgeI_{ij} + \beta_{2j}AgeII_{ij} + \sum \beta_{qj}LC_{qij} + \ln(Free_{ij}) + \varepsilon_{ij}$$

(III)
$$\beta_{0j} = \gamma_{00} + \sum \gamma_{0qj}LC_{qj} + \sum \gamma_{0tj}PC_{tj} + \mu_{0j}$$
$$\beta_{1j} = \gamma_{10} + \sum \gamma_{1qj}LC_{qj} + \sum \gamma_{1tj}PC_{tj} + \mu_{1j}$$
$$\beta_{2j} = \gamma_{20} + \sum \gamma_{2qj}LC_{qj} + \sum \gamma_{2tj}PC_{tj} + \mu_{2j}$$

where $\sum \gamma_{0tj}PC_{tj}$ represents the effect of offender type on the event rate of crime, and $\sum \gamma_{1tj}PC_{tj}$ and $\sum \gamma_{2tj}PC_{tj}$ represent the effect offender type has on the rate by which crime rises and falls during the life span. Based on typological theories it is expected that males experiencing an early onset of problematic behavior are most likely to persist in crime and therefore show less desistance as they age compared to other offender groups.

Finally, a fourth model is applied which allows the impact of life circumstances to vary for early and late onsetters. In addition to the PC variable that denoted group membership based on timing of onset *and* sex, a variable EO is created denoting an early onset (regardless of sex) that is coded 1 for early onset males and early onset females and 0 for late onset males and females. Model IV includes variables indicating the interaction between the various time varying life circumstances and the EO-variable:

$$\ln(Crime_{ij}) = \eta_{ij} + e_{ij} = \beta_{0j} + \beta_{1j}AgeI_{ij} + \beta_{2j}AgeII_{ij} + \sum \beta_{qij}LC_{qij} + \sum \beta_{r}(EO_{ij} * LC_{qij}) + \ln(Free_{ij}) + \varepsilon_{ij}$$

(IV)
$$\beta_{0j} = \gamma_{00} + \sum \gamma_{0qj}LC_{qj} + \sum \gamma_{0tj}PC_{tj} + \mu_{0j}$$
$$\beta_{1j} = \gamma_{10} + \sum \gamma_{1qj}LC_{qj} + \sum \gamma_{1tj}PC_{tj} + \mu_{1j}$$
$$\beta_{2j} = \gamma_{20} + \sum \gamma_{2qj}LC_{qj} + \sum \gamma_{2tj}PC_{tj} + \mu_{2j}$$

Dynamic theories predict that the effects of life circumstances are the same for all groups. Typological theories on the other hand expect variation in these effects between groups, with early onset (persistent) individuals being the least affected.

7 Results

Of all the individuals in the CCLS-sample 96% is convicted at least once (Table 1). The remaining 4% were acquitted or had their case waivered by the Public Prosecutor for technical reasons. Almost one fifth (18.4%) of the CCLS-sample is convicted one-time only, 13.4% is convicted twice. Over two thirds (68.1%) is convicted for three or more offences, with a maximum of 185. Being a population sample, the prevalence of offending in the self-report sample is much less: 42% reported at least one offence over their life course. Of those reporting an offence nearly half (47.4%) report only one, 19.9% report two offences, and 32.7% report having committed three offences or more.

Multi-level Models

Tables 2 and 3 show the numerical values of the parameter estimates for the models I, II, III, and IV. In these models the intercept represents the natural logarithm of the annualized offending rate at the peak age, under the assumption that the control variables $Free_{ij}$ (in the CCLS-data) and $Memory_{ij}$ (in the crime survey data), have a value of zero.[17] In models II, III and IV the intercept refers to the annualized offending rate at the peak age for someone in the reference category. In model II, individuals who remain single and childless (and unemployed) during their entire life constitute the reference category. In model III and IV the reference category is narrowed to males showing a late onset of problem behavior under these conditions. Parameter estimates and their exponents indicate the factor by which the offending rate changes as a result of changes in age, life circumstances, and enduring individual characteristics.

Variance in the Age Crime Relationship

Under the static assumption that the age-crime relationship at the individual level is due to a unitary aging process, no substantive variety in the rise or decline in crime over the life span is expected. The significance of the intercept variance in model I indicates that there is substantial individual variation in the overall event rate of crime; some people are thus more likely to commit an offence than others. Moreover, both slope variances are highly significant as well. This indicates that there are also considerable differences in the rate at which people offend during their lives. These results speak in favor of dynamic and typological theories in that they show there to be between-individual variation in criminal trajectories.

17. In the CCLS-data a '0' on the variable *Free* indicates that person is incarcerated that entire year. The expected number of convictions based solely on the intercept therefore is effectively zero.

Table 1 Means and Standard Errors of the Variables Used

	CCLS (N=4,684 individuals)			CCLS (N= 194,1501 years)		NSCR-survey (N=2,244 individuals)		NSCR-survey (N=47,446 years)	
Variable	mean		s.e.	mean	s.e.	mean	s.e.	mean	s.e.
Dependent variable									
Offence	0-29			0.26	0.86			0.05	0.26
Independent variables									
Age	12-72	32.22	4.87	33.37	13.83	33.38	14.65	35.6	15.2
Unmarried. no child betw. age 12-50	0-1	0.35	0.36	0.46	0.27	0.38	0.39	0.30	0.35
Unmarried. child betw. age 12-50	0-1	0.06	0.18	0.03	0.12	0.00	0.05	0.01	0.05
Married. no child betw. age 12-50	0-1	0.11	0.17	0.10	0.14	0.18	0.23	0.20	0.24
Married. child betw. age 12-50	0-1	0.33	0.32	0.30	0.25	0.37	0.38	0.43	0.38
Seperated. no child betw. age 12-50	0-1	0.05	0.13	0.03	0.10	0.01	0.07	0.01	0.07
Seperated. child betw. age 12-50	0-1	0.10	0.19	0.07	0.14	0.01	0.08	0.02	0.09
Student betw. Age 12-50	0-1					0.26	0.34	0.18	0.27
Job betw. age 12-50	0-1					0.46	0.39	0.51	0.39
Status betw. age 12-50	0-1					27.94	14.29	29.08	14.3
Ubanization betw. Age 12-50	0-4					1.87	1.27	1.97	1.36
Unmarried. no children	0-1	0.99	0.12	0.43	0.49	0.62	0.48	0.30	0.46
Unmarried. children	0-1	0.13	0.36	0.03	0.18	0.01	0.12	0.00	0.07
Married. no children	0-1	0.64	0.49	0.14	0.34	0.76	0.43	0.29	0.46
Married. children	0-1	0.67	0.48	0.27	0.44	0.61	0.49	0.35	0.48
Seperated. no children	0-1	0.26	0.44	0.07	0.25	0.1	0.31	0.03	0.18
Seperated. children	0-1	0.30	0.46	0.07	0.26	0.06	0.23	0.01	0.12
Student	0-1					0.51	0.5	0.18	0.38
Job	0-1					0.72	0.45	0.48	0.50
Status	18-68					42.53	9.77	42.42	10.20
Urbanization	1-4					2.41	1.35	1.97	1.36

Table 1 (Continued)

	CCLS (N=4,684 individuals)			CCLS (N= 194,1501 years)		NSCR-survey (N=2,244 individuals)		NSCR-survey (N=47,446 years)	
Variable	mean		s.e.	mean	s.e.	mean	s.e.	mean	s.e.
Early onset male	0-1	0.16	0.37	0.14	0.35	0.06	0.24	0.06	0.23
Early onset female	0-1	0.00	0.08	0.00	0.06	0.04	0.19	0.04	0.19
Late onset male	0-1	0.74	0.44	0.75	0.43	0.38	0.48	0.37	0.48
Late onset female	0-1	0.09	0.29	0.10	0.30	0.52	0.50	0.51	0.50
Control variables									
Incarceration	0-1	0.05	0.11	0.05	0.21				
Time spent incarcerated	0-360	52.71	53.67	78.93	81.86				
Memory	1-25							12.21	7.07

Table 2 Developments in Officially Recorded Crime over the Life Course. Explained by Age. Life Circumstances and Individual Characteristics

		Model I				Model II				Model III				Model IV			
		b		S.E.	exp(b)	b		S.E.	exp(b)	b		S.E.	exp(b)	b		S.E.	exp(b)
Fixed effects																	
Age-crime curve																	
γ_{00}	Intercept	-2.567	***	0.031	0.077	-2.207	***	0.038	0.110	-2.310	***	0.041	0.099	-2.307	***	0.041	1.042
γ_{10}	Age I	0.400	***	0.007	1.492	0.396	***	0.007	1.486	0.390	***	0.007	1.477	0.396	***	0.007	1.007
γ_{20}	Age II	-0.051	***	0.002	0.950	-0.040	***	0.002	0.961	-0.051	***	0.002	0.950	-0.051	***	0.002	1.002
Stable average life circumstances																	
	Unmarried. no child betw. age 12-50					(ref.)		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
γ_{01}	Unmarried. child betw. age 12-50					0.382	***	0.115	1.465	0.562	***	0.119	1.754	0.559	***	0.118	1.749
γ_{02}	Married. no child betw. age 12-50					-2.226	***	0.115	0.108	-1.943	***	0.120	0.143	-1.950	***	0.12	0.142
γ_{03}	Married. child betw. age 12-50					-1.995	***	0.063	0.136	-1.716	***	0.065	0.180	-1.710	***	0.065	0.181
γ_{04}	Seperated. no child betw. age 12-50					0.451	***	0.146	1.570	0.282	*	0.151	1.326	0.276	*	0.151	1.318
γ_{05}	Seperated. child betw. age 12-50					1.047	***	0.098	2.849	1.129	***	0.102	3.093	1.125	***	0.102	3.080
Time varying life circumstances																	
	Unmarried. no children					(ref.)		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
β_{30}	Unmarried. children					-0.049		0.074	0.952	-0.009		0.074	0.991	-0.100		0.085	0.905
β_{40}	Married. no children					-0.678	***	0.054	0.508	-0.520	***	0.055	0.595	-0.600	***	0.060	0.549
β_{50}	Married. children					-0.531	***	0.043	0.588	-0.416	***	0.044	0.660	-0.491	***	0.049	0.612
β_{60}	Seperated. no children					-0.511	***	0.074	0.600	-0.222	***	0.076	0.801	-0.233	***	0.084	0.792
β_{70}	Seperated. children					-0.040		0.061	0.961	0.165	***	0.062	1.179	0.150	**	0.069	1.162
Stable personal characteristics																	
γ_{06}	Early onset male									0.607	***	0.062	1.835	0.645	***	0.069	1.906
γ_{07}	Early onset female									-1.137	***	0.349	0.321	-1.133	***	0.350	0.322
	Late onset male									(ref.)		(ref.)		(ref.)		(ref.)	
γ_{08}	Late onset female									-1.498	***	0.089	0.224	-1.479	***	0.089	0.228

Table 2 (Continued)

Stable personal characteristics*Age I														
γ_{16}	Early onset male*Age I						0.575	***	0.052	1.777	0.536	***	0.052	1.709
γ_{17}	Early onset female*Age I						0.151		0.524	1.163	0.080		0.522	1.083
	Late onset male*Age I						(ref.)		(ref.)		(ref.)		(ref.)	
γ_{18}	Late onset female*Age I						-0.206	***	0.016	0.814	-0.207	***	0.016	0.813
Stable personal characteristics*Age II														
γ_{26}	Early onset male*Age II						0.019	***	0.003	1.019	0.016	***	0.004	1.016
γ_{27}	Early onset female*Age II						0.036	**	0.018	1.037	0.036	*	0.019	1.037
	Late onset male*Age II						(ref.)		(ref.)		(ref.)		(ref.)	
γ_{28}	Late onset female*Age II						0.012	**	0.006	1.012	0.011	*	0.006	1.011
Stable personal characterisitics*Life Circumstances														
	Early onset*Unmarried. no children										(ref.)		(ref.)	
γ_{39}	Early onset*Unmarried. children										0.379	**	0.174	1.461
γ_{49}	Early onset*Married. no children										0.382	***	0.143	1.465
γ_{59}	Early onset* Married. children										0.360	***	0.109	1.433
γ_{69}	Early onset*Seperated. no children										-0.019		0.199	0.981
γ_{79}	Early onset*Seperated. children										0.029		0.155	1.029
Random effects														
Level 2 (between individuals)														
μ_{0j}	Intercept variance	0.814	***	0.041	0.708	***	0.034	0.862	***	0.039	0.850	***	0.038	
μ_{1j}	Slope variance Age I	0.004	***	0.001	0.006	***	0.001	0.001	***	0.000	0.001	***	0.000	
μ_{2j}	Slope variance Age II	0.005	***	0.000	0.002	***	0.000	0.003	***	0.000	0.003	***	0.000	
Covariance														
Level 2 estimated covariance matrix														
τ_{01}	Intercept*Slope variance Age I	0.018	***	0.005	0.043	***	0.004	0.031	***	0.004	0.029	***	0.004	
τ_{02}	Intercept*Slope variance Age II	0.009	***	0.002	0.009	***	0.001	0.010	***	0.002	0.010	***	0.002	
τ_{12}	Age I*Age II	-0.001		0.000	0.002	***	0.000	0.000		0.000	0.000		0.000	
ε_{ij}		25.508	***	0.098	16.996	***	0.072	16.652	***	0.072	16.518	***	0.071	

Source: CCLS-data

*p<0.10;**p<0.05; ***p<0.01 N_{ind} = 4,684 ; N_{years} = 194,150 Incarceration time is accounted for in all models

Table 3 Developments in Self-Reported Crime over the Life Course. Explained by Age. Life circumstances and Individual Characteristics

		Model I				Model II				Model III				Model IV			
		B		S.E.	exp (b)	b		S.E.	exp(b)	B		S.E.		exp (b)		S.E.	exp (b)
Fixed effect																	
Age-crime curve																	
γ_{00}	Intercept	-1.133	***	0.075	0.322	-2.488	***	0.221	0.083	-1.473	***	0.218	0.229	-1.522	***	0.217	0.218
γ_{10}	Age I	0.019		0.013	1.019	0.039	***	0.016	1.040	0.022	***	0.012	1.022	0.016	***	0.012	1.016
γ_{20}	Age II	-0.048	***	0.004	0.953	-0.035	***	0.006	0.966	-0.044	***	0.007	0.957	-0.042	***	0.007	0.959
Stable average life circumstances																	
	Unmarried. no child betw. age 12-50					(ref.)		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
γ_{01}	Unmarried. child betw. age 12-50					0.612		0.941	1.844	1.099		0.807	3.001	1.106		0.806	3.022
γ_{02}	Married. no child betw. age 12-50					-0.177		0.230	0.838	0.433	**	0.209	1.542	0.443	**	0.209	1.557
γ_{03}	Married. child betw. age 12-50					-0.170		0.199	0.844	0.095		0.179	1.100	0.103		0.179	1.108
γ_{04}	Seperated. no child betw. age 12-50					1.233	**	0.601	3.432	1.556	***	0.539	4.740	1.568	***	0.536	4.797
γ_{05}	Seperated. child betw. age 12-50					1.060	*	0.624	2.886	1.466	***	0.611	4.332	1.461	***	0.609	4.310
γ_{09}	Student betw. age 12-50					1.364	***	0.23	3.912	0.605	***	0.215	1.831	0.598	***	0.214	1.818
γ_{010}	Job betw. age 12-50					1.573	***	0.292	4.821	0.130		0.271	1.139	0.119		0.270	1.126
γ_{011}	Status betw. age 12-50					-0.007		0.006	0.993	0.002		0.005	1.002	0.002		0.005	1.002
γ_{012}	Urbanization betw. age 12-50					0.058	*	0.032	1.060	0.068	***	0.028	1.070	0.068	***	0.028	1.070
Time varying life circumstances																	
	Unmarried. no children					(ref.)		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
β_{30}	Unmarried. children					0.336		0.416	1.399	0.260		0.417	1.297	0.252		0.451	1.287
β_{40}	Married. no children					-0.104		0.086	0.901	-0.150	*	0.089	0.861	-0.122		0.098	0.885
β_{50}	Married. children					-0.205	*	0.105	0.815	-0.219	**	0.107	0.803	-0.183		0.117	0.833
β_{60}	Seperated. no children					-0.439	*	0.224	0.645	-0.541	***	0.226	0.582	-0.673	***	0.258	0.510
β_{70}	Seperated. children					0.193		0.252	1.213	0.179		0.256	1.196	0.215		0.306	1.240
β_{80}	Student					-0.007		0.127	0.993	-0.092		0.124	0.912	-0.117		0.141	0.890
β_{90}	Job					-0.038		0.190	0.963	-0.056		0.191	0.946	0.084		0.214	1.088
β_{100}	Status					-0.002		0.004	0.998	-0.002		0.004	0.998	-0.004		0.005	0.996
β_{110}	Urbanization					0.015		0.035	1.015	0.019		0.035	1.019	0.046		0.039	1.047

Table 3 (Continued)

		Model I			Model II			Model III			Model IV		
		B	S.E.	exp (b)	b	S.E.	exp(b)	B	S.E.		exp (b)	S.E.	exp (b)
Stable personal characteristics													
γ_{06}	Early onset male							0.942 ***	0.189	2.565	0.942 ***	0.19	2.565
γ_{07}	Early onset female							-0.400	0.261	0.670	-0.263	0.263	0.769
	Late onset male							(ref.)	(ref.)		(ref.)	(ref.)	
γ_{08}	Late onset female							-0.771 ***	0.128	0.463	-0.723 ***	0.129	0.485
Stable personal characteristic *Age I													
γ_{16}	Early onset male*Age I							0.369 ***	0.123	1.446	0.409 ***	0.125	1.505
γ_{17}	Early onset female*Age I							0.032	0.053	1.033	0.066	0.055	1.068
	Late onset male*Age I							(ref.)	(ref.)		(ref.)	(ref.)	
γ_{18}	Late onset female*Age I							0.164 *	0.095	1.178	0.16	0.096	1.174
Stable personal characteristic *Age II													
γ_{26}	Early onset male*Age II							-0.003	0.013	0.997	0.000	0.013	1.000
γ_{27}	Early onset female*Age II							-0.022	0.023	0.978	-0.027	0.023	0.973
	Late onset male*Age II							(ref.)	(ref.)		(ref.)	(ref.)	
γ_{28}	Late onset female*Age II							-0.005	0.009	0.995	-0.008 ***	0.009	0.992
Stable characteristic *life circumstances													
	Early onset*Unmarried. no children												
γ_{39}	Early onset*Unmarried. children										0.147	1.142	1.158
γ_{49}	Early onset*Married. no children										-0.152	0.224	0.859
γ_{59}	Early onset* Married. children										-0.158	0.271	0.854
γ_{69}	Early onset*Seperated. no children										0.441	0.542	1.554
γ_{79}	Early onset*Seperated. children										-0.091	0.558	0.913
γ_{89}	Early onset*Student										0.139	0.285	1.149
γ_{99}	Early onset*Job										-0.464	0.491	0.629
γ_{109}	Early onset*Status										0.005	0.012	1.005
γ_{119}	Early onset*Urbinazation										-0.110	0.088	0.896
β_{120}	Memory	-0.115	*** 0.005		-0.107	*** 0.007		-0.115 ***	0.007		-0.114 ***	0.007	

Table 3 (Continued)

		Model I			Model II			Model III			Model IV		
		B		S.E. exp (b)	b		S.E. exp(b)	B		S.E.	exp (b)		S.E. exp (b)
Random effects													
Level 2 (between individuals)													
μ_{0j}	Intercept variance	2.315	***	0.136	2.302	***	0.134	1.391	***	0.102	1.367	***	0.101
μ_{1j}	Slope variance Age I	0.046	***	0.004	0.039	***	0.004	0.010	***	0.002	0.009	***	0.002
μ_{2j}	Slope variance Age II	0.012	***	0.001	0.012	***	0.001	0.010	***	0.001	0.009	***	0.001
Covariance													
Level 2 estimated covariance matrix													
τ_{01}	Intercept*Slope variance Age I	0.222	***	0.020	0.194	***	0.019	0.086	***	0.012	0.084	***	0.012
τ_{02}	Intercept*Slope variance Age II	-0.079	***	0.011	-0.084	***	0.011	-0.071	***	0.010	-0.068	***	0.009
τ_{12}	Age I*Age II	0		0	0		0	0		0	0		0
ε_{ij}		0.000		0.000	0.000		0.000	0.000		0.000	0.104		0.071

Source: Crime Survey data
*p<0.10;**p<0.05;***p<0.01
N_{ind} = 2.244 ; N_{years} = 47.446

Figures 1 and 2 present graphs of the conviction and self-reported age-crime curves based on the parameter estimates of model I presented in Table 2 and 3. As can be seen, both convictions and self-reported offences rise to a peak during the late teens/early twenties and they gradually decline from that point on. The strong relation between age and crime on the individual level thus mirrors the familiar age crime curve based on aggregate data.

For comparison, Figures 1 and 2 also present the estimated curves based on the quadratic model as used by Laub and Sampson (2003). As with the Glueck data, this model does not seem to fit our data very well – especially for the CCLS-data. Besides yielding easy to interpret parameter estimates, the piecewise model used here more closely resembles the shape of the observed variation in crime over the life span.

Figure 1 Observed and Predicted Number of Convictions: Ages 12 to 72 (Model I, CCLS Data)

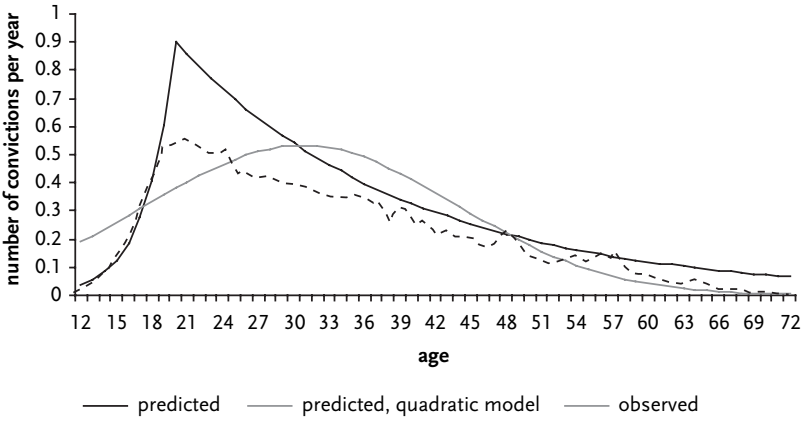
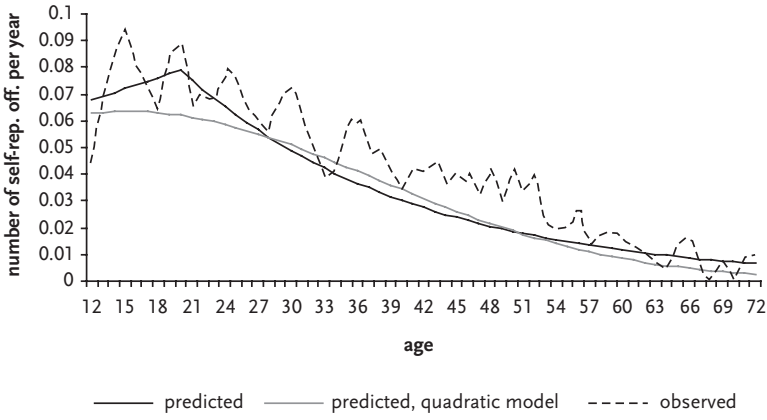


Figure 2 Observed and Predicted Number of Self-Reported Offences: Ages 12 to 72 (Model I, NSCR-Survey Data)



Effects of Life Circumstances

Static theories assume the link between life circumstances and crime to be spurious: life circumstances are not expected to influence crime when propensity differences between individuals are taken in to account. Dynamic theories on the other hand do expect life circumstances to have an effect on crime, even when between-individual differences are controlled for. To test these hypotheses time varying covariates of life circumstances were entered in model II. In the analysis, being unmarried without children was used as the contrast state, that is: all effects are relative to the rate of offending whilst being unmarried and childless. Indicators for the adult-means were also included. Table 2 and 3 provide the estimates for the effects of stable between-individual and time-varying within-individual life circumstances.

For the CCLS the coefficient of being married without children is –0,678, generating an estimate of a 49% (=exp(-0.678)) reduction in convictions in comparison with being in an unmarried state. Being married and having children reduces convictions by 41%. Thus, the same individual while married is less likely to be convicted than when he is not married. Being separated without having children also leads to a decrease in convictions by 40%. The between-individual estimates are also significant; individuals with a high propensity to be married show less convictions than those less likely to be married at any point in their lives. This tells us that those most likely to be married have the least chance of getting convicted, but that regardless of that likelihood, any person while married has less chance of getting convicted than while he is not. Analogously, individuals with a high propensity to be separated without children are more likely to be convicted than individuals less likely to be separated without children, but while in a state of separation any person has less chance of getting convicted than while not separated. Whereas being separated whilst having under-aged children does not contribute to within individual differences in conviction rate, those with a high propensity to be separated whilst having under aged children are more likely to be convicted than those less likely to be separated whilst having under aged children. Based on these results, the static hypothesis regarding the effects of life circumstances must therefore be rejected in favor of dynamic ones.

The self-report data however tell a different tale. While between-individual differences in marriage and work have an effect, within-individual differences barely do so. Only being married with children and being in a state of separation without children seem to lead to a reduction in the number of self reported offences. The statistical power of the self-report study however is considerably less than that of the larger CCLS-sample and might have contributed to these findings.

The effects of life circumstances on crime are visualized in Figure 3 and 4. These graphs are based on the parameter estimates of model II presented in Table 2 and 3 respectively, and depict the constructed life courses of two counterfactual individuals, with one of them experiencing a number of transitions in life circumstances (the solid line in the graph). This individual marries at age 25 and becomes a parent at age 30; from age 56 to age 72 he has no under aged children, but he remains married. The dashed lines represent the criminal trajectory of an individual that does not experience any of these transitions. While not significant, the direction of the effects of life circumstances in the self-report data as shown in Figure 4 is as expected and similar to that in the official data. These figures clearly show the substantial consequences of transitions in life circumstances, as predicted by dynamic theories (Laub & Sampson, 2003; Sampson & Laub, 1993).

Figure 3 Predicted Number of Convictions by Age and Transitions in Life Circumstances: Ages 12 to 72 (Model II, CCLS Data)

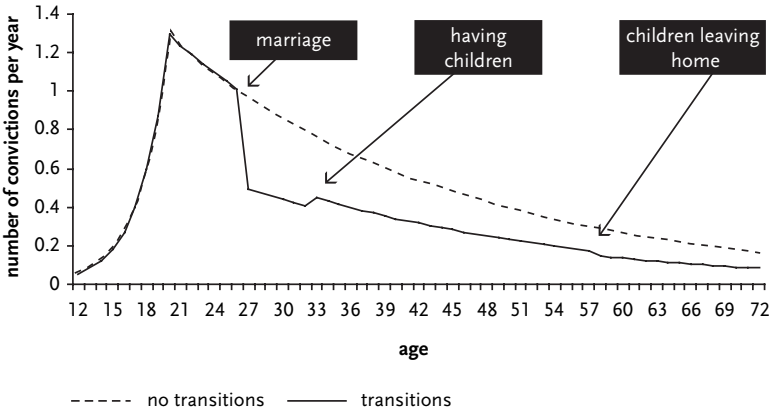
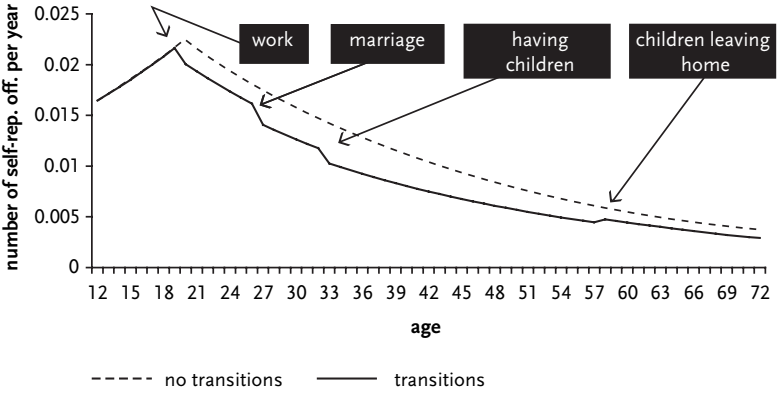


Figure 4 Predicted Number of Self-reported Offences by Age and Transitions in Life Circumstances: Ages 12 to 72 (Model II, NSCR-Survey Data)



Effects of Offender Type

To test the typological hypothesis that different offender types follow different criminal trajectories, variables indicating offender type based on enduring individual differences were added in the between-individual equations in model III. Here we use sex and indicators of early problem behavior to distinguish between groups. Static theories predict significant direct effects of offender types since they are defined as combinations of stable individual traits that might – in part – represent stable differences in criminal propensity. Typological theories would also expect the effects of age to differ between groups. Table 2 and 3 provide the estimates of the effects of offender type and their interactions with age. Figure 5 and 6 present graphs depicting the average criminal trajectory per offender type based on parameter estimates of model III for the CCLS and crime survey-sample respec-

tively.[18] These figures show that offender groups differ in the average rate of offending and in the way that rate develops over the life span.

In the CCLS-sample the average annualized rate of offending is 84% (=exp(0.607)) higher for early onset men than for late onset men (table 2). The mean number of convictions for both types of female offenders is less then that of late onset men; 68% and 78% less respectively. Early onset men show the steepest rise to the peak age of offending (0.575). The rise in offending for late onset women on the other hand is less steep than that of late onset men (-0.206). Early onsetters also show a less steep desistance slope than late onsetters. The annual decline in the number of convictions for late onset men is 5% (=exp(-0.051)). The rate of desistance for early onset men is 3% (=exp(-0.051+0.019)), the desistance rate of early onset females is 1%. Offenders who were first convicted before age 16 thus not only tend to get convicted at a higher rate than those first convicted after age 16, they also tend to be more persistent in their offending behavior. Over the entire 60-year period early onset males are estimated to be convicted for on average 58 offences. Late onset males are estimated to be convicted for an average of 24 offences. The estimated average number of convictions for early onset females is 14 and that for late onset females 7. On average then, between age 12 and 72 early onsetters are convicted more than twice as often as late onsetters.

Analyses of the self-report data give similar results (see table 3, model IV). Males reporting to have experienced childhood behavioral problems have an annual offending rate that is over twice as high (exp(0.942)=2.565) as men who did not report an early onset of problematic behavior. Early onset women do not differ significantly from late onset men; whereas late onset women do tend to offend less. No significant differences were found in the desistance slope in the self-report data. While the average number of offences is much lower in the self-report sample, the estimated average number of offences for those reporting an early onset of problem behavior is 1.8 times higher for males and 1.6 times for females.

Given the significance of the interactions between the effects of age on crime and offender type, our hypothesis based on static theories must be rejected. However a note of caution is warranted here: although predicted by the leading typological theories, none of the offender types discerned here – except for that of early onset women which is based on a small number of individuals – shows a flat desistance slope. Interpreted in this strict sense, life-course-persistent offenders do not seem to exist; all groups show declining patterns of offending with age. Desistance of crime thus seems to be the default, even for those starting their criminal trajectory early. These findings are in line with those of Sampson and Laub (2003b) on the Glueck-men.

18. The graphs give the predicted number of offences for the reference categories: unmarried, no children, not schoolgoing, unemployed, individuals living in a rural area.

Figure 5 Predicted Number of Convictions by Age and Offender Type: Ages 12 to 72 (Model III, CCLS Data)

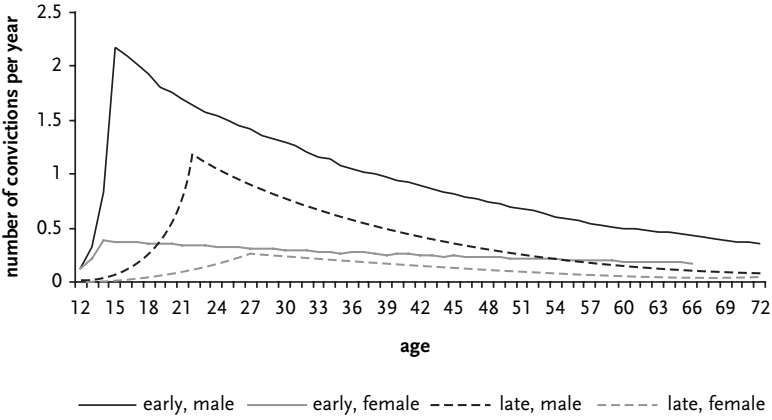
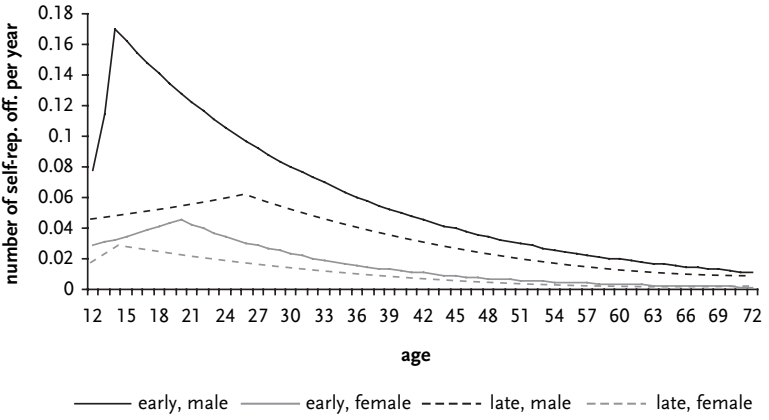


Figure 6 Predicted Number of Self-Reported Offences by Age and Offender Type: Ages 12 to 72 (Model II, NSCR-Survey Data)



Effect of Life Circumstances Differ by Offender Type

Unlike dynamic theories, typological theories expect the effects of life circumstances to differ between offender groups, with persistent offenders being less sensitive to change. To test this final hypothesis we estimated a fourth model that allowed the effects of life circumstances to interact with a variable denoting early versus late onset.

The significance of the interaction effects in Model 4 in table 2 indicates that the effects of time-varying life circumstances differ between early and late onsetters. While being married without children reduces convictions by 45% (=exp(-0.600)) for late onsetters (see β_{40}), those who were convicted before age 16 only experience a 20% (=exp(-0.600+0.382)) reduction in convictions while married without children compared to when they are single. The effect of being married without children on the criminal behav-

ior for early onsetters is thus less than half that of the effect marriage has on the criminal behavior of late onsetters. Being married with children reduces convictions with 39% for late onsetters compared to 12% for early onsetters. While having under aged children does not significantly affect the conviction rate of late onsetters, early onsetters experience a 32% increase in convictions while having children without being married. However, no significant interactions were found in the self-report sample.

While previous analysis yielded little evidence for the existence of a truly life course persistent group, significant interaction effects were found in the CCLS-sample. Not only do early onsetters offend at a higher rate, the reduction in their criminal behavior associated with being in a state of marriage is less than that for late onsetters. This finding corroborates the typological idea of early onsetters not only being high on criminal propensity, but also of them becoming more and more ensnared by the consequences of their antisocial behavior. Having a child out of wedlock seems to be a catalyst for offending especially for those who already were convicted before age 16. In sum, our results from the conviction data suggest that the effects of life circumstances on crime are indeed different for different types of offenders. However, this finding is not replicated for the self-report data. None of the interaction effects are statistically significant (see γ_{39} to γ_{79} in model IV in table 3).

Explaining the Aggregated Age Crime Curve

Finally, we examine the extent to which variation in crime by age at the aggregate level is due to age-graded differences in life circumstances and the distribution of offender types in the population. Figures 7 and 8 present graphs of the conviction and self-reported crime trends for three scenarios based on the parameter estimates of model III presented in Table 2 and 3 respectively. The upper dashed line represents the estimated average age-crime curve for a hypothetical population (similar in personal characteristics and age-composition to both samples) of unemployed (only self report sample), non-married and childless individuals. The lower dashed line represents the estimated average age-crime curve for a hypothetical population, in which everyone is employed and married at every age. The solid line represents the estimated average age-crime curve for the Dutch convict-population and the general Dutch population respectively. This latter aggregated age-crime curve is composed of the individual-level age-crime curves of all individuals in both samples. A number of these individuals have undergone changes in their life circumstances during the course of their lives that influenced the way their criminal behavior developed over time. The extent to which the average age-crime curve of the sample diverts from that of the population of unemployed, unmarried and childless individuals thus depends both on the effects life circumstances have on crime (see figure 3), as well as on the number of Individuals in certain life circumstances at a given age.

As can be seen in Figure 8, very few people have undergone crime-inhibiting changes in their life circumstances prior to age 20; the sample average largely coincides with the non-transition population average. In the period between age 20 and 30 the estimated sample average increasingly approximates that of a population in which everybody works and is married. A growing number of respondents have apparently undergone these changes in their life circumstances causing their average rate of offending to drop.

Figure 7 shows the average of the conviction sample to stay closer – in comparison to Figure 8 – to the non-transition population average. Upon closer inspection it turns out

that this is not because individuals in the conviction sample do not marry but rather because they are married for shorter periods of time than individuals in the self-report sample. On average individuals in the conviction sample are single for a longer period of time. They also spend more years in a state of being separated (see Table 1). At the aggregate level this causes the inhibiting effect of being married to be nullified by the crime-increasing effect of being in a post-marital state (either with or without children). The difference between the solid sample estimate and the lower dashed line thus indicates the extent to which age graded differences in life circumstances can explain age bound differences in crime rates. The curvature of the lower dashed line itself is indicative of the effect age has on crime other than that through life circumstances.

Figure 7 Predicted Aggregated Age-Crime Curve (Registered Crime) by Age-Bound differences in Life Circumstances: Ages 12 to 72 (Model III, CCLS Data)

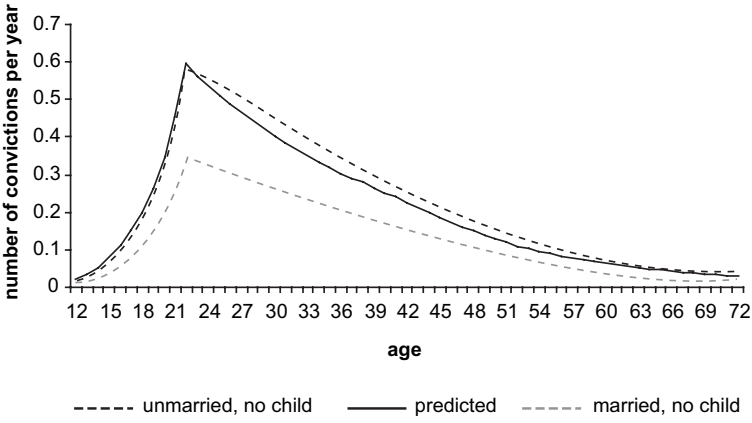
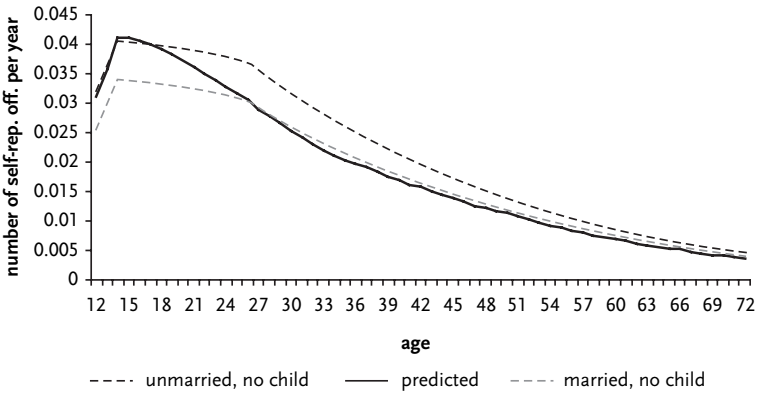


Figure 8 Predicted Aggregated Age-Crime Curve (Self-Reported Crime) by Age-Bound differences in Life Circumstances: Ages 12 to 72 (Model III, NSCR-Survey Data)



8 Discussion

Within the field of developmental and life course criminology, three different approaches to longitudinal patterns of crime have emerged, ascribing these patterns either to stable differences in criminal propensity, life course contingencies, or a combination of the two. In this paper we sought to provide further evidence on the question what level of theoretical complexity is needed to explain development in crime over the life span. Although our data have their limitations, they help to improve the current research literature in a number of ways. First, our data reflect patterns of crime from age 12 to 72 allowing us to describe and test hypothesis on the development of criminal behavior in middle and late adulthood, periods on which most existing research has no data. Second, prior research could not control for 'false desistance' resulting either from incarceration or death, and third, most previous studies did not make use of large representative samples.

Three key findings emerge from our analyses. First, like other studies, we find a strong relationship between age and crime at the individual level that varies across individuals. Individuals differ in both the rate and shape of their criminal trajectories. Second, even after between-individual differences in criminal propensity are accounted for, life circumstances still affect offending. Our results thus provide strong support for the notion that the association between life circumstances and crime results not solely from social selection, but also from social causation. However, it must be noted that we cannot entirely rule out the possibility that our results are due to some unmeasured time-varying variable that influences both life circumstances and crime.

The effects of life circumstances are more marked in the CCLS-sample. In fact, most studies that did find effects of life circumstances used official data. It might be that serious offences recorded in official data or the judicial intervention following them are more hazardous to a marriage than the less serious, and often unsanctioned offences reported in survey research.

Our findings also provide support for the life course concept of social timing. Having a child out of wedlock proved to increase the likelihood of offending in the official data, even after personal differences in criminal propensity were taken into account. The negative effects of such an 'out of order' life course transition depend on the reaction of the individual and his or hers social surroundings to the new circumstance (Elder, 1998). Life course persistent offenders are thought to be lacking in conventional social skills (Moffitt, 1997), while their long history of troublesome behavior is likely to have exhausted their sources of social support. This may explain our finding that the negative effect of having children out of wedlock is greatest for those who experienced an early onset of offending.

Finally, variation in both the rate and shape of criminal development are partly explained by differences in stable personal characteristics. Different types of offenders show different rates of change. Typological theories predict life course persistent individuals to continue their antisocial lifestyle well beyond midlife, their criminal behavior not being strongly influenced by age. Our results however indicate that offending declines with age for all individuals, including those who started their criminal career early. Although we cannot exclude the possibility that early onset offenders continued to be involved in forms of deviant behavior that are less likely to attract judicial attention, the wide variety of offences that are captured in our study and the fact that both official data and self-reports show similar patterns, make this argument not seem convincing.

Based on these results we conclude that static theories offer a too simplified view on development of crime over time. The direct effects life circumstances have on offending warrant a dynamic approach. Less clear-cut is to what extent our findings also offer justification for a typological approach to the development of crime over the life span. Results from our analyses show that offender type is linked to the rate of desistance and even suggest some offender types to be less influenced by changes in life circumstances than others, thus formally warranting the high level of complexity characteristic of typological theories. However, our findings also add to the growing body of evidence that the concept of life course persistent offenders needs to be revised (Piquero et al., 2002; Sampson & Laub, 2003).

Finally, although our results have shown their static position to be untenable, we do concur with Hirschi and Gottfredson in that much of the effect age has on crime remains unexplained (Hirschi & Gottfredson, 1995). To achieve a better understanding of the development of crime over the life course we therefore – in addition to paying attention to life events – plead for decomposing the effects of age on crime into its physiological, psychological and social components.

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Chapter 5

Continuity in crime: Testing 'kinds of people' versus 'kinds of contexts' explanations for the relationship of past to future offending

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Abstract

This study focuses on the relationship between past and future offending. It examines the extent to which the positive association between past and future offending can be explained by either stable individual differences in criminal propensity – (un)observed heterogeneity –, or by the altering effect prior offending has on the individual or his life circumstances making crime more likely – state dependence. To test our hypotheses, we use data on individual criminal careers over a period of 60 years. Self-report data were derived from a nationally representative survey administered in the Netherlands in 1996 to 2,900 individuals aged 15 years or older. Official data were retrieved for a 4% (N = 4,684) sample of all individuals whose criminal case was irrevocably disposed of in the Netherlands in 1977. Using hierarchical linear modeling we find both heterogeneity and state dependence partially explaining continuity in crime in both samples. In addition, we find that the impact of prior offending decreases over time and that that impact depends on the total number of previously committed offences.

1 Introduction

The large number of longitudinal studies that resulted from the growing interest in developmental approaches to crime over the past two decades has lead to an accumulation of important empirical findings on age, crime and criminal careers. One consistent finding is the positive association between past and future offending: people who committed crimes in the past are more likely to commit crimes in the future than people without a criminal history (Block & Van der Werff, 1991; Farrington, 1992; Gendrau, Little, & Goggin, 1996; Tracy & Kempf-Leonard, 1996). While this association is generally accepted, the mechanisms generating this association are far less agreed upon.

Following Heckman (1981), criminologists have argued that the positive association between past and future offending could reflect one of two processes, or a mixture of both (Nagin & Paternoster, 1991). One is that individuals differ in some stable unmeasured propensity to commit crimes, causing people likely to commit a crime at one moment to be as likely to commit a crime the next moment. In this view the observed stability in criminal behavior thus results from 'population heterogeneity'. A second explanation is that the act of committing a crime alters the offender or the offender's life circumstances in such a way that future offending becomes more likely. Such a contagious effect of prior offending is termed 'state dependence'. Criminological theories aimed to explain the development of crime over time can be broadly grouped by their emphasis on either one of these processes (Nagin & Paternoster, 1991).

The notion of population heterogeneity is central to what Paternoster et al. (1997) labeled static theories. Static theories contribute between-individual variation in crime to stable differences in people's latent tendency to offend. These differences are established early in life and set people of on a criminal trajectory that is relatively unaffected by events that take place later in life. Hirschi and Gottfredson's self-control theory is a prominent example of such a static theory (Gottfredson & Hirschi, 1990; Hirschi & Gottfredson, 1995). This theory states that due to a combination of disposition and upbringing, people differ in their level of self-control. Once formed, self-control is a relatively stable characteristic that is negatively associated with criminal behavior. Personal experiences and life events thus do not influence the level of self-control and hence do not influence the risk of offending. According to static theories, the positive association between past and future offending is therefore due to the fact that people likely to offend at one time, as a result of their stable criminal tendency, are also likely to offend at some other time. The correlation between past and future offending is thus spurious and results from between individual differences. Static theories thus can be said to offer a 'kinds of people' explanation for continuity in crime (Sampson en Laub, 2003: 24).[1]

Dynamic theories, on the other hand, maintain that there is a genuine causal link between past and future offending behavior. Dynamic theories postulate that the development of criminal behavior remains context sensitive and open to change throughout life. A prominent example of such a dynamic approach is Sampson and Laub's age graded

1. Static theories do not preclude changes in crime over time, like a decline in crime with age. What they do deny is a causal relationship between (important changes in) life circumstances and (changes in the rate of) offending (Gottfredson en Hirschi, 1995: 135–136).

theory of informal social control (Laub & Sampson, 2003; Sampson & Laub, 1993).[2] In brief, this theory states that attachments to age relevant sources of social control, such as school, work and family, inhibit the development of criminal behavior. Changes in life circumstances may lead to changes in criminal behavior. Dynamic theories as such stress the importance of the kind of context a person is in, in explaining his or her likelihood to offend. In as much as prior offending influences current life circumstances or otherwise alters the inhibitions or motivations to commit crime, dynamic theories also offer an explanation for continuity in offending behavior. Sampson and Laub (1995) speak of cumulative disadvantage: offending weakens the bonds with conventional society, and, in turn, these weakened bonds increase the likelihood of subsequent offending, which leads the offender to become even more estranged. This downward spiral caused by state dependence is claimed to account for the observed continuity in crime.

These theoretical perspectives offer contrary views of the causal effects of prior offending behavior and life circumstances on future offending behavior. In this chapter we test these theories by using both self-report and official data to investigate whether continuity in offending can be attributed to stable individual differences in criminal propensity or, alternatively, whether continuity in offending is caused by the contagious effects prior offending has on the probability of future offending.

2 Earlier research

The existing empirical evidence indicates that both unobserved heterogeneity and state dependence contribute to continuity in crime (Nagin & Paternoster, 2000; Piquero, Farrington, & Blumstein, 2003). However, in estimating the relative contribution of both explanations it seems to make a difference whether one uses official data or self-report data on offending.

Using self-report data from a three-wave panel survey, Nagin and Paternoster (1991) found that the positive association between past and future offending is principally due to state dependence. Prior involvement in property crime increases the risk of subsequent property offending more than threefold. In a later study using self-report data from the National Youth Survey, Paternoster and Brame (1997) also find that prior offending has a substantive effect on future offending – with the magnitude of the state dependence effect strikingly similar to that found by Nagin and Paternoster (1991).

Studies based on official records, on the other hand, usually find stronger support for the heterogeneity explanation. Using data from the Cambridge Study in Delinquent Development, Nagin and Farrington (1992a, 1992b) find considerably stronger evidence for unobserved heterogeneity than state dependence (see also: Paternoster, Brame, & Farrington, 2001). A six-year follow-up study of releasees from North Carolina training schools also showed that the effect of prior arrests on future arrests declines strongly once unobserved heterogeneity is controlled for (Paternoster et al., 1997). However, while less pronounced, both studies still found significant heterogeneity effects. Two studies on

2. Sampson and Laub do acknowledge that some people are more crime prone than others, but find these differences to "do not do a good job of distinguishing different offending trajectories in the long haul" (Laub and Sampson, 2003: 107).

official data however did find evidence for state dependence. Bushway, Brame and Paternoster (1999) found strong positive effects of prior offending even after controlling for observed and unobserved heterogeneity. Using arrest data from the 1958 Philadelphia birth cohort they conclude that some kind of state dependence process is at work in this dataset. Most recently, Ezell and Cohen (Ezell & Cohen, 2005) using three parole release samples, found that having been arrested at a prior age increased the rate of criminal activity at the next age even after rigorously controlling for population heterogeneity in a number of ways. Controlling for criminal propensity did reduce the magnitude of the state dependence effect, but the association between past and subsequent offending did remain both positive and significant.

Summing up, research so far found mixed support for both the 'kinds of people' explanation of continuity in offending and the 'kinds of context' explanation. Studies using student samples and self-report data found stronger state dependence effects, while studies using high-risk samples and official records are more mixed, finding stronger evidence for population heterogeneity. Prior work however varies in statistical power due to differences in panel length and sample size, which could have contributed to these mixed findings. The ideal panel would track a cohort from (pre)teen years to adulthood, the number of period of measurements far exceeding the two-period minimum (Nagin & Paternoster, 1991). Starting the panel at a young age would minimize what is called the initial conditions problem: the fact that a substantial portion of the sampled population has already been delinquently involved prior to the initial measurement.

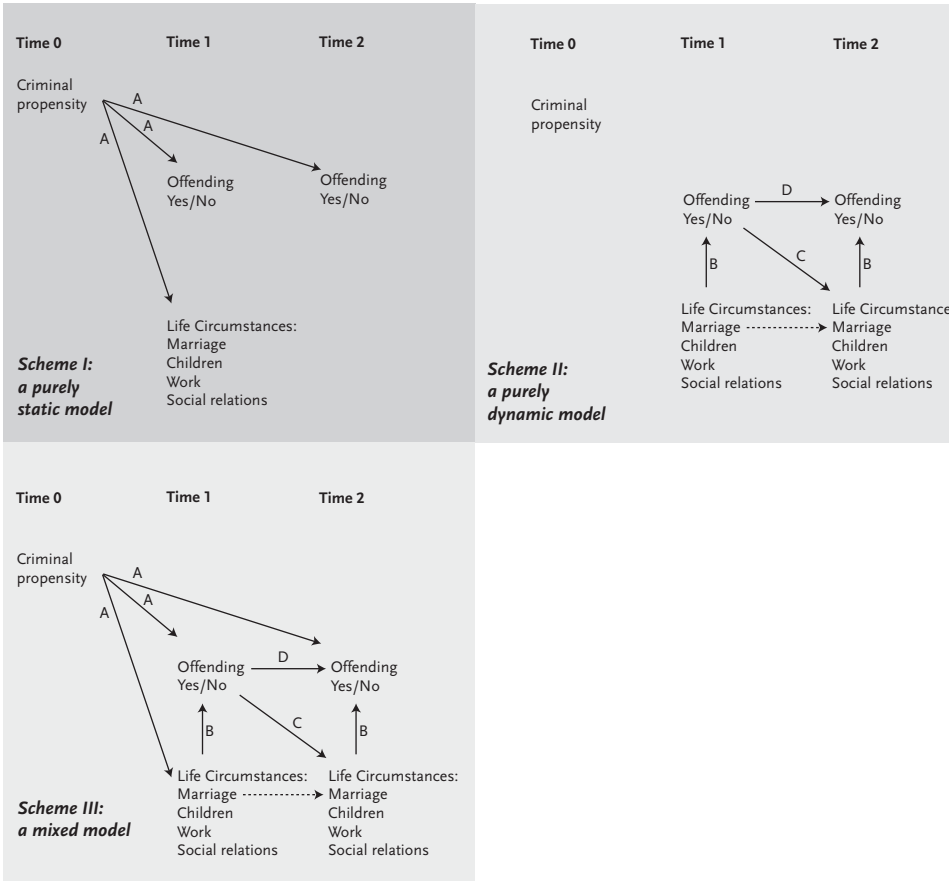
3 Hypotheses

The static and dynamic processes proposed to underlie the observed association between past and future offending are graphically represented in Figure 1 (see also: Bushway, Brame & Paternoster, 1999). These schematic representations will serve as a framework for formulating hypotheses. In Figure 1, diagram I represents a purely static theory and diagram II a purely dynamic theory. The third diagram integrates the two previous models into a mixed model.

Static theories offer a 'kinds of people' explanation for the association between past and future offending.[3] The correlation between offending at time 1 and offending at time 2 is postulated to result from a stable latent tendency – criminal propensity – influencing offending equally at both points in time (represented by the A-labeled arrows in scheme I and III). Observed continuity in crime results from population heterogeneity in this tendency. Criminal propensity not only influences offending but also, via social selection, a

3. As previously noted by Nagin and Farrington (1992) the unobserved time-enduring characteristics of the individual constituting his criminal propensity are not necessarily limited to personality traits. In theory, enduring characteristics of the individual's environment or social position could be part of his criminal propensity as long as such characteristics are not affected by the individual's involvement in crime. While we cannot rule out continuities in the interpersonal environment in contributing to behavioural stability, our data do show that individuals in both our samples experienced considerable changes in residential, educational, employment, marital and fertility status, rendering it unlikely that possible persistent heterogeneity in our samples is for a substantial part due to a high level of stability in the social environment.

Figure 1 Schematic representation of a static, dynamic, and mixed model of continuity in crime



person's life circumstances. Both the association between past and future offending and that between life circumstances and crime are thus believed to be spurious. Based on the kinds of people explanation that static theories offer, it must be hypothesized that *past offending has no effect on future offending once (un)observed individual differences are taken into account*. In a similar vein it can be hypothesized that *life circumstances have no effect on offending once (un)observed individual differences are controlled for.*

Dynamic theories, on the other hand, state that offending depends on 'kinds of contexts' and state that life circumstances have a direct causal effect on crime (represented by the B-labeled arrows in scheme II and III). Dynamic theories also predict a state dependence effect of past on future offending. This could either be a direct effect – the D-labeled arrow, or an indirect effect: prior offending affecting future life circumstances which in turn affect future offending – path C-B (cumulative disadvantage), or a combination of both. The extent to which the effect of prior offending is a direct or indirect effect will not be investigated in this chapter. A crucial difference between dynamic and static

theories however, is that the dynamic theories predict effects both of life circumstances and prior offending on offending, while static theories do not. Based on the 'kinds of contexts' argument offered by dynamic theories we therefore hypothesize that *prior offending increases the likelihood of future offending even when (un)observed individual differences are taken into account.* Furthermore, we also hypothesize that *life circumstances have an effect on offending even when (un)observed individual differences are controlled for.*[4]

If the association between past and future offending is – at least partly – explained by state dependence, these effects can be expected to diminish over time (Nagin & Paternoster, 1991). The mere passing of time may reduce the negative thrust of the spiral of cumulative disadvantage: the more time has passed since the offence was committed, the less it will act as a snare precluding conventional opportunities. With time, bosses and wives are more likely to view past criminal behavior as something gotten over. Therefore the fifth hypothesis tested here is that *the more time has elapsed since the previous offence, the smaller the effect of that earlier offence on the likelihood of future offending.*

Finally, the state dependent effect of prior offending can be argued to be subject to the law of diminishing returns. While committing an offence for the first time may substantially alter the offender or his life circumstances, the detrimental effects of second, third and subsequent offences will be increasingly less strong. Put differently: if, for example, committing an offence makes the individual consider himself an offender, than, given that individuals are likely to behave according to their self-image, committing an offence for the first time will drastically affect future offending, since committing an offence for the first time can be expected to drastically alter the individual's self image – from non-offender to offender. After committing several offences the altering effect of every subsequent offence on the offenders self-image will be less since he or she already thought of him- or herself as an offender. Using the terminology of organizational change research (Weick & Quinn, 1999), we label the idea that future offending behavior isinfluenced not only by offending behavior directly preceding it, but also by overall levels of prior criminal involvement: 'continuous change'. The concept of continuous change captures the enduring effect the total extent of an individuals criminal history has on his future chances of offending.

Continuous change is distinct from the earlier discussed (short term) effect of prior offending. State dependence is expected to influence criminal behavior above and beyond continuous change: state dependence referring to the short-term effect of the most recent offence committed irrespective of the total number of crimes preceding that offence. Analogous to the use of the term in organizational research this short-term state dependence effect can also be referred to as 'episodic change'.[5]

Continuous change is inconsistent with purely static theories of crime since it allows for the individual's propensity to be influenced by contextual factors over time, be it in a more distal timeframe. While the notion of continuous change concords with the basic

4. As diagram III in figure 1 shows, population heterogeneity and state dependence interpretations of the link between past and future offending are not mutually exclusive; propensity, life circumstances, and prior offending could all simultaneously contribute to the development of crime over time. An initially sharp distinction between 'kinds of people' explanations and 'kinds of context' explanations however, we feel, facilitates more fully understanding the theoretical, methodological and practical consequences of each separate perspective.

assumption of dynamic theories, these theories have tended to stress the fact that prior offending cuts off conventional opportunities, instead of prior offending influencing the potential effect of those opportunities (Sampson & Laub, 2003: 299). Like static theories, dynamic theories thus have tended to treat criminal propensity as a constant, ascribing changes in crime to changes in exogenous circumstances, not to changes in criminal propensity over time.

Two additional hypotheses can be formulated regarding the concept of continuous change and offending. Continuous change implies that criminal propensity itself is viewed as a 'dynamic' trait, this propensity being subject to long term change as the result of an individual's past offending behavior. A first hypothesis therefore, as has been found in studies on recidivism (Gendrau et al., 1996), is that *the total number of prior offences is positively associated with the likelihood of future offending*. Second, based on the assumption of a process of diminishing returns, we hypothesize that *the episodic state dependence effect of prior offending on future offending decreases the more previous offences one has committed*. Chronicity is thus expected to render offenders less sensitive to episodic influences (see also: Moffitt, 1997).

4 Data and methods

4.1 Study 1: Self-report data

In this article we use two datasets that can be seen as complementary. The first set is derived from a Dutch national crime survey, administered in 1996 by the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR). In total 2,951 people aged 15 and up were questioned, with oversampling of those between 15 and 30 (N=1,012).[6] During one-hour long computer assisted face-to-face interviews (CAPI) respondents were asked to fill out a life history calendar of major life events. This calendar was then used as a reference to facilitate recall in questions regarding life circumstances (education, employment, marital, fertility and residential history) and offending. For reasons of comparability in this study offending for the self-report data was defined as offending after age 12. For our purpose we will examine two offence types: violent crimes (threatening, assaulting or injuring) and property crimes (shoplifting, bicycle theft, theft from homes or cars, or theft of money). For a detailed discussion of the sampling design and the data collection procedure see Wittebrood and Ter Voert (1997).

This dataset is particularly suited for our purpose because it yields retrospective information on life circumstances and offending over the entire life span for a nationally representative sample. It is well known however, that retrospective data may be inaccurate or biased if respondents are asked to provide information about a period long ago (Chaiken & Chaiken, 1982; Horney & Marshall, 1991; Visher, 1986). To cope with this problem,

5. Our notion of continuous change is comparable to what Nagin and Paternoster (1991) refer to as 'inertia': the idea that criminal involvement is determined not only by an individual's current social circumstances and state of mind but also by prior levels of those influences. Here we use continuous change to stress that the essential difference betweencontinuous change and state dependence or episodic change is the time scale in which state dependence effects are measured.
6. A weight factor was used in all analyses to account for this oversampling.

several strategies had been employed in the study's design. First, recognizing potential problems with self-administered questionnaires (Horney & Marshall, 1991), the respondents were interviewed face-to-face enabling the interviewer to spot and correct possible mistakes made by respondents. Second, using the life history calendar, information most easy to remember (marriage, fertility, residential history) was asked first, working towards the more difficult information (educational and employment histories) and ending up with the information most difficult to remember (offending histories)(Dex, 1991). Third, in addition to these design features, we choose to restrict our analyses to the period 1971–1995, thereby limiting the retrospective period to a maximum of 25 years. For example, a 20 year old in 1996 will thus be included from age 12 to age 20, while a 60 year old in 1996 will be included only from age 35 to age 60 since the period between age 12 and 34 for this person falls before 1971. Finally, to control for possible memory problems, all our models pertaining to the self-report data include a variable representing the number of years elapsed since the years in which the events took place.

4.2 Study 2: Official data

The second dataset used here contained the entire criminal histories of a nationally representative sample of 5,164 individuals whose criminal case was tried in the Netherlands in 1977.[7][8] This sample constitutes the basis for the Criminal Career and Life Course Study (CCLS) that is carried out by the Netherlands Institute of Crime and Law Enforcement (NSCR). A detailed description of the sample and the sampling procedure is given by Nieuwbeerta & Blokland (2003). In 1977, 18% of the entire sample was convicted for a property offence, 7% for a violent offence, and the remaining 75% was convicted for another type of offence – like drug- or traffic offences –, was acquitted, or had their case waivered by the public prosecutor for technical or policy reasons. Abstracts from the General Documentation Files of the Criminal Record Office ('rap sheets') were used to reconstruct the entire criminal careers of the CCLS-sample. The General Documentation Files contain information on every criminal case that has been registered at the Public Prosecutor's Office. For reasons of comparison with the self-report study, in this chapter we only use those cases that pertain to violent or property offences and that amounted to a conviction or a waiver for policy reasons.[9] Added to these criminal histories were population registration data (GBA) that are collected by all municipalities in the Netherlands since 1938. These data specify if and when these individuals were married, separated, had had children, or had died during the period under investigation. All these official records have the advantage that they do not rely on memory and therefore provide reliable information on criminal involvement and life circumstances. Based on the personal details from 1977, 90.7% of the sample could be traced in the population registration data. Indi-

7. Cases either ruled upon by a judge or decided upon by the Public Prosecutor. In the Netherlands the Public Prosecutor has the discretionary power to drop a case (waiver) or settle the case by means of transaction if he or she feels further prosecution is unwarranted.
8. The original sample is stratified to reduce the number of traffic offences and increase the number of less common, mostly serious offences. A weight factor was used in all analyses to account for this stratification.
9. Violent offenses include: rape, assault, threatening, manslaughter, murder, battery, robbery and extortion. Property offenses include: forgery, theft, aggravated theft, embezzlement, fraud and fencing.

viduals who could not be traced were excluded from the sample, leaving a total of 4,684 individuals for this study.

The two samples used here thus differ in terms of (a) representativity and (b) the dependent variable. While the self-report sample is representative for the Dutch population in 1995, the CCLS-sample is representative for all prosecuted offenders in 1977. Furthermore, official records only pertain to the part of an individuals offending behavior that has become known to the police and the Prosecutor's Office.

4.3 Analysis methods

To investigate the relationship between prior and future offending we organize our data and analyses in the following way. First, we constructed a so-called person-period file in which every record contains information on the number of self-reported crimes or convictions for each individual in each year, as well as information on all relevant covariates. The file for the self-report data contains information on 61,473 person-years for 2,950 individuals. The file constructed out of the CCLS-sample contains 192,670 person-years for 4,684 individuals.

Second, to test the hypothesis that prior offending increases the likelihood of subsequent offending, we constructed a variable indicating whether or not a person had previously committed a violent or property offence. This variable was coded 1 for the ten years following a violent or property offence, and 0 for every year in which that person had not yet previously committed an offence, or in years in which the previous offence was committed more than ten years ago. To test whether the effects of prior offending decrease with time, a variable denoting the natural logarithm of the number of years – with a maximum of ten – elapsed since the committing of the last offence was also included in the person-year files. We use the logarithm to model a more pronounced decline in the first few years after the prior offence than in later years.

Thirdly, to test for the effects of continuous change, we constructed a variable denoting the natural logarithm of the total number – with a maximum of 25 – of times (here: years) prior to the current offence in which a person was convicted for a similar type of offence. Again we use the logarithm to model the expected decreasing impact of every subsequent year of offending.

Fourth, to analyze the effects of personal characteristics and life circumstances on offending we included variables for sex, age, marital and fertility status in the person-year files. The variable sex was coded 0 for men and 1 for women. Five dummy variables were included to account for a possible non-linear age/crime relationship dividing age into five age groups: 10–14, 15–19, 20–24, 25–34, 35–44, and 45 and up (the reference category).[10] Based on the combination of marital (unmarried, married, separated) and fertility status (no under-aged children, under-aged children) we constructed six variables coded 0 for individuals not in that particular state and 1 for individuals that were. The survey data also contained information on whether individuals were school going, or employed or in military service (all coded 1) or not. Those employed or in military service were assigned to an occupational status measure using a recoding scheme provided by Ganzeboom and

10. This division of age was chosen after trying various alternatives because it captures the skewed nature of the age/crime relationship and at the same time is economical in the use of dummy variables.

Treiman (1996). Finally, for individuals in the survey-sample, an index of the urbanization of the respondent's place of residence was constructed ranging from 0 to 4.

As has become common practice in developmental criminological literature we centered all time varying covariates, with the exception of age, around each person's adult-mean (see: Horney, Osgood, & Marshall, 1995; Laub & Sampson, 2003; Wittebrood & Nieuwbeerta, 2000). This implies that when we analyze change within individuals, we then examine deviations in any given year from each person's mean level of life circumstances in the period from age 12 to maximally 50. To analyze differences between persons, we include the mean time spent in life circumstances from age 12 to 50 as stable individual characteristics in our models. This centering scheme accounts for the possibility that some people are in a certain state because they have a higher propensity to be so (Laub & Sampson, 2003). Appendix A provides an overview of all explanatory variables.

Finally, prior studies have shown the importance of controlling for the effects of incarceration in longitudinal studies on criminal behavior (Eggleston, Laub, & Sampson, 2004; Horney et al., 1995; Piquero et al., 2001). To control for possible effects of incarceration in the CCLS-data, years during which the individual was incarcerated for more than six months were dropped from the dataset.

4.4 Hierarchical linear models

Our main goal here is to explain differences in offending both within individuals over time as between individuals. To analyze our data we use hierarchical or multilevel linear models for nested or repeated measures data (Bryk & Raudenbush, 1992; Goldstein, 1987) that distinguish between two levels: a year (or within individual) level, and a (between) individual level. In these models, random effects at the between-individual level account for variation between individuals unexplained by the structural model. Hierarchical linear models have the advantage that, when estimating coefficients, they adjust for the correlation of error components of the various levels and have become widely used in the developmental and life course criminological literature (Horney et al., 1995; Laub & Sampson, 2003; Lauritsen & Davis Quinet, 1995; Wittebrood & Nieuwbeerta, 1999; 2000).

To test our hypotheses regarding the effects of prior offending on future offending we estimate four logistic hierarchical models. In the full model, the log-odds of offending in each year i for individual j are given by:

$$Y = \ln[(Crime_{ij})/(1 - p(Crime_{ij}))] \tag{1}$$

$$= \beta_{0j} + \beta_{1j} PO_{ij} + \beta_{2j} YPO_{ij} + \sum \beta_{qj} LC_{qij} + \varepsilon_{ij}$$

$$\beta_{0j} = \gamma_{00} + \sum \gamma_{0qj} LC_{qj} + \mu_{0j}$$

were PO_{ij} indicates whether individual j has offended in the ten years prior to year i and YPO_{ij} indicates the natural logarithm of the number of years since that last offence. Together, β_1 and β_2 represent the effect prior offending has on future offending. LC_{qij} refers to the indicators of life circumstances that may vary over time.

$\sum \beta_{qj}$ represents the effects of these q time varying life circumstances.

At the between-individual level, γ_{01} represents the effects of stable, observed between-individual differences, operationalized as the mean time an individual j spends in certain life circumstances between age 12 and 50. μ_{0j} represents the variation in offending attributable to stable unobserved individual differences.

To capture the effects of continuous change, the above-mentioned model can be augmented with an indicator of the individual's criminal history. This model will only be applied to the CCLS-sample since that sample includes a substantial number of frequent offenders.[11] The model including indicators for continuous change has the following equation:

$$Y = \ln[(Crime_{ij})/(1 - p(Crime_{ij}))]$$

$$= \beta_{0j} + \beta_{1j}PO_{ij} + \beta_{2j}YPO_{ij} + \sum \beta_{qj} LC_{qij} + \beta_{4j}CC_{ij} + \beta_{5j}(CC_{ij} * PO_{ij}) + \beta_{6j}(CC_{ij} * YPO_{ij}) + \varepsilon_{ij} \quad (11)$$

$$\beta_{0j} = \gamma_{00} + \sum \gamma_{0qj}LC_{qj} + \mu_{0j}$$

where CC_{ij} denotes the indicator for continuous change operationalized as the natural logarithm of the total number of different times prior to year i in which individual j committed offences, and $CC_{ij} * PO_{ij}$ denotes the interaction between CC_{ij} and PO_{ij}. If the process of continuous change contributes to continuity in offending, β_4 will be significantly greater than zero. In addition, according to our hypothesis β_5 should be negative since the episodic effect of prior offending is expected to decrease with the total number of offences in the preceding criminal career. Finally, another interaction variable $CC_{ij} * PO_{ij}$ is added allowing the rate with which the episodic effect of prior offending decreases over time to differ depending on the total number of offences in the preceding criminal career. This interaction variable accounts for the possibility that the effect of episodic change not only decreases with the number of prior offences in the preceding criminal career, but also that this effect wears off quicker the higher the total number of prior offences.

The major advantage of the logistic hierarchical models used is that these can test whether the association between previous and subsequent behavior can be explained by heterogeneity or state dependence (Lauritsen & Davis Quinet, 1995; Wittebrood & Nieuwbeerta, 2000). For any given individual, the disturbance terms across time will be corre-

11. Since continuous change means that the total volume of an individual's criminal history has an impact on future offending, a non-trivial amount of frequent offenders – those with at least some criminal history – are necessary to test for the effects of continuous change.

lated because of their common component μ_j. This correlation is generally referred to as rho (ρ), where:

$$\rho = corr[\varepsilon_{ij} + \mu_i, \varepsilon_{ij+1} + \mu_j] = \sigma^2_\mu / (\sigma^2_\varepsilon + \sigma^2_\mu) \; . \tag{3}$$

Consequently, this rho-coefficient estimates the amount of joint variation in the error terms attributable to persistent between-individual differences (Lauritsen & Davis Quinet, 1995). If the influence of heterogeneity is negligible, rho will be close to zero. If the effect of heterogeneity outweighs the effect of state dependence, this measure approaches 1.

To test whether the association between prior and future offending is best explained by a 'kinds of people' or by a 'kinds of contexts' interpretation, we compare the parameter estimates of two models, namely, the model that only includes indicators of life circumstances (model 2) and the model that also includes an indicator for prior offending (model 3). The coefficient for prior offending captures the state dependence effect. After including this indicator for prior offending, the rho coefficient indicates how much of the unobserved heterogeneity cannot be attributed to state dependence. If, as static theories state, the relationship between prior and future offending is completely attributable to stable individual differences between people, little – if any – change is expected in the rho coefficient after including indicators of prior offending into the model. If, on the other hand, state dependence generates the correlation between prior and future offending, as is assumed by dynamic theories, then adding prior offending will notably decrease the rho coefficient.

5 Results

The self-report data from the 1996 crime survey show that 9.2% of the Dutch population reported a violent offence and 24.1% reported a property offence during the past 25 years (Table 1). A small (2.3%) percentage indicated that they had committed a violent offence in more than one year. 8.9% of the respondents indicated that they had committed property offences in multiple years in the period 1971–1995.

The official data show that 32.9% of the individuals in the CCLS-sample has been convicted for a violent offence at least once and 54.1% for a property offence. This high percentage is no surprise since the CCLS-sample represented those tried in 1977.[12] As in the crime survey, property offences were more common than violent offences. The CCLS-data further show that a large percentage of offenders were convicted several times during the follow-up period. Of the total sample, 16.4% was convicted for violent offences in more than one year and 35.2% was convicted for property offence in multiple years- with 2.5% being convicted in as much as 15 different years.

12. The percentage is not 100% because a number of individuals in the CCLS-sample were either not convicted in 1977 – but instead were acquitted or had their case disposed of by the public prosecutor – or only had convictions for other kinds of offenses like drug- or traffic offenses.

Table 1 shows that in the crime survey, few individuals reported having committed offences in more than two years. This is different in the CCLS-data. Given that our operationalization of continuous change requires individuals to have committed multiple offences we therefore limit our analyses of the effects of continuous change to the CCLS-dataset.

Table 1 Percentage of people having committed offences in a varying number of different years

	violent crime	property crime
Self-report data (N=2,950)[1]		
Number of years in which an offence was committed in the 10 years prior to the survey		
0 years	90.8	75.9
1 years	6.9	15.1
2 years	1.5	4.8
3 years	0.5	2.4
4 years	0.2	0.9
5 or more years	0.1	0.8
Official data (N=4,684)[1]		
Number of years in which convicted during the entire life course up to 2002		
0 years	67.1	45.9
1 years	16.4	18.9
2 years	6.7	8.5
3 years	3.4	6.3
4 years	2.4	3.8
5-9 years	3.6	10.5
10-14 years	0.4	3.6
15 or more years	0.0	2.5

1 percentages based on weighted numbers

5.1 Hierarchical linear models

To test the hypotheses regarding population heterogeneity and state dependence, four models were estimated for each type of crime. The first model includes only an indicator of prior offending, the second model only indicators for life circumstances. Our third model contains both indicators of life circumstances and an indicator for prior offending. Finally, the fourth model also includes a variable indicating the duration of the period since the individual had previously offended (this model is the one presented earlier in equation (1). Table 2 shows the numerical values of the parameter estimates for the effect of prior offending for both types of crime and rho coefficients for the models considered.[13] Table 2 gives the numerical estimates of the effect parameters (b) in log-odds-ratios as well as their exponents, or odds-ratios. These odds-ratios are the odds of commit-

13. Due to space limitations we only include the parameter estimates for the effects of prior offending in tables 2 and 3. A complete table with all the parameter estimates for all models will be provided upon request.

ting an offence versus not committing an offence for an individual with a particular characteristic, divided by the corresponding odds for an individual not having this characteristic.

Table 2 Numerical estimates of logistical coefficients for prior offending (in odds ratios) from binomial hierarchical linear

Self-report data (N_{ind} =2,950 ; N_{years} = 61,473)		**PO**			**YPO**			
		b	SE	exp(b)	b	SE	exp(b)	Rho
Violent crimes								
Model 1	PO	0.774 ***	0.130	2.17				0.135
Model 2	LC							0.235
Model 3	PO + LC	0.747 ***	0.130	2.11				0.137
Model 4	PO + LC + YPO	1.524 ***	0.158	4.59	-0.67 ***	0.133	0.51	0.078
Property crimes								
Model 1	PO	0.715 ***	0.066	2.04				0.103
Model 2	LC							0.176
Model 3	PO + LC	0.709 ***	0.066	2.03				0.103
Model 4	PO + LC + YPO	1.611 ***	0.078	5.01	-0.75 ***	0.058	0.47	0.041
Official data (N_{ind} = 4,684 ; N_{years} = 192,670)								
Violent crimes								0.038
Model 1	PO	1.112 ***	0.037	3.04				0.228
Model 2	LC							0.039
Model 3	PO + LC	1.097 ***	0.037	3.00				0.027
Model 4	PO + LC + YPO	1.564 ***	0.050	4.78	-0.38 ***	0.033	0.68	
Property crimes								
Model 1	PO	1.750 ***	0.026	5.75				0.061
Model 2	LC							0.243
Model 3	PO + LC	1.744 ***	0.026	5.72				0.061
Model 4	PO + LC + YPO	2.595 ***	0.029	13.40	-0.81 ***	0.019	0.44	0.015

5.2 Effects of prior offending

Static theories offer a 'kinds of people' explanation for the association between prior and future offending. These theories predict that once (un)observed individual differences are taken into account prior offending will have no effect on future offending. Dynamic theories on the other hand view prior offending as part of the context that influences the chance of future offending. Table 2 presents the numerical estimates of the effect of prior offending in the basic model (model 1) including only an indicator of prior offending (PO). In the self-report data prior offending has a significant effect on the odds of future offending for both crime types. For violent crime, the odds are about 2.17 (=exp(0.774)) times higher for individuals who have previously committed a violent offence than for individuals who have not. For property crime, prior offending increases the odds of offending by a factor 2. Prior offending affects future offending in the CCLS-data as well. The odds of conviction for a violent crime in a given year for individuals previously convicted for violent crimes, was 3.04 (=exp(1.112)) times higher than that of individuals not previously convicted. A previous conviction for a property crime increased the odds of subsequent convictions 5.75 times. Thus, even when controlling for unobserved heterogeneity in the population, the effects of state dependence are found in both datasets. These

results contradict purely static explanations and show that dynamic explanations of continuity in crime can add explanatory power.

5.3 Effects of life circumstances

While static theories regard the relationship between life circumstances and crime as spurious, dynamic theories do predict a genuine effect of time-varying life circumstances on the likelihood of offending. To test this hypothesis we estimated models including indicators of life circumstances. Since the parameter estimates for the effects of life circumstances are fairly stable across models, we do not present the coefficients for models 2 and 3, but only present those for the fourth model. Table 3 and 4 show the values of the parameter estimates for the effects of life circumstances for both types of crime for the self-report and official data respectively.

Table 3 shows significant *between*-individual effects of the mean time spent in a certain life circumstance up to age 50 (LC_{qj}). Individuals most likely to be separated (either with or without children) thus have higher – respectively 15.85 and 31.37 times higher – odds of committing a violent offence than individuals who remain unmarried and childless. The odds for property offences are 3.80 and 7.89 respectively. Individuals most likely to live in an urbanized area also have increased odds for either offence. Individuals most likely to be employed in the period between 12 and 50 years of age have higher odds of committing a violent offence. While individuals most likely to be schoolgoing have increased odds of committing a property offence.

Some of the *within*-individual effects of time varying life circumstances (LC_{qij}) are significant as well. For property crimes being schoolgoing had a significant effect at the year level: the same individual while schoolgoing experiences an increase in the odds of committing a property offence of 1.63 times (=exp(0.486)). Moving into an urbanized area also increases the odds of committing a property crime. Being married without children seems to decrease the odds for both types of crime: in the years an individual is married without children his odds of committing a violent crime are reduced to almost half of those in the years when he is single. Finally, whilst employed the odds of committing a violent crime are 2.30 times that when not being employed.

The official data show a similar picture (Table 4). Individuals who are more likely to be separated also experience higher odds of conviction, for either type of offence. In addition, the odds of conviction for individuals in the CCLS-sample most likely to be married are lower than those of individuals less likely to be married in the years before age 50.

Again, life circumstances are not only significant at the between individual level, but also have a time varying effect. Being married (with or without children) also reduces the odds of conviction at the within individual level. When married, the odds of conviction for a violent or a property crime the same individual experiences are respectively 0.74 and 0.76 times those then while not married. In sum, these results suggest that, as predicted by dynamic theories, time varying life circumstances affect crime even when observed and unobserved population heterogeneity is accounted for. However, it should also be noted that, most of the effects found are small in magnitude.

Effects of life circumstances could in part explain the correlation between prior and future offending; that is, those married at time one are also likely to be married at time two. Therefore a third model was estimated including both indicators for prior offending as well as indicators for life circumstances. The estimates for the effects of prior offend-

ing in this model are given in Table 2 (model 3 PO+LC). In the CCLS-data the effect of prior offending is slightly reduced when indicators of life circumstances are included in the model. The effects of prior offending however, are still substantial and statistically significant. The reduction in the effect of prior offending in model 3 compared to that in model 1 indicates that part of the effect prior offending has on future offending can be explained by life circumstances. Comparison of the parameter estimates of the effects of life circumstances between model 2 (parameters not given) and model 3 also shows a decline, indicating that in turn part of the effects life circumstances have on crime are explained by the effects of prior offending.

5.4 Heterogeneity, state dependence or both

To compare the relative explanatory power of (un)observed heterogeneity and state dependence in the positive association between prior and future offending we now focus on the rho coefficients as presented in Table 2. The second model that included only indicators of life circumstances produced an estimate for rho of 0.235 for self-reported violent crimes, indicating that 24% of the total error covariance over time is due to unobserved individual specific heterogeneity. When an indicator of prior offending is added to the model (model 3) the rho coefficient is reduced from 0.235 to 0.137 (from 0.176 to 0.103 for property crimes), indicating that part of the association between prior and future offending is due to state dependence. However, the rho coefficient of the third model also indicates that some degree of heterogeneity remains that cannot be accounted for by any other variables in the model.

Rho decreases similarly for the official data. Comparing the second model with the third model rho is reduced from 0.228 to 0.039 for violent crimes, leaving 4% of the total error covariance over time to be explained by unobserved individual specific heterogeneity in a model containing indicators for prior offending as well as life circumstances. For property crimes rho is reduced from 0.243 to 0.061. These results show that state dependence plays an important role in explaining the continuity of criminal behavior, but also that heterogeneity partly explains the association between past and future offending.

5.5 Time elapsed since prior offence

Next, we address our fifth hypothesis that the effect of a prior offence on the likelihood of future offending decreases with time. In the fourth model, a variable was added indicating the number of years since the previous offence. Table 2 presents the parameter estimates for the effect of prior offending for this fourth model (see Tables 3 and 4 for the entire model). As expected in the case of state dependence, the impact of previous on subsequent offending declines over time. Over time, the odds of reporting a violent offence for individuals who previously offended decrease from 4.59 times that of individuals who had not previously offended directly after the initial offence, to 2.19 times[14] that three years after the initial offence. A person who recently committed a violent offence is thus

14. This can be calculated from the estimated parameters since: Exp(1.524+ln(3)*-0.674) = 2.19

Table 3 Numerical estimates of logistical coefficients for model 4 (PO+LC+YPO) (in odds ratios) for self-reported violent and property crimes

	Self-report data (N_{ind} =2,950 ; N_{years} = 61,473)	Violent crimes				Property crimes			
		b		SE	exp(b)	b		SE	exp(b)
	Fixed effects								
γ_{00}	Intercept	-5.041	***	0.462	0.01	-4.612	***	0.263	0.01
	Prior offending								
$ß_{10}$	Prior offending (PO)	1.524	***	0.158	4.59	1.611	***	0.078	5.01
$ß_{20}$	Years since Prior Offending (YPO)	-0.674	***	0.133	0.51	-0.749	***	0.058	0.47
	Time Varying Life Circumstances (LCqij)								
	Unmarried, no children	(ref.)		(ref.)		(ref.)		(ref.)	
$ß_{30}$	Unmarried, children	-0.106		0.880	0.90	0.005		0.593	1.01
$ß_{40}$	Married, no children	-0.577	**	0.249	0.56	-0.211	*	0.123	0.81
$ß_{50}$	Married, children	-0.045		0.308	0.96	-0.106		0.167	0.90
$ß_{60}$	Seperated, no children	-0.133		0.483	0.88	-0.817	***	0.306	0.44
$ß_{70}$	Seperated, children	0.086		0.586	1.09	0.146		0.340	1.16
$ß_{80}$	Student	-0.103		0.291	0.90	0.486	***	0.164	1.63
$ß_{90}$	Job	0.832	**	0.404	2.30	0.261		0.217	1.30
$ß_{100}$	Status	-0.027	***	0.009	0.97	-0.002		0.004	1.00
$ß_{110}$	Urbanization	-0.123		0.080	0.88	0.099	***	0.044	1.10
	Stable Average Life Circumstances (LCqj)								
	Unmarried, no children	(ref.)		(ref.)		(ref.)		(ref.)	
γ_{01}	Unmarried, children	1.838		1.126	6.28	0.049		0.801	1.05
γ_{02}	Married, no children	0.420		0.401	1.52	0.488	***	0.209	1.63
γ_{03}	Married, children	0.180		0.409	1.20	-0.091		0.226	0.91
γ_{04}	Seperated, no children	2.763	***	0.966	15.85	1.334	**	0.576	3.80
γ_{05}	Seperated, children	3.446	***	0.958	31.37	2.065	***	0.622	7.89
γ_{06}	Student	0.061		0.352	1.06	0.660	***	0.201	1.93
γ_{07}	Job	1.162	***	0.437	3.20	0.155		0.234	1.17
γ_{08}	Status	-0.034	***	0.009	0.97	-0.001		0.004	1.00
γ_{09}	Urbanization	0.103	**	0.047	1.11	0.099	**	0.044	1.10
	Control variables								
$ß_{130}$	Woman	-1.473	***	0.129	0.23	-0.578	***	0.064	0.56
$ß_{140}$	Age 12-14	2.514	***	0.370	12.35	1.923	***	0.215	6.84
$ß_{150}$	Age 15-19	2.455	***	0.350	11.65	1.933	***	0.203	6.91
$ß_{160}$	Age 20-24	1.819	***	0.333	6.17	1.675	***	0.192	5.34
$ß_{170}$	Age 25-34	0.975	***	0.322	2.65	1.230	***	0.184	3.42
$ß_{180}$	Age 35-44	-0.083		0.398	0.92	0.813	***	0.202	2.25
	Age 45-72	(ref.)		(ref.)		(ref.)		(ref.)	
$ß_{190}$	Memory	-0.114	***	0.041	0.89	-0.111	***	0.008	0.89
	Random effect								
μ_{1j}	Intercept variance	0.278	***	0.070		0.139	***	0.030	1.15
	Rho	0.078				0.041			

Table 4 Numerical estimates of logistical coefficients for prior offending and life circumstances

	Official data (N_{ind} =4,684; N_{years} = 192,670)	**Violent crimes**			**Property crimes**		
		b	SE	exp(b)	b	SE	exp(b)
	Fixed effects						
γ_{00}	Intercept	-4.607 ***	0.070	0.01	-3.931 ***	0.047	0.02
	Prior Offending						
$ß_{10}$	Prior Offending (PO)	1.564 ***	0.050	4.78	2.595 ***	0.029	13.40
$ß_{20}$	Years since Prior Offending (YPO)	-0.381 ***	0.033	0.68	-0.812 ***	0.019	0.44
	Time Varying Life Circumstances (LC_{qij})						
	Unmarried, no children	(ref.)	(ref.)		(ref.)	(ref.)	
$ß_{30}$	Unmarried, children	-0.154	0.095	0.86	-0.054	0.063	0.95
$ß_{40}$	Married, no children	-0.295 ***	0.083	0.74	-0.271 ***	0.058	0.76
$ß_{50}$	Married, children	-0.161 ***	0.066	0.85	-0.109 ***	0.045	0.90
$ß_{60}$	Seperated, no children	-0.118	0.103	0.89	-0.122 *	0.069	0.89
$ß_{70}$	Seperated, children	0.153	0.586	1.17	0.090	0.056	1.09
	Stable Average Life Circumstances (LC_{qj})						
	Unmarried, no children	*(ref.)*	*(ref.)*		*(ref.)*	*(ref.)*	
γ_{01}	Unmarried, children	0.429 ***	0.128	1.54	0.181 **	0.082	1.20
γ_{02}	Married, no children	-1.225 ***	0.171	0.29	-1.699 ***	0.119	0.18
γ_{03}	Married, children	-0.850 ***	0.084	0.43	-1.138 ***	0.056	0.32
γ_{04}	Seperated, no children	0.824 ***	0.155	2.28	0.475 ***	0.106	1.61
γ_{05}	Seperated, children	1.205 ***	0.105	3.34	0.632 ***	0.072	1.88
	Control variables						
$ß_{80}$	Woman	-1.472 ***	0.118	0.23	-0.328 ***	0.050	0.72
$ß_{90}$	Age 12-14	-2.308 ***	0.298	0.10	-0.364 ***	0.096	0.69
$ß_{100}$	Age 15-19	1.064 ***	0.084	2.90	1.303 ***	0.054	3.68
$ß_{110}$	Age 20-24	1.269 ***	0.075	3.56	1.037 ***	0.049	2.82
$ß_{120}$	Age 25-34	0.905 ***	0.067	2.47	0.642 ***	0.045	1.90
$ß_{130}$	Age 35-44	0.532 ***	0.069	1.70	0.356 ***	0.046	1.43
	Age 45-72	*(ref.)*	*(ref.)*		*(ref.)*	*(ref.)*	
	Random effect						
μ_{1j}	Intercept variance	0.090 ***	0.007		0.050 ***	0.004	1.05
	Rho	0.027			0.015		

more likely to reoffend than a person who has committed a violent offence many years ago. For property offences the odds drop from 5.01 to 2.19 over the first three years. After five years the odds of reporting a property offence are still 1.50 times that of individuals who did not previously offend. Official data show a similar pattern. The odds of conviction for a violent offence for individuals who were previously convicted for a violent offence vary from 4.78 times that of previously unconvicted individuals to 2.59 times those, five years after the previous offence and 1.99 times those, after ten years. Prior property offending increases the odds of conviction for a subsequent offence 13.40 times. Ten years after the initial offence the odds of conviction for a property offence for individuals previously convicted for a property offence are still double (2.07) those of individuals

not previously convicted. Thus, while the effect previous offending has on subsequent offending declines over time, the effects of prior offending reverberate for a long time.

5.6 Continuous change

Finally, we test our hypotheses regarding the effects of continuous change. In order to do so, four additional models were estimated for the CCLS-data only, the number of frequent offenders in the self-report data being too small to meaningfully estimate the effects of continuous change. These models mirror the first four models but were augmented with indicators for the total number of prior convictions and their interaction effects. If the odds of committing an offence are subject to continuous change we would expect the total number of prior offences to have a positive influence on the chances of future offending. Table 5 provides the numeric estimates of the effects of episodic and continuous change and its interactions for the CCLS-data. Table 6 provides all estimates of the most extended model (model 8).

First, Table 5 shows that the total volume of an individual's criminal history positively influences the odds of offending for both types of offences (the CC-column in model 5). The parameter estimates imply that after having committed three violent offences the odds of committing a subsequent violent offence increase 2.49 (=exp(ln(3)*0.829)) times. After more than ten violent offences the odds of committing a subsequent violent offence have increased more than sevenfold. The odds of committing a property offence increase 2.13 times after three offences, to 5.22 times after ten offences. When the total number of preceding property offences is statistically controlled for, the state dependence effect of prior offending is still large and significant, though not as large as in model 1. This suggests that on the one hand continuous change does not offer an alternative explanation for the positive association between past and future offending: recent prior offending still has an additional 'episodic' state dependent effect. On the other hand it also suggests that in the previous models individuals chronically committing offences are inflating the estimates for the episodic effect of prior offending.

Finally, we test the hypothesis that the state dependent effect of prior offending decreases the more offences one has previously committed. As expected and indicated by the significance of the CC*PO interaction terms in model 5, the short-term influence of a prior violent offence on future violent offending decreases as an individual progresses in his criminal career. While initially increasing the odds of conviction for a violent offence 2.71 times, after having committed 20 previous offences recent prior offending increases the odds of conviction for a violent offence 2.23 times. The episodic effect of prior violent offending thus seems to be inversely related to the total volume of the individual's criminal history. Contrary to our expectations however, the episodic effect of prior offending in property offences increases as the total number of previous property convictions increases.

Table 6 shows the parameter estimates for life circumstances in the most complete model (model 8). Comparing the parameter estimates for the effects of life circumstances between models *without* (Table 4) and *with* (Table 6) indicators of continuous change show many to decline, indicating that, as with prior offending, part of the effects that life circumstances have on crime can be explained as continuous change.

Table 5 Numerical estimates of logistical coefficients for prior offending and continuous change (in odds ratios) from binomial hierarchical linear models for officially

Official data (N_{ind} = 4,684; N_{years} = 192,670)		**PO**			**CC**			**CC*PO**			**YPO**			**CC*YPO**			
		b	SE	exp(b)	b	SE	exp(b)	b	SE	exp(b)	b	SE	exp(b)	b	SE	exp(b)	*Rho*
Violent crimes																	
Model 5	PO + CC + PO*CC	1.060 ***	0.042	2.89	0.829 ***	0.081	2.29	-0.204 ***	0.086	0.82							0.004
Model 6	LC + CC				0.852 ***	0.039	2.34										0.039
Model 7	PO + LC + CC + CC*PO	1.055 ***	0.042	2.87	0.827 ***	0.082	2.29	-0.211 ***	0.076	0.81							0.005
Model 8	PO + LC + CC + CC*PO + YPO + CC*YPO	1.487 ***	0.062	4.42	0.789 ***	0.081	2.20	-0.215 ***	0.097	0.81	-0.364 ***	0.044	0.69	-0.003	0.046	1.00	0.003
Property crimes																	
Model 5	PO + CC + PO*CC	1.361 ***	0.053	3.90	0.689 ***	0.053	1.99	0.174 ***	0.053	1.19							0.003
Model 6	LC + CC				1.305 ***	0.017	3.69										0.011
Model 7	PO + LC + CC + CC*PO	1.361 ***	0.032	3.90	0.694 ***	0.053	2.00	0.169 ***	0.053	1.18							0.003
Model 8	PO + LC + CC + CC*PO + YPO + CC*YPO	1.977 ***	0.041	7.22	0.521 ***	0.053	1.68	0.298 ***	0.055	1.35	-0.582 ***	0.032	0.56	-0.129 ***	0.023	0.88	0.000

Table 6: Numerical estimates of logistical coefficients for prior offending and life circumstances for model 8 (PO+LC+CC+CC*PO+YPO+CC*YPO) (in odds ratios) for officially recorded violent and property crimes

	Official data (N_{ind} =4,684; N_{years} = 192,670)	**Violent crimes**			**Property crimes**		
		b	SE	exp(b)	b	SE	exp(b)
	Fixed effects						
γ_{00}	Intercept	-4.834 ***	0.046	0.01	-4,569 ***	0,052	0,01
	Prior Offending						
$ß_{10}$	Prior Offending (PO)	1.487 ***	0.062	4.42	1.977 ***	0.041	7.22
$ß_{20}$	Continuous Change (CC)	0.789 ***	0.081	2.20	0.521 ***	0.053	1.68
$ß_{140}$	Continuous Change*Prior Offending (CC*PO)	-0.215 **	0.097	0.81	0.298 ***	0.055	1.35
$ß_{150}$	Year since Prior Offending (YPO)	-0.364 ***	0.044	0.69	-0.582 ***	0.032	0.56
$ß_{160}$	Continuous Change*Years since Prior Offending (CC*YPO)	-0.003	0.046	1.00	-0.129 ***	0.023	0.88
	Time Varying Life Circumstances (LCqij)						
	Unmarried, no children	*(ref.)*	*(ref.)*		*(ref.)*	*(ref.)*	
$ß_{30}$	Unmarried, children	-0.171 *	0.092	0.84	-0.099	0.063	0.91
$ß_{40}$	Married, no children	-0.283 ***	0.080	0.75	-0.226 ***	0.058	0.80
$ß_{50}$	Married, children	-0.122 *	0.063	0.89	-0.025	0.046	0.98
$ß_{60}$	Seperated, no children	-0.186 *	0.100	0.83	-0.197 ***	0.070	0.82
$ß_{70}$	Seperated, children	0.112	0.078	1.12	0.074	0.057	1.08
	Stable Average Life Circumstances (LCqj)						
	Unmarried, no children	*(ref.)*	*(ref.)*		*(ref.)*	*(ref.)*	
γ_{01}	Unmarried, children	0.338 ***	0.113	1.40	0.084	0.073	1.09
γ_{02}	Married, no children	-1.068 ***	0.152	0.34	-1.261 ***	0.110	0.28
γ_{03}	Married, children	-0.740 ***	0.075	0.48	-0.838 ***	0.052	0.43
γ_{04}	Seperated, no children	0.644 ***	0.138	1.90	0.375 ***	0.093	1.45
γ_{05}	Seperated, children	0.980 ***	0.093	2.66	0.508 ***	0.064	1.66
	Control variables						
$ß_{80}$	Woman	-1.371 ***	0.113	0.25	-0.165 ***	0.048	0.85
$ß_{90}$	Age 12-14	-2.017 **	0.290	0.13	0.202 **	0.100	1.22
$ß_{100}$	Age 15-19	1.378 ***	0.083	3.97	2.002 ***	0.059	7.40
$ß_{110}$	Age 20-24	1.561 ***	0.075	4.76	1.630 ***	0.053	5.10
$ß_{120}$	Age 25-34	1.089 ***	0.067	2.97	0.928 ***	0.046	2.53
$ß_{130}$	Age 35-44	0.59 ***	0.067	1.80	0.413 ***	0.047	1.51
	Age 45-72	*(ref.)*	*(ref.)*		*(ref.)*	*(ref.)*	
	Random effect						
μ_{1j}	Intercept variance	0.011 ***	0.002		0.000	0.000	1.00
	Rho	0.003			0.000		

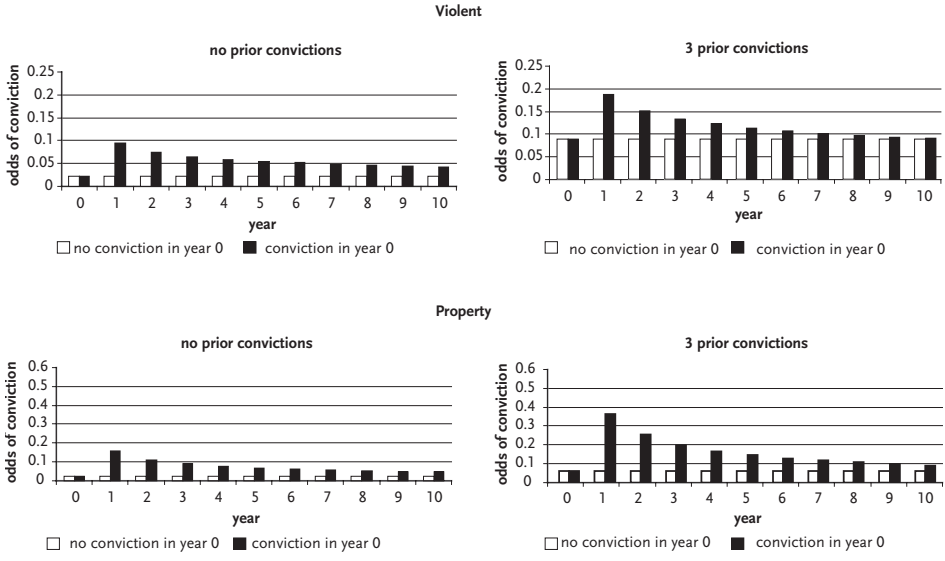
Furthermore, comparing the rho coefficients of model 2 (Table 2) with those of model 6 (Table 5) for the CCLS-data shows that adding an indicator for the total number of previous offences leads to a substantial reduction in the rho coefficient. This indicates that a large part of the correlation between past and future offending can be attributed to continuous change. When the episodic effects of prior offending are incorporated in the

model (model 7) rho is even further reduced. Again this shows that continuous change is not an alternative for the episodic effects of prior offending. Part of the correlation between past and future offending is thus due to a state dependent effect, even when indicators for continuous change are incorporated in the model. The rho's approach zero for the most complete models – those including indicators for continuous as well as episodic change – for both types of offences. This indicates that the association between prior and future offending in the official data is almost entirely generated by the long-term and short-term effects of prior offending.

Finally, model 8 shows that the decline in the episodic effect becomes more marked with each additional conviction, as indicated by the negative parameter estimate for the interaction between the total number of convictions and the number of years elapsed since the most recent conviction (CC*YPO Table 5 model 8).

Implications of these results are shown in Figure 2. Based on the parameter estimates of the most extended model (model 8) for the official data as represented in Table 6, this figure shows the chances of being convicted for two hypothetical men aged between 25 and 34, who are not married and do not have children. One of them is convicted in year 0 while the other is not. This figure clearly shows that an initial conviction increases the likelihood of conviction, and, while decreasingly so, has a prolonged effect on the chance of being convicted a second time. The white bars also show the initial chance of conviction to increase as the total number of previous convictions increases, while the black bars indicate that the episodic effect of prior offending changes over the criminal career.

Figure 2 Risk of subsequent convictions after prior offending: both continous and episodic change for official data (based on model 8)



6 Conclusions

Existing developmental criminological theories emphasize either population heterogeneity or state dependence in the explanation of the stability in crime over time. Theories emphasizing population heterogeneity can be said to offer a 'kinds of people' explanation: depending on their criminal propensity, individuals are as likely to commit crimes at one moment as they are the next. Theories emphasizing state dependence can be said to offer a 'kinds of contexts' explanation: prior criminal behavior alters the individual or his social relationship in such a way that future crime becomes more likely. In this article, we set out to further examine whether continuity in crime is due to population heterogeneity, state dependence, or both, using two large, nationally representative datasets.

Our findings show a substantial effect of prior offending on future offending for both violent as well as property crimes in both self-report as well as official data. A small part of the effect prior offending has on crime is explained by the effect prior offending has on life circumstances, which in turn we find to influence crime. In addition, we find the effect of prior offending on future offending to decline over time. However, our data also show that some degree of heterogeneity remains, at least in the self-report data that is not accounted for by either prior offending or the time varying effects of life circumstances. In the official data however, only a negligible amount of heterogeneity remains once the effects of both state dependence and continuous change are accounted for. Taken together, our findings formally corroborate a mixed model, allowing for both enduring individual differences in criminal propensity and differences in behavioral contexts to influence an individual's likelihood of offending. At the same time our findings – especially those for the official data – suggest that the role for population heterogeneity in the etiology of crime is comparatively limited. Our finding of a substantial state dependent effect in the CCLS-conviction data is in line with that of Bushway et al. (1999) and Ezell & Cohen (2005). The effects of state dependence in the CCLS are even more pronounced than in the crime survey data. Unlike other studies using official data (Nagin & Farrington, 1992a, 1992b)(Paternoster et al., 1997) we find population heterogeneity to play only a marginal role in the continuation of offending. Differences in sample composition – high-risk juveniles compared to a representative sample of all individuals exiting the Dutch legal system (Nagin & Farrington, 1992a, 1992b) –, time frame of the study (Paternoster et al., 1997), or the age-span between earlier research and the present study may have contributed to that.

In addition to the episodic state dependence effect, our findings suggest that a long-term effect we labeled continuous change, contributes to continuity in crime. We find that the total number of convictions in the individual's entire preceding criminal career is positively related with the odds of future offending. In addition we find the episodic effect of prior offending to decrease as the total number of prior convictions increases. However caution is warranted in interpreting this effect as a long-term but nevertheless state dependence effect. Alternatively it could be argued that prior criminal behavior signals criminal propensity (Gottfredson & Hirschi, 1990: 107) and that criminal history becomes a better proxy of criminal propensity as the number of offences increases. If that were the case, the criminal propensity of chronic offenders is systematically underestimated in the beginning of their criminal careers. Estimates would improve as chronic offenders can a posteriori be labeled as such based on their elaborate criminal histories.

Although we render this interpretation unlikely given the above results on episodic change, to test this interpretation an additional a priori measure of criminal propensity, independent of criminal behavior, would be necessary. If such a measure is added to a model also incorporating a variable denoting the overall number of prior offences, the latter is expected to decrease dramatically if it were just an indicator of criminal propensity. If not, then the total number of previous offences reflects a long-term state dependence effect causing criminal behavior to 'wear in' in an individual's behavioral repertoire thus giving rise to behavioral continuity.

Our findings reflect on criminal policy in a number of important ways. First, we find prior offending to increase the odds of future offending, meaning that the benefits of keeping an individual from committing a crime not only include the avoided costs of the instant crime, but also that of future crimes (Nagin & Paternoster, 1991). Second, we find that the effects of prior offending decrease with time. Efforts in refraining an individual from crime are thus best concentrated in the period directly after the offence. Third, our analyses on continuous change suggest that the increase in the odds of committing a subsequent offence after each additional offence diminishes with the number of offences committed. The long-term benefits for interventions preventing an individual from crime would thus be greater for those whose criminal history consists of only few offences. More generally, our results show that continuity in criminal behavior for a large part arises from dynamic processes. This holds the promise that insight in these long-term processes can eventually lead its forces to be restructured to expedite change instead of maintaining continuity.

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Appendix Means and standard deviations of the variables used

		Self-report data				Official data			
		1995		1971-1995		1977		up to 2003	
		(N=2,762 individuals)[1]		(N= 61,473 years)		(N = 4,684 individuals)		(N=192,670 years)	
Variabele	range	mean	std. dev.	mean	std. dev.	mean	std. dev.	mean	std. dev.
Dependent variable									
Offending									
Violent crimes	0-1	0.02	0.14	0.01	0.08	0.08	0.27	0.02	0.13
Property crimes	0-1	0.07	0.25	0.04	0.18	0.25	0.43	0.05	0.22
Explanatory variables									
Time Varying Life Circumstances									
Unmarried, no children	0-1	0.21	0.41	0.31	0.46	0.54	0.50	0.43	0.49
Unmarried, children	0-1	0.00	0.06	0.01	0.07	0.02	0.15	0.03	0.18
Married, no children	0-1	0.37	0.48	0.28	0.45	0.09	0.29	0.14	0.34
Married, children	0-1	0.30	0.46	0.34	0.47	0.26	0.44	0.27	0.44
Seperated, no children	0-1	0.09	0.28	0.04	0.20	0.03	0.16	0.07	0.25
Seperated, children	0-1	0.03	0.17	0.02	0.14	0.07	0.25	0.07	0.26
Student	0-1	0.11	0.31	0.18	0.38				
Employed	0-1	0.49	0.50	0.48	0.50				
Status (if employed)	18-68	42.63	12.09	41.39	11.50				
Urbanization	0-4	1.93	1.36	1.99	1.37				
Stable Average Life Circumstances									
Unmarried, no children	0-1	0.53	0.28	0.46	0.25	0.48	0.28	0.46	0.27
Unmarried, children	0-1	0.01	0.05	0.01	0.06	0.04	0.12	0.03	0.12
Married, no children	0-1	0.15	0.16	0.16	0.16	0.09	0.13	0.10	0.14
Married, children	0-1	0.29	0.26	0.34	0.26	0.28	0.25	0.30	0.25
Seperated, no children	0-1	0.01	0.05	0.01	0.05	0.03	0.10	0.03	0.10
Seperated, children	0-1	0.01	0.06	0.02	0.06	0.07	0.14	0.07	0.14
Student	0-1	0.34	0.30	0.25	0.24				
Employed	0-1	0.46	0.32	0.50	0.31				
Status (if employed)	18-68	42.86	9.89	41.69	6.65				
Urbanization	0-4	2.00	1.20	2.04	1.19				
Prior offending									
Violent crimes	0-1	0.06	0.23	0.04	0.18	0.10	0.30	0.10	0.31
Property crimes	0-1	0.17	0.37	0.10	0.30	0.26	0.44	0.21	0.41
# of years since prior offending									
Violent crimes	1-10	0.20	1.10	0.14	0.89	0.28	1.21	0.38	1.45
Property crimes	1-10	0.54	1.72	0.38	1.45	0.52	1.54	0.68	1.86
# of prior spells									
Violent crimes	0-25					1.08	0.52	1.17	0.77
Property crimes	0-25					1.45	1.38	1.78	2.21
Control variables									
Sex and Age									
Female	0-1	0.56	0.50	0.57	0.50	0.10	0.30	0.11	0.31
Age 12-14	0-1	0.02	0.12	0.06	0.24	0.02	0.15	0.07	0.26
Age 15-19	0-1	0.07	0.26	0.11	0.32	0.23	0.43	0.12	0.33
Age 20-24	0-1	0.07	0.25	0.12	0.32	0.22	0.41	0.12	0.32
Age 25-34	0-1	0.22	0.41	0.24	0.42	0.28	0.45	0.24	0.43
Age 35-44	0-1	0.23	0.42	0.19	0.39	0.14	0.35	0.23	0.42
Age 45-72	0-1	0.39	0.49	0.28	0.45	0.10	0.30	0.22	0.41
Memory effect: # of years ago	1-10			12.15	7.06				

1 188 respondents were older than 72 in 1995

Chapter 6
General discussion

1 Summary

This study focuses on the way criminal behavior changes as individuals age. By paying attention to both differences in criminal behavior *between* individuals, as well as to differences in criminal behavior *within* individuals over time, this book contributes to the growing field of Developmental and Life course Criminology (DLC).

The study had two central aims. The first aim was describing criminal development over the life course. This book – for the first time in the Netherlands – provided a detailed description of the development of criminal behavior over the life course of a representative sample of Dutch offenders. This study used data from the Criminal Career and Life course Study (CCLS) – a large-scale longitudinal study carried out by the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR). These data contain the officially recorded criminal careers of over 5,000 individuals. They were used to describe participation, frequency, crime mix, and termination of offending and the way these career dimensions vary by offender characteristics. Detailed knowledge of the several criminal career dimensions is important for both developmental theories and criminal policy. Describing the long-term developments in criminal careers from early adolescence to late adulthood provides an opportunity to establish whether offence patterns predicted by these developmental theories can be found in Dutch conviction data. It also puts criminal policies that hook on these theoretical assumptions into an empirical perspective. A detailed description of the long-term offending patterns of the individuals in the CCLS-sample was given in Chapters 2 and 3.

Second, the present study aimed to test rivaling hypotheses derived from criminological theories explaining the way criminal behavior develops over the life course. Three types of theories – general static, general dynamic, and typological theories – were distinguished based on the relative importance that these theories place on between individual differences and contextual changes over time in explaining the development of crime over the life course. General static theories view stable individual differences to underlie only level differences in crime. General dynamic theories emphasize the role of time-varying life circumstances in criminal development. Typological theories predict that different groups of offenders have different criminal trajectories because of qualitative differences between them. Addressing the explanation of offending over the life course, rivaling hypotheses derived from these developmental theories on the influence of age, life circumstances and prior offending on the criminal trajectories were empirically tested using both official data from the CCLS and self report data from a Dutch national crime survey in Chapters 3, 4 and 5.

Below, the findings of the present study are summarized. After discussing the main descriptive findings, the results regarding the hypotheses on the effects of age, life circumstances and prior offending on criminal development are dealt with. Table 1 of Chapter 1 is used as a reference. Subsequently, the second part of this chapter discusses the implications of these findings for the different types of DLC-theories and the criminal policies connected to these ideas about the way crime develops over the life course. This final chapter concludes with a review of the data and methods used in this study and offers avenues for future empirical research and theoretical evolution.

1.1 Describing long-term development in crime over the individual life course

In describing long-term development of crime over the individual's life course, the criminal career can be disaggregated into several distinct and measurable dimensions, including: participation, frequency, crime mix, age of onset, age of termination and career duration. Patterns emerging on these dimensions can then be used to evaluate developmental theories.

Global patterns in the CCLS-data show that most offenders were first convicted during adolescence, embarking on a criminal career with an estimated average duration of nearly two decades. Many offenders were convicted only once or twice during their criminal careers, while few offenders were convicted at a very high rate. Furthermore, early onset was related to both high frequency of offending and relatively long criminal career duration. Criminal career patterns in the CCLS-data thus suggest that a small group of offenders exists whose offending is both frequent and chronic.

Analysis of criminal participation in the 1977–2002-period showed that after 25 years 65.4% of all individuals in the CCLS-sample had been reconvicted for at least one offence. Chances of reconviction were highest in the years directly after the 1977-offence. The average recidivist was reconvicted 9.4 times between 1977 and 2002. A small fraction of offenders (3.0%) was found to be responsible for 30.0% of all of the sample's convictions during the 25 year follow-up. Nearly two thirds (65.5%) of the sample may be considered to have terminated their criminal careers during the follow-up period.

During their entire criminal careers preceding 2002, individuals in the CCLS-sample were convicted for over 45,000 offences. On average, offenders were convicted 10.6 times during their entire career, but, as with recidivism frequency, the distribution of offence frequency during the entire career was highly skewed. In addition, property crimes were most prominent, constituting 44% of the average criminal career. The average age of onset was 20.5 with the peak age of onset between ages 15 and 19. Criminal careers of the individuals in the CCLS-sample had a mean duration of 19.4 years.

Criminal career dimensions varied by offender characteristics. Men were twice as likely to 'participate' in crime as women during the 1977–2003 period. When criminally active, men had an average individual offending frequency twice that of women. Women on the other hand were more likely to be one-time offenders and if they recidivated tended to specialize more in property offences. Those first convicted before age 16 had higher offending frequencies. Early onset was also positively related to criminal career duration.

1.2 Effects of age

Does crime decline with age at the individual level as it does at the aggregate level? Although offering different causal explanations, both general static and general dynamic theories predict that it does (Gottfredson & Hirschi, 1990; Hirschi & Gottfredson, 1983; Laub & Sampson, 2003). While these theories allow for some degree of between-individual variability in criminal development of time, on the whole, they predict that the individual frequency of offending will decrease as offenders age. Typological theories offer a different view. These theories anticipate that, while the majority of offenders desist from crime as they enter adulthood, a small minority persists in their criminal ways (Moffitt, 1993, 1994). To assess whether the effect of age on crime was general or specific, this

study focused on whether there was evidence for criminal trajectories that are distinct in terms of time path from early adolescence (age 12) to late adulthood (age 62). Especially, it aimed to determine whether there was evidence for a small group of persistent offenders, as predicted by typological theories. It further addressed the typological predictions that criminal trajectories are distinct in terms of crimes committed and that enduring individual differences are associated with variation in criminal trajectories.

Substantial between-individual variance was found in the effect of age on criminal development. A small group of offenders was identified whose criminal behavior, compared to other offenders, declined significantly less with age. As their criminal careers advanced, these persistent offenders seemed to specialize in property offences. Furthermore, early onset was found to be predictive of persistence in crime.

Both the rate and shape of criminal trajectories were found to differ significantly between individuals (Chapter 3 and 4). Four offender groups following different developmental trajectories were identified (Chapter 3). The largest group of offenders – making up over 60% of the entire population – had a very low conviction rate. These offenders were named Sporadic Offenders (SO). The trajectories of two other groups showed the familiar teepee-shaped curve with a peak during early adulthood. These two trajectories differed mainly in the average number of convictions. Hence these groups – making up 26 and 10% of the offender population – were labelled Low-level Desisters (LD) and Moderate-level Desisters (MD) respectively. A fourth group could be distinguished with a trajectory significantly less curved. After a steep rise in early adolescence, the conviction rate for this group remained high for the larger part of the adult life period. With reference to the life course persistent offender group predicted by typological theories, this group was labeled High-level Persistent offenders (HP). The group of HP-offenders made up little over 1% of the total offender population.

HP-offenders were shown not to be disproportionately engaged in violent crime (Chapter 3). Instead, HP-offenders tended to specialize in property offences, more so than desisting offenders. Disaggregating offence categories for property and violent crimes showed that as HP-offenders aged, simple theft constituted a growing proportion of their criminal repertoire. In comparison, group theft declined steadily with age while the burglary peaked between 24 and 35 and subsequently declined. This specialization in property offences is not in line with typological theories that anticipate persistent offenders being more versatile in their criminal behavior, showing more victim-oriented offences.

Finally, additional analyses (Chapter 4) revealed that differences in criminal trajectories were related to enduring individual differences. Men tended to show a higher average rate of offending than women. In the CCLS-data, offenders who were first convicted before age 16 were convicted at a higher rate than those first convicted after age 16, the former also tended to be more persistent in their offending behavior. In the self-report data, individuals who had reported childhood behavioral problems were found to have higher annual offending rates than those who had not. However, no between individual differences in the rate of desistance were found for self-reported offences. These findings suggest that different types of offenders exist, who follow different criminal trajectories.

1.3 Effects of life circumstances

Next, this study addressed whether life circumstances influence criminal development. Developmental theories differ in the way they interpret the observed association between criminal behavior and life circumstances. Static theories render this association spurious and claim it results from social selection: individuals ending up in the social environment that fits their characteristics (Hirschi & Gottfredson, 1995). Both dynamic and typological theories however, expect life circumstances to exert a causal influence on criminal development – transitions in life circumstances leading to within individual variation in offending (Moffitt, 1993; Sampson & Laub, 1993). Typological theories further predict that the effects of life circumstances are less pronounced in persistent offenders (Moffitt, 1994, 1997). To play off static, dynamic and typological theories against each other, this thesis asked to what extent life circumstances still influence crime once individual differences are controlled for. In addition, it investigated whether the effect of life circumstances on offending differs between types of offenders.

Contrary to the hypothesis offered by static theories, life circumstances were found to significantly influence criminal behavior even after controls for (un)observed between individual differences were introduced. There was also evidence for a differential effect of life circumstances.

Results showed that married individuals in the CCLS-sample– either with or without children –had lower risks of being convicted (Chapter 4 and 5). The inhibiting effect of marriage was found for both violent and property offences. Being separated whilst having to care for under aged children seemed to increase the risk of offending. The self-report data showed less significant results. Only when separated without children the odds of reporting an (property) offence were lower than compared to when being single and childless. Surprisingly, employment seemed to increase the odds of violent crime.

The present findings also showed that in the CCLS-sample, early onset offenders were affected less by crime inhibiting life circumstances than were offenders who had started their criminal career later in life (Chapter 4). In fact, early starters were affected less than half as much. Having children out of wedlock however, significantly increased the risk of offending for early starters but not for late starters. No between-individual variations in the effect of life circumstances was observed in the self-report data. Results from the official data seem to question the homogeneity of the offender population: there may be differences between offenders types.

1.4 Effects of prior offending

Prior offending is commonly found to be a good predictor of future offending – those who offended in the past are also likely to offend in the future. Static theories argue that continuity results from stable between individual differences in criminal propensity. Individuals being more or less crime prone from one moment to the next generating stable level differences in offending over time. Dynamic and typological theories on the other hand explain continuity through a process named state dependence – prior offending changing either the offender or his social context in such a way that future offending becomes more likely (Nagin & Paternoster, 2000). As with the effects of life circumstances, typological theories further predict the effect of prior offending to be less pronounced in persistent offenders (Moffitt, 1994). This thesis first addressed whether prior offending affected future offending even after individual differences had been taken into

account. Second, it asked whether the effect of prior offending was negatively associated with the time elapsed since the last offence. In addition, the positive association between the total number of previous offences and future criminal behavior was tested, as was the hypothesis that the additive impact of an earlier offence on future offending was negatively related to the total number of previous offences.

The results showed that prior offending exerted a causal effect on future criminal behavior even when (un)observed between individual differences were taken into account – prior offending making future offending more likely. The catalytic effect of prior on future offending was found to decrease over time. A more extensive criminal history was also associated with an increased likelihood of future offending.

Individuals who had been previously convicted for a violent offence were found to be five times more likely to be convicted for a subsequent violent offence, than were first time offenders. A prior conviction for a property offence even increased the odds of a subsequent property offence by a factor thirteen. In the self-report data a prior offence made the reporting of a subsequent offence of either type five times more likely. The elevating effect of prior offending was found to decrease with the amount of time elapsed since the most recent offence. After three to five years the initial increase in the odds of future offending was halved. Despite the notable decrease over time, the effect of prior offending was found to reverberate for a long time.

The results further showed that the total number of prior convictions was positively associated with the odds of being convicted for future offences. Three previous convictions more than doubled the odds of a subsequent conviction. The effect the total number of previous offences had on the odds of committing future offences was labeled 'continuous change' to differentiate it from the short-term state dependence effect of prior offending. While the short-term state dependence effect of a prior violent offence decreased as the individual offender progressed in his criminal career, the state dependence effect for property crimes was found to increase as the total number of previous property offences increased.

In sum, the dynamic effects of prior offending seem to outweigh the static effect of criminal propensity.

2 Discussion

Just how can the development of crime over the life course best be conceptualized? Is criminal development guided by underlying personal characteristics that continuously influence the individual's risk of committing a crime – those once high on criminal propensity, always high on criminal propensity? Or, is crime best seen as part of the process of becoming an adult – offenders desisting from crime as conventional possibilities unfold with age? Developmental criminological theories have incorporated both the popular idea of continuity as well as that of change to different degrees. In answering the question regarding the favored conceptualization of criminal development, this paragraph discusses the implications of the aforementioned findings within the framework of general static, general dynamic, and typological theories that has guided the formulation of the hypotheses that were tested. Results on the hypotheses are summarized in Table 1.

Table 1 Findings on hypothesis on within individual change across theories

	Age	Life Circumstances	Prior Offending
General static theories	• individual offending frequency does decline with age, but not for all offenders • the effect of age on offending is left largely unexplained by the available data on life circumstances	• life circumstances do affect offending • while social selection explains part of the effect of life circumstances on crime, there is also evidence for social causation	• prior offending does affect future offending • continuity results more from state dependent effects than from heterogeneity in criminal propensity
General dynamic theories	• individual offending frequency does decline with age, but not for all offenders • age graded shifts in life circumstances only explain the age-crime relationship to a limited degree	• life circumstances do affect offending • life circumstances are partly random and the observed association between life circumstances and offending results in part from social causation	• prior offending does affect future offending • continuity results more from state dependent effects than from heterogeneity in criminal propensity
Typological theories	• a small group of persistent offenders shows significantly less desistance from crime during the period of emerging adulthood • age graded shifts in life circumstances only explain the age-crime curve to a limited degree	• life circumstances have a causal influence on crime, but life circumstances affect the criminal behavior of early starters to a lesser extent	• continuity results more from state dependent effects than from heterogeneity in underlying disposition, but the association with state dependence and career length remains unclear

2.1 General static theories

General static theories have made bold claims regarding the development of crime over time many of which were rejected in this thesis. First, general static theories postulate that all aspects of the development of criminal behavior can be explained by just one causal mechanism, namely the enduring influence of a stable individual characteristic coined criminal propensity (Gottfredson & Hirschi, 1986, 1988). Individuals high in criminal propensity are thought to show an early onset of criminal behavior, a high frequency of offending and have criminal careers of a long duration. However, while a core of risk factors was found to be related to all criminal career dimensions, several other factors were found to influence different dimensions in different ways, thereby contradicting the mono-causality postulated by static theories.

Second, general static theories claim that the *influence of age* on crime is direct and cannot be explained by the sociological variables commonly used in criminology (Hirschi & Gottfredson, 1983). Since the age-effect is taken to be unrelated to criminal propensity, static theories anticipate that offenders differ only in the rate of offending, not in the way this offending-rate develops over time. Findings from both our group-based and multi-

level analyses however, indicate that there is substantial variability not only in the intensity with which individuals commit crimes, but also in the way criminal behavior develops over the individual life course.

Third, general static theories have disposed the association between *life circumstances* and crime as spurious due to the process of social selection (Hirschi & Gottfredson, 1995). These theories state that both life circumstances and crime are in the range of influence of criminal propensity: individuals high on criminal propensity being both more likely to offend as well as more likely to experience certain life circumstances. Findings from this study indicate that both *between*-individual differences as well as *within*-individual differences in life circumstances are important determinants of offending behavior. These results contradict the static view that once controls for enduring individual differences are introduced, life circumstances do not influence offending behavior.

Fourth, analogous to life circumstances, general static theories postulate that *prior offending* is not causally related to future offending. The observed association between prior and future offending is claimed to result solely from contemporary continuity: those high on criminal propensity in the past remaining high on criminal propensity in the future, resulting in equally elevated chances of committing an offence in both periods (Nagin & Paternoster, 2000). Again, results from this thesis contradict this static hypothesis. Even when between individual differences in (un)observed criminal propensity were taken into account, prior offending still exerted a significant influence on future criminal behavior.

In sum, the results presented in this thesis suggest that the static view on development offered by general static theories is oversimplified at best. The variability in criminal trajectories as well as the influence life circumstances and prior offending were found to have on the risk of committing an offence compromise both the assumptions of generality and constancy made by these theories. While *between* individual differences do play an important role in the development of crime over the life course, general static theories fail to offer adequate explanations for the *within* individual changes in crime observed over time.

2.2 General dynamic theories

With regard to the age-crime relationship, general dynamic theories predict a *general* pattern of desistance – desistance by default. Offending is predicted to decline with age sooner or later for all offenders. In turn, this overall decline in crime is suggested to result from *general* desistance processes at work. Sampson and Laub's age graded social control theory states that most offenders desist in response to changes in life circumstances that serve as catalysts for behavioral change (Laub & Sampson, 2003: 278–279). While general dynamic theories do allow for between-individual variation in the speed and timing of desistance, they state that no groups following different desistance trajectories can a priori be distinguished. The assumption of distinct offenders groups would imply that the offending trajectories of each group were governed by distinct causal mechanisms, which does not square with the general character of dynamic theories. Results from this thesis cast doubt on the idea of desistance by default as well as on the absence of distinct offender groups and hence on the generality of the proposed desistance processes.

First, it was shown that the *effects of age* on criminal behavior differed between offender groups. Four different offending trajectories could be distinguished in the CCLS-data from ages 12 to 62; the fourth trajectory showing significantly less decline in crime with age than the other three. Hence this trajectory was labeled the high-level persistent trajectory. The existence of a persistent group of offenders, highly criminally active at ages over 50 jeopardizes the idea of desistance by default. This is especially so since the idea of desistance by default is interlinked with the idea that changes in life circumstances are the prime catalysts for behavioral change. Results presented here showed a small group of offenders that persisted in crime during a time in their lives in which crime-inhibiting changes in life circumstances are normative. Second, considerable variance was found in offending trajectories, this variance partly being explained by stable individual characteristics. More specific, an early onset was found to be related with a less steep decline in criminal behavior with age.

General dynamic theories claim age-graded changes in life circumstances to underlie desistance (Laub & Sampson, 2003).[1] Findings from this thesis support the dynamic notion that *life circumstances* influence crime. Various life circumstances were found to be related to crime even when enduring individual differences were controlled for. Especially marriage proved to be a crime inhibiting life circumstance for both violent and property offences. The impact of life circumstances on crime was found to be largest in the CCLS-data. Overall, these findings favor dynamic over static theories. However, the results also showed that, even when age graded shifts in life circumstances within the population were taken into account, the aggregated age-crime pattern still displayed an inverted u-shape. This suggests that other factors than age-bound differences in societal bonding contribute to the age-crime relationship. This refutes the dynamic prediction, that life course transitions play an important role in explaining the shape of the age-crime curve. Lastly, life circumstances were found to differently affect different groups of offenders. Those offenders starting their criminal careers early were affected less by crime-inhibiting changes in life circumstances. This finding is not in keeping with the idea of a general desistance process applying equally to all offenders.

Recapitulating, the prediction of a general tendency towards desistence due to the general age graded pattern of changes in life circumstances made by general dynamic theories did not came true. A small group of offenders seems to counter this prediction by persisting in criminal behavior during a period in which crime-inhibiting changes in life circumstances are most prevalent. Furthermore, at the aggregate level the shape of the age crime curve is not explained by age patterned changes in life circumstances. General dynamic hypotheses regarding the age crime relationship are thus to be rejected.

Finally, expressing their dynamic character, general dynamic theories predict *prior offending* to influence future offending via a process of state dependency (Sampson & Laub, 1997). This thesis provided evidence for this. Prior offending did increase the odds

1. While Laub & Sampson (2003) claim that their theory recognizes the importance of life circumstances *and* age, they also state that maturational or ontogenetic accounts – crime declining with age as a result of the inexorable aging of the organism (Gottfredson & Hirschi, 1990) – do not really offer an explanation – desistance is thought to just 'naturally' happen (Sampson & Laub, 2003). Their general dynamic theory of age graded social control thus only seems to have any merit if the influential balance is weighed heavily towards the effects of life circumstances at the expense of the unspecified effects of age.

of future offending. Part of the influence of prior offending is through the effect prior offending had on life circumstances. In addition, criminal propensity itself may even be subject to change over time, further strengthening the dynamic explanation of development of crime over time.

Taken together, the findings presented in this thesis provide support for the *dynamic* assumptions made by general dynamic theories, but cast doubt on the *generality* in criminal development postulated by these theories. Development of criminal behavior over time is *dynamic* in that changes in life circumstances continue to affect development throughout the entire life course. Prior offending also affects future offending, although this effect may change as individuals progress in their criminal careers. The postponed desistence of persistent offenders – after the period in life crime in which inhibiting changes in life circumstances are common – and the reduced sensitivity to changes in life circumstances for early starters however challenge the assumption of one *general* cause underlying all change in criminal behavior.

2.3 Typological theories

Typological theories stress the importance of qualitative individual differences in explaining the development of crime over the life course. The majority of individuals are predicted to offend only during a limited period of their lives, namely during adolescence. A small minority of individuals however, is anticipated to continuously show a high rate of criminal behavior(Moffitt, 1993; Patterson & Yoerger, 1993). While the criminal behavior of the former is principally generated by contextual variables, that of the latter primarily originates from enduring individual characteristics.

The results presented in this thesis to some extent corroborate the typing of offenders based on the shape of their criminal trajectory: the *effects of age* on offending were not found to be equal for all offenders. While most offenders desisted from crime as they aged, showing only level differences in criminal behavior, the criminal behavior of a small group of offenders was found to show significantly less decline with age. However, two reservations are in place. The first considers the number of groups predicted by typological theories. In Moffitt's original article she distinguished between adolescence limited offenders, life course persistent offenders and boys who did not become involved in crime at all – abstainers (Moffitt, 1993; Piquero, Brezina, & Turner, 2005). Since the trajectory analysis in Chapter 3 was based on official data, implying that all individuals in the sample had at least one criminal case registered by the public prosecutor's office, no abstainers are present in the CCLS-sample. Despite there being no abstainers in the sample, at least four groups could be distinguished. This corroborates findings from prior studies distinguishing four or five trajectories (e.g., Chung, Hill, Hawkins, Gilchrist, & Nagin, 2002; D'Unger, Land, McCall, & Nagin, 1998; Raskin White, Bates, & Buyske, 2001). Recently, Moffitt has provided a possible etiological underpinning for at least one additional group – labeled low-level chronics – whose criminal activity is stable but not frequent (Moffitt, 2003; see also: D'Unger et al., 1998; Nagin, Farrington, & Moffitt, 1995). The question however is, how many groups a taxonomy can incorporate without the theoretical glue that holds the classification together dissolving, causing its scientific and clinical relevance to reduce.

The finding that individuals showing an early onset of problem behavior offended more frequently and were less likely to desist from crime over time supported a second

typological assumption. This finding suggests that some a priori distinction between offenders can be made, but caution is warranted here. Given the nature of the data used in this study a crucial assumption of typological models, namely that offenders show qualitative differences in etiology, largely remained untested. Chapter 4 only allowed for a distinction being made between offender types based on onset age. While an important career feature on which life course persistent and adolescent limited offenders are expected to differ, onset age, especially as it was defined in the CCLS-data is a crude measure possibly not fully capturing the proposed difference between the two offender types. A true test of typological theories would require data on personal and childhood characteristics not available in this study. Combining the Glueck's elaborate data on individual-difference risk factors with the long-term window of their recent follow-up, Sampson & Laub (2003b) found that while childhood prognoses are to some extent accurate in predicting level differences in crime, they do not predict long-term criminal trajectories.

A third prediction deals with the impact of life circumstances on crime. Typological theories predict that the impact of *life circumstances* on offending will differ between offender types. Early starting offenders were shown to be affected less by changes in life circumstances that are generally considered to have a crime inhibiting effect. Results with regard to the short-term influence of *prior offending*, which were analogously predicted to be less for high frequent offenders, were ambiguous.

Finally, an important prediction interwoven with the explanation of the age-crime pattern and the impact of contextual factors on crime was not confirmed. Typological theories commonly attribute a persistent pattern of criminal behavior to individual characteristics that also promote versatility in offending. On the contrary, Chapter 3 showed that persistent offenders were not more versatile in their criminal behavior. Instead, persistent offenders seemed to specialize in property offences. In addition, early starters seem more sensitive to off-time changes in life circumstances than are late starters, which suggest that the decreased contextual sensitivity of persistent offenders might be limited to crime inhibiting changes in life circumstances.

In sum, while the predictions made by typological theories about the specificity of the age-crime relationship and the effects of life circumstances were born out by the CCLS-data, however, with regard to content, current typological theories were not corroborated at a crucial point. Patterns in crime mix over time for persistent offenders suggest causal processes at work – perhaps connected to drug use – not couched in the most prominent typological theories.

2.4 Stability and change

What do these findings tell us about the common beliefs regarding the development of crime over the life course? Whether the saying 'once a thief, always a thief' has any merit largely depends on how it is interpreted. If it is used to underline the importance of enduring individual characteristics in level differences in crime, then it is corroborated by the results of this study. If one means to say that prior offending positively influences the likelihood of future offending, then again this thesis provides the empirical result for this position. If however, by the use of this saying one states that no change in criminal behavior over time is possible, then this statement must be rejected based on the evidence presented in this thesis. Life circumstances were found to influence the likelihood of offending even when controls for criminal propensity were introduced. This means that

the association between life circumstances and criminal behavior is not just the result of social selection, *but also of social causation*. Changes in life circumstances can lead to changes in crime regardless of criminal propensity.

And what about crime and deviance being part of the sins of youth? Again the level of truth for this statement depends on what exactly is meant by it. If it is used to express the belief that participation in crime is highest during the adolescent years, this thesis provides supportive evidence. If it is meant to say that the frequency of offending commonly peaks before reaching adulthood, again findings from this thesis furnish proof. If however, it is meant to convey that desistance from crime *always* occurs prior to adulthood, then findings from this thesis contradict this argument. While desistance was found to be common, even among those highly criminally active during adolescence and is normative in that sense, a small group of offenders persist far into adulthood. These offenders are still criminally active at a nontrivial rate even in their forties and fifties and for that matter provide the exception that forecloses the rule.

3 Relevance to criminal policy

Criminal career research is of direct importance to criminal justice policy. Detailed knowledge of the career dimensions in which criminal policy is meant to interfere can contribute to a more efficient use of public resources in efforts to reduce crime. While this study was not specifically designed to evaluate any particular prevention effort, formal sanction, or rehabilitation program, the different types of theories that were addressed in this study do entail recommendations of avenues of criminal justice policy worth pursuing. In this section the way our findings reflect on criminal justice policy is discussed within the overarching framework of the three distinguished types of developmental theories.

General static theories ascribe criminal behavior to the concurrence of criminal opportunity and criminal propensity. Prospects for person-orientated interventions – as apart from target-orientated interventions – offered by static theories are limited. Prevention programs aimed at children and their families during childhood, to prevent them from developing an elevated criminal propensity by the time they reach adolescence, are considered the best option to seriously counteract the prevalence of offending (Gottfredson & Hirschi, 1990). While recognizing the effect of incapacitation in preventing individuals from committing crimes in society, static theories do not favor selectively incapacitating frequent offenders (Gottfredson & Hirschi, 1986). Given that the age crime relationship is presumed to be the same for all offenders – regardless of their offending frequency – by the time individuals can be pinpointed as frequent offenders, their offending frequency is expected to be already declining as a result of their increasing age. The decline in criminal behavior with age reduces the benefits of incapacitation in terms of the expected number of offences prevented. Given that static theories consider criminal propensity – once formed – as a relatively unmalleable characteristic, not much is to be expected from rehabilitation programs providing conventional opportunities like work and schooling. High criminal propensity will manifest itself across contexts. On the other hand, based on the same logic, imprisonment is expected not to have any deleterious effects either.

This is different for general dynamic theories since they do allow exogenous factors to influence criminal development throughout the lifespan. While recognizing between individual differences in the inclination to commit crimes, general dynamic theories stress that changes in life circumstances, like work or marriage, change the probability of future crime (Laub & Sampson, 1993). The possibility of change in criminal development is crucial to criminal justice policy in at least three ways. First, if life circumstances inhibit crime, criminal justice policies should be designed to bring about changes in crime-relevant aspects of the offender's social environment – be it bonds to conventional society or association patterns – that can be expected to restrain criminal offending. At the same time dynamic theories are attentive to the possible harmful side effects formal sanctions can have. The second point made by dynamic theories therefore is that incarceration may have a negative impact on job stability, personal relationships and opportunities for building conventional social capital in general, and in doing so rather than deterring individuals from repeated offending making future crime more likely (Sampson & Laub, 1997). Dynamic theories are 'general' theories and thus do not offer grounds to expect the effects of criminal justice policies, either beneficial or detrimental, to differ between offender groups. Thirdly, given their focus on change, general dynamic theories agitate against criminal policies that base decisions made in the criminal justice system solely on the offender's criminal history. Even chronic offenders can experience a change in their life circumstances and when they do, they are as likely to refrain from crime as those without an elaborate criminal history. Selective incapacitation based only on prior criminal records thus is likely to result in an unacceptable increase in type I errors – incarcerating individuals who would not have committed any crimes while free.

Finally, typological theories argue for different types of interventions for different types of offenders. Given the etiology of their behavior, efforts to reduce the participation and frequency of offending for the adolescence limited group would best be aimed at canalizing the influence of deviant peers. When formal interventions are in place these should serve to reinforce conventional opportunities in order to speed up the desistance process and be designed in such a way that they do not result in 'snares' that have just the opposite effect (Shannon, 1988). For the small group of persistent offenders, preventive action should primarily focus on the neurobiological impairments and negative childhood social interactions that set them off on a pattern of frequent and chronic offending during a substantial part of their lives. Once the life-course persistent pattern becomes set however, the future prospects for this group seem bleak (Moffitt, 1994). Persistent offenders are predicted to lack the capacities to capitalize on conventional opportunities even when offered to them. As a result, the criminal behavior of these offenders is stable over time and not influenced by age. Society is therefore expected to benefit most, in terms of number of offences prevented, if incapacitation policies were primarily targeted at this group.

The current study focused on the development of officially recorded offending between ages 12 and 72. Throughout the study, possible effects of between individual differences in criminal propensity were statistically controlled for because the confounding effects of these differences could influence the obtained results. However, no effort was made – and no data was available – to try to explain these possible differences. As a result, this study does not directly speak on the desirability of prevention efforts aimed at the childhood period. The results from this study do hint at the possible importance of child-

hood developmental outcomes since those who were deviantly engaged at an early age were found to have longer criminal careers and a higher frequency of offending.

The data do speak on the prospects of a policy of selective incapacitation. Offending frequency was found to be highly skewed. A small percentage of the offenders in the CCLS-sample showed both frequent and chronic criminal behavior and could thus be labeled 'career criminals'. While career criminals have been the focal point of selective incapacitation policies, current results question the wisdom of such policies by at least three accounts. First, for selective incapacitation to work frequent offenders must be reliably identified early in their criminal careers. As the trajectory analysis in Chapter 3 showed, High-level Persistent offenders (HP) and Moderate-level Desisting (MD) offenders follow criminal trajectories that are very similar up to their late twenties. A failure to discriminate between HP and MD however will substantially reduce the efficiency of selective policies since erroneously selectively incapacitating desisting offenders will reduce the number of prevented offences per prisoner – and imprison offenders who would likely have desisted when free. Results from the trajectory analysis suggest that the identification of career criminals will be seriously flawed at least until offenders reach their thirties. Second, contrary to the objection raised by general static theories HP do not show a steep decline in crime with age. However, as the analysis in Chapter 3 showed, with increasing age the mix of crimes committed by HP begins to change. Given that career criminals can only be identified by the time they reach their thirties, the crimes prevented by selectively incapacitating these offenders will be increasingly less serious. The reimbursement of the considerable resources needed to incarcerate these offenders will therefore most noticeably be a decline in the rate of petty theft.[2] A third reason to question selective policies is raised by the results of Chapters 4 and 5. The analyses in these chapters show that, regardless of an individual's criminal propensity, exogenous events do alter the likelihood of offending. Selective incapacitation is based on the assumption of stability, which is compromised by the inhibiting effect of life circumstances on criminal development. The possibility of change will thus increase the number of offenders incarcerated under selective policies who would most likely not have offended while free and thus raise both the financial and moral costs of selectively incapacitating frequent offenders. Finally, to put into perspective what can be expected from selective incapacitation, notice that while offending frequency as measured over the entire criminal careers of the offenders in the CCLS-sample was highly skewed, the offence distribution in 1977 was far less skewed – the share of frequent offenders in the total number of convictions in the year 1977 being more balanced. Also notice that nearly half of those convicted in 1977 did not have any prior records. This leads to suggest that in any given year the effect of a policy of selective incapacitation on the annual crime rate is much less than a cursory appreciation of the skewness of the offence frequency distribution may lead to believe.

Chapter 4 and 5 showed that changes in life circumstances do affect the likelihood of offending even for those who started their criminal career early – and who arguably would be most likely to be of the life course persistent type. Especially being married was found to inhibit crime. The other side of this dynamic picture is that prior offending

2. Let alone the question whether prolonged imprisonment can be considered 'just deserts' for this type of offense.

increased the likelihood of future offending. The fact that exogenous factors can influence criminal development by itself strengthens the idea that rehabilitation is possible and a goal worth pursuing. However, criminal justice officials cannot easily arrange marriages for (ex)convicts. What they can do is implement policies that aim to mimic the mediating factors that actually cause being married to reduce crime. Several of these mediating factors have been suggested in the literature, including increased bonding to conventional society, and changes in association patterns and routine activities. At a bare minimum formal sanctions should be designed to facilitate the continued existence of crime inhibiting life circumstances. This could be realized by using new techniques like electronic house arrest that do not isolate offenders from their conventional social networks, while at the same time interactions with unconventional networks can be discouraged, for example through the use of curfews. Capitalizing on crime inhibiting life circumstances in such a way may help to counteract the deleterious effect prior offending was found to have.

4 Avenues of future research

The first aim of this thesis was to offer a descriptive analysis of the long-term development of criminal behavior. In doing so it provided basic information – unique for the Netherlands – on criminal career dimensions such as the frequency, duration and termination of offending on a representative sample of Dutch offenders over their entire life course. Since many of the topics addressed in this thesis were virtually uncleared in Dutch criminology, choices had to be made what to focus on and what would be the angle of inquiry.

One such choice was to describe both the sample and their criminal behavior as a whole. Both the size and the sampling procedure of the CCLS however bare with it that more specialized attention can be given to certain sub-groups in the sample. Although women only make up a relatively small part of the CCLS-sample as a whole, in absolute numbers the 472 women in the CCLS provide a select sample to establish whether the patterns of crime usually found in male samples are replicated in women. While this thesis has shown many women to be one-time offenders, women who are convicted more than once have criminal careers of substantial length. Offence frequency for women however is low, suggesting long periods of intermittency in offending. Research into the criminal development of women is important to developmental theory since most theories seem to be, either implicitly or explicitly, explaining the criminal behavior of boys and men (Silverthorn & Frick, 1999). Other sub-samples can be imagined based on the types of crimes committed. Data from the CCLS could for instance contribute to what is known about the long-term recidivism of special groups of offenders such as sex offenders (Nieuwbeerta, Blokland, & Bijleveld, 2003). The career data in the CCLS could also be used to analyze what sort of careers lead up to specific types of serious offences like armed robbery or murder.

While this thesis did touch on the topic of crime mix, more specific research questions requiring more sophisticated methods could be answered with the existing data. The changing balance between crime types over time within the criminal trajectories of persistent offenders suggests that some specialization occurs during the course of a

criminal career. Interestingly, careers of moderate level desisters, who also have a high frequency of offending but do not persevere in offending, do not seem to show similar patterns. Continuing issues on specialization versus diversification (offenders committing more different types of crime as they commence in their criminal careers), and aggravation versus de-escalation (offenders committing more serious or rather less serious offences over time), still warrant further research (Farrington, 2003). Eventually, the conviction data in the CCLS will have to be augmented with data from case files to allow for greater crime type specificity.

To sum up, it can be stated that at present not much is known about the development of criminal behavior in the adult years. Few available studies touch on the topic of adult crime. Life course Criminology therefore is to be praised for putting the development of offending during the adult years (back) on the research agenda. Without diminishing the advances made by current longitudinal studies that primarily focused on juveniles, to gain a more complete understanding of criminal behavior and the way it develops over time, future longitudinal studies should be designed in ways that yield detailed information about the prevalence and mix of criminal behavior later in life.

The second aim was to explain development in crime over the life course. Life circumstances and prior offending were used to test hypotheses derived from several types of developmental theories. In this thesis the effects of marriage, parenthood and separation were analyzed in the official data. Self-report data added information on residential, educational, and employment history. Information on other life circumstances, like military service, residential history, employment history, hospitalization history, religiousness, periods of alcohol or drug dependency, and homelessness, could provide further insight in the influence these time varying contextual variables have on the development of officially recorded crime over the life course. Joining the military and moving out of town provide sources of discontinuity in the life course, which, via for example changes in role expectations, informal social control, and association and activity patterns, could inhibit offending. Hospitalization histories could shed light on whether and to what extent health problems underlie desistence in late adulthood. Data on addiction and homelessness would be examples of life circumstances that are most likely to accelerate offending, rather than inhibit it. Data on military service, employment, residential and hospitalization history could be collected using official registrations. Information on topics such as addiction or homelessness would have to come from the men and women themselves via the use of more qualitative research methods.

Overall, life circumstances were found to influence criminal behavior. However, since changes in life circumstances are socially normed, the effect of life circumstances is predicted to depend both on their timing as well as their sequence (Neugarten & Datan, 1973). Having a baby at fourteen will pose different consequences from having a baby at forty. While the current analyses did to some extent control for the sequencing of events, distinguishing six states in life circumstances, additional research into these topics would be very worthwhile. Again, little is known about the effects of certain life circumstances for specific offender groups. Women may respond differently to the birth of a child than men, be it only that they are most likely to end up providing actual physical care. Information on the effects of life circumstances for specific offender groups would provide further tests for the causal mechanisms postulated by different developmental theories.

This thesis used 'participation' data with regard to life circumstances. An individual could either be married or not; no information on the quality of the marriage, or more detailed information on any other life circumstances was available. Sampson and Laub (Laub, Nagin, & Sampson, 1998; Sampson & Laub, 1993) have argued that what is most important in inhibiting criminal behavior is not being married or having a job as such, but the level of attachment or commitment. Central to Moffitt's (1993) typology is that life circumstances lead to increased adult social status. Not all jobs are likely to provide avenues for gaining in adult status, and what may be considered as increasing status may differ in different social strata. While 'participation' in a marriage or a job does signal some degree of bonding, more detailed information on life circumstances and the broader social context in which they occur would provide a greater insight in the causal processes at work.

The primary focus in life course criminology has been on the effects of life circumstances on crime. The process of cumulative disadvantage however entails that prior criminal behavior also influences life circumstances in a way that makes future crime more likely. Prior research has shown that incarceration has a negative effect on later job stability (Nagin & Waldfogel, 1995, 1998; Sampson & Laub, 1993). Results from this thesis also suggest that at least part of the influence of prior on future offending is realized via the effects prior offending has on life circumstances. To what extent prior criminal behavior influences progression in other life course domains besides work – like marriage – is far less clear: do unstable marriages just reflect criminal propensity or do formal sanctions in reaction to crime, like incarceration, stand in the way of long-lasting relationships? The life course perspective may provide a bridge to the neighboring field of life course sociology, to which questions regarding the development of marital, occupational, and residential careers traditionally belong. Naturally, the aforementioned should also be conceived as an invitation to life course sociologists to incorporate the effects of crime into their theories.

More generally phrased, the next step to be taken in life course research on crime should be to try to assess different accounts of criminal development by testing the mediating mechanisms these theories propose to account for the influence of exogenous factors on crime. The adult period is especially suitable for this purpose since many different life course transitions take place after adolescence. The increasing diversity in individual life courses and the timing of important life course transitions beckons for a detailed insight in the causal processes at work if we are to use these insights to predict criminal development at the individual level. Gaining detailed knowledge on the mediating factors explaining the effects of life course transitions also yields theoretical progress since most developmental accounts of crime build on classic criminological theories. Developmental theories should try to articulate their connections to classical criminological theories in ways that enable the testing of rivaling hypotheses, based on these classical theories. Hopefully, in the end, Developmental and Life course research could thus provide the means to thin out the theoretical proliferation that characterizes current day criminology.

As a final remark on life circumstances, it should be noted that Chapter 4 showed that a large effect of age on crime remained even when controls for age graded shifts in life circumstances were introduced. The amplitude of this remaining age-effect suggests that even when many other life circumstances are incorporated into the model this age-effect will not be entirely explained. To denote this remaining effect simply as the direct effect

of age seems unsatisfactory. Future research therefore should focus on explaining what processes coupled with biological age underlie the observed behavioral outcome. Again, criminologists could benefit from insights gained in neighboring disciplines. The relative stability of the age-crime relationship suggests developmental psychology and biology to be worthwhile candidates (Laub & Sampson, 2001; LeBlanc & Loeber, 1998).

Prior offending was found to make future offending more likely. As with the effects of life circumstances, this effect was most pronounced in the official data. Self-reported offences in a population sample usually contain more offences of a less serious nature than offences derived from official data. Both the seriousness of the offence, as well as the 'seriousness' of the subsequent societal reaction could contribute to the discrepancy observed in this study. 'Serious' formal sanctions, such as incarceration, could lead to ending of a marriage. In turn, the prospect of a possible break up could deter the potential offender from committing offences that carry 'serious' penalties. Since little is known about the effects of formal sanctions on the development on crime (Farrington, 2002), a first step would be to incorporate quantitafiable information on formal sanctions – kind of penalty, severity of the penalty, outcome of treatment programs – into criminal career models. As with the effect of life circumstances a worthwhile next step would be a more in depth analyses of whether and why formal sanctions affect criminal trajectories.

Many studies into the effect of formal sanctions on the development of crime use relatively short follow-up periods. Furthermore, due to often-unclear entry requirements, the internal as well as the population validity of the results from these type of studies are often compromised. Given its large and representative sample the longitudinal data in the CCLS provides a good opportunity to analyze the long-term effects of different types of formal sanctions. In addition, longitudinal data from the CCLS could be used in simulation studies to estimate the long-term effects, in terms of the number of offences prevented and the number of individuals incarcerated. Preliminary results from this type of study indicate that benefits of sanction systems based on a static view on criminal development – like 'Three Strikes and You're Out'-in terms of prevented offence are often overstated and that the costs in terms of increase in detention capacity are highly underestimated (Blokland, Bijleveld, & Nieuwbeerta, 2003).

Finally, looking beyond the borders of the data in the current set, a meaningful task would be to analyze the effects of the criminal careers of the men and women in the CCLS-sample on next generations: their children and children's children. Prior research has already shown considerable transgenerational effects of crime (e.g., Farrington, Barnes, & Lambert, 1996; Rowe & Farrington, 1997). Making use of the information on both the timing of criminal acts as well as the timing of parenthood in the CCLS-data could expand that current body of research and provide further insight in the dynamics of interfamilial continuity in crime.

At present, Developmental and Life course Criminology is an energetic field of study. The increasing amount of longitudinal data and the application of more sophisticated analytic techniques leading to theoretical progression and vice versa, amounts to an increased understanding of the development of criminal behavior over time. Studying behavioral development leads one to appreciate the complexity of things often referred to as common knowledge and leaves one perceptive of situations where rashly acting on these assumed commonalities can have undesired results. Something to which, given its moral connotations and societal relevance, the development of criminal behavior is especially vulnerable.

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Samenvatting

Dit proefschrift gaat in op de wijze waarop crimineel gedrag verandert over de levensloop. Hierbij is niet alleen gekeken naar verschillen in crimineel gedrag tussen personen, maar ook naar verschillen in crimineel gedrag binnen personen over de tijd. De algemene doelstelling van dit proefschrift is tweeledig. Met dit proefschrift wordt beoogd:

(1) het beschrijven van de lange termijn ontwikkeling in crimineel gedrag over het leven in Nederland.
(2) het testen van hypothesen afgeleid uit ontwikkelingscriminologische theorieën aangaande de effecten van (a) leeftijd, (b) levensomstandigheden, en (c) eerder daderschap op die ontwikkeling.

De beschrijvingsvraag komt aan bod in de Hoofdstukken 2 en 3. De verklaringsvraag is uitgewerkt in een aantal hypothesen die worden getoetst in Hoofdstuk 4 en 5.

De theoretische achtergrond van dit proefschrift wordt gevormd door drie binnen de ontwikkelings- en levensloopcriminologie gangbare perspectieven op ontwikkeling van crimineel gedrag: het statische, het dynamische en het typologische perspectief. Statische theorieën verklaren verschillen in crimineel gedrag tussen personen vanuit verschillen in criminele geneigdheid tussen personen. Criminele geneigdheid wordt opgevat als een stabiel kenmerk dat op elk moment in het leven van gelijke invloed is op de kans crimineel gedrag te vertonen. Het effect van leeftijd op crimineel gedrag wordt binnen statische theorieën voor iedereen gelijk verondersteld; tussenpersoonsverschillen in crimineel gedrag blijven derhalve het gehele leven constant. Criminele geneigdheid is niet alleen van invloed op de kans op crimineel gedrag, maar beïnvloedt ook de kans dat zich binnen het leven van een persoon bepaalde levensomstandigheden voordoen. Statische theorieën gaan er van uit dat het geobserveerde verband tussen levensomstandigheden (zoals trouwen en het krijgen van kinderen) en crimineel gedrag verdwijnt op het moment dat rekening gehouden wordt met verschillen in criminele geneigdheid. Ook aan eerder crimineel gedrag wordt binnen statische theorieën geen directe invloed op later crimineel gedrag toegekend.

Dynamische theorieën gaan er van uit dat levensomstandigheden wel van invloed zijn op de kans dat een persoon zich crimineel gedraagt, los van iemands criminele geneigdheid. Levensomstandigheden zoals trouwen en het krijgen van kinderen zouden de kans op crimineel gedrag doen dalen. De ontwikkeling van crimineel gedrag over het leven kan tussen personen verschillen omdat niet iedereen dezelfde levensomstandigheden meemaakt op het zelfde punt in zijn of haar leven. Levensomstandigheden kunnen de kans op crimineel gedrag verkleinen, maar ook vergroten. Zo zou een scheiding of eerder crimineel gedrag kunnen leiden tot een negatieve spiraal waarin de kans op herhaald crimineel gedrag juist wordt vergroot.

Typologische theorieën tot slot maken onderscheid in verschillende dadertypen. Terwijl het criminele gedrag van de meeste personen slechts een adolescentie gerelateerd verschijnsel is, bestaat er, volgens typologische theorieën, een kleine groep daders die fre-

quent en langdurig (gewelddadig) crimineel gedrag vertoont. Het criminele gedrag van elk van de beide type daders zou een eigen ontwikkelingsachtergrond hebben. Hierdoor zou ook de invloed van levensomstandigheden en eerder daderschap op de verdere ontwikkeling van het criminele gedrag per dadertype verschillen.

De empirische basis van dit proefschrift wordt gevormd door de Criminele Carrière en Levensloop Studie (CCLS), een grootschalig longitudinaal project dat wordt uitgevoerd door het Nederlands Studiecentrum Criminaliteit en Rechtshandhaving (NSCR) te Leiden. De CCLS bevat justitiële gegevens met betrekking tot de complete criminele carrières van een representatieve steekproef van 5.164 personen van wie de strafzaak in 1977 onherroepelijk werd afgedaan. Naast justitiële gegevens werden van deze personen ook gegevens verzameld omtrent belangrijke levensomstandigheden, zoals trouwen en het krijgen van kinderen. Hiervoor werd gebruik gemaakt van gegevens uit de Gemeentelijke Basis Administratie en het Centraal Bureau voor de Genealogie. Daarnaast wordt op verschillende plaatsen in dit proefschrift gebruik gemaakt van zelf-rapportage gegevens uit de NSCR-survey 1996, een grootschalig zelfrapportage onderzoek onder een representatieve steekproef van Nederlanders van 15 jaar en ouder.

Hoofdstuk 2 beschrijft de lange termijn recidive van de personen in de CCLS-steekproef in de periode 1977-2002 en de ontwikkeling van het criminele gedrag gedurende de gehele criminele carrière voorafgaand aan het jaar 2003. In de 25 jaar na het uitgangsdelict (het delict op basis waarvan een persoon in de steekproef werd opgenomen) bleek 65% van de daders (opnieuw) te worden veroordeeld. De kans op recidive (herhaald daderschap) was het grootst in de jaren direct na het uitgangsdelict. Bijna tweederde (66%) beëindigde zijn of haar criminele carrière voor het einde van de studie. Gedurende hun totale criminele carrières voorafgaand aan 2003, maakten de personen in de CCLS-steekproef zich schuldig aan meer dan 45,000 delicten. De meeste personen in de CCLS-steekproef werden voor het eerst veroordeeld tijdens hun adolescentie, hetgeen een begin vormde van een criminele carrière die gemiddeld bijna twintig jaar duurde. Veel daders werden slechts een enkele keer veroordeeld en maar een klein deel werd vaak veroordeeld. Een vroege start van het delictgedrag bleek samen te hangen met een hoge pleegfrequentie en een lange carrière duur. Carrière patronen in de CCLS-data laten een kleine groep daders zien die vaak en langdurig delicten pleegt. Carrière dimensies varieerden over persoonskenmerken. De kans op recidive voor mannen in de periode 1977-2002 was tweemaal groter dan voor vrouwen. Eenmaal crimineel actief hadden mannen een twee maal zo hoge delictsfrequentie dan vrouwen. Vrouwen hadden een grotere kans om gedurende hun carrière slechts één delict te plegen. Wanneer vrouwen recidiveerden specialiseerden zij zich vooral in vermogensfeiten.

In Hoofdstuk 3 wordt nader ingegaan op het verband tussen leeftijd en criminaliteit en het al dan niet bestaan van een groep persistente daders. Statische theorieën voorspellen dat het ontwikkelingspad van iedere dader ongeveer hetzelfde verloop kent: de invloed van leeftijd op crimineel gedrag is voor iedereen gelijk. Dynamische theorieën laten, als gevolg van variatie in levensomstandigheden meer variatie toe in ontwikkelingspaden. Typologische theorieën tenslotte stellen dat verschillen in ontwikkelingspaden het gevolg zijn van verschillen in ontwikkelingsachtergrond tussen daders. In samenhang hiermee voorspellen zij dat de groep die het langdurigst crimineel gedrag vertoont zich vaker schuldig maakt aan gewelddadige vormen van criminaliteit. In de criminele carrières van personen in de CCLS-steekproef konden vier verschillende ontwikkelings-

paden worden onderscheiden. De grootste groep daders, de 'Sporadische Daders' (63%) werd gedurende hun criminele carrière slechts een of enkele malen veroordeeld. De ontwikkelingspaden van twee andere groepen daders vertoonden veel gelijkenis met de uit cross-sectionele studies bekende leeftijd-criminaliteitscurve: het aantal veroordelingen van deze daders vertoonde een piek tijdens de vroege volwassenheid en nam hierna gestaag af. Samen vormden deze groepen 36% van de totale steekproef. Tenslotte kon een vierde groep worden onderscheiden waarvan het ontwikkelingspad een veel minder afnemend verloop kende. In tegenstelling tot de andere groepen bleef de veroordelingsfrequentie van deze kleine groep (1%), de Hoog-frequente Persistente daders, hoog tot ver in de volwassenheid. Gemiddeld werden personen op het hoog-frequente-ontwikkelingspad in de periode tussen hun 12de tot hun 62ste jaar meer dan honderd maal veroordeeld. Anders dan op basis van typologische theorieën verwacht mocht worden bleken persistente daders zich echter niet disproportioneel vaker schuldig te maken aan geweldscriminaliteit. In plaats daarvan bleek dat persistente daders vooral veroordeeld werden voor vermogenscriminaliteit. Een nadere analyse van de delicttypen liet zien dat persistente daders in de loop van hun criminele carrière zich steeds meer gingen specialiseren in eenvoudige diefstallen. Verder bleken persistente daders het vaakst werkloos en het minst vaak getrouwd te zijn of kinderen te hebben. Hoewel niet alle hypothesen gebaseerd op typologische theorieën werden bevestigd, tonen de analyses in Hoofdstuk 3 wel aan dat de effecten van leeftijd op crimineel gedrag niet voor iedereen hetzelfde zijn en dat er sprake is van een kleine groep persistente daders.

Hoofdstuk 4 gaat in op het centrale dynamische standpunt dat levensomstandigheden een zelfstandige invloed uitoefenen op de ontwikkeling van crimineel gedrag. Bij deze analyses werd onderscheid gemaakt tussen vroegstartende (eerste veroordeling voor het 16de jaar) en laatstartende (eerste veroordeling in of na het 16de jaar) daders en tussen mannen en vrouwen. In de eerste plaats bevestigen de resultaten van de in Hoofdstuk 4 uitgevoerde analyses dat het criminele gedrag van vroege starters een ander verloop kent dan dat van late starters. De veroordelingsfrequentie van vroege starters daalde minder sterk met het toenemen van de leeftijd dan die van laatstartende daders. Ten tweede laten de analyses in Hoofdstuk 4 zien dat levensloopomstandigheden van invloed zijn op de ontwikkeling van crimineel gedrag, ook wanneer rekening gehouden wordt met de mogelijke effecten van verschillen in criminele geneigdheid. In de jaren dat personen uit de CCLS-steekproef waren getrouwd (met of zonder kinderen) hadden zij een kleinere kans om veroordeeld te worden dan in de jaren dat zij niet getrouwd waren. In de jaren dat ze gescheiden waren en bovendien nog minderjarige kinderen hadden was de kans om veroordeeld te worden juist groter. Analyses van de zelfrapportage gegevens uit NSCR-survey leverden meestens gelijksoortige verbanden op, echter deze bleken veelal niet significant. In een nadere analyse van de CCLS-gegevens bleek dat personen die reeds voor hun 16de levensjaar waren veroordeeld in hun criminele gedrag minder beïnvloed werden door levensomstandigheden, dan personen die pas na hun 16de voor het eerst werden veroordeeld. Het inhiberende effect van trouwen was voor vroege starters maar half zo sterk als voor late starters. Het hebben van een kind zonder getrouwd te zijn bleek verder voor vroege starters de kans op een veroordeling te verhogen, terwijl dit voor late starters niet het geval was. De resultaten uit Hoofdstuk 4 bevestigen de dynamische idee dat levensomstandigheden een eigen invloed hebben op de ontwikkeling van

crimineel gedrag. Dat deze invloed voor verschillende dadertypen verschilt pleit voor het typologisch perspectief.

In Hoofdstuk 5 tenslotte, wordt de dynamische hypothese getoetst dat eerder crimineel gedrag bijdraagt aan de stabiliteit van crimineel gedrag over het leven ook wanneer rekening gehouden wordt met mogelijke verschillen in criminele geneigheid. Net als bij het effect van levensomstandigheden voorspellen typologische theorieën dat het effect van eerder daderschap op later daderschap minder sterk is voor persistente daders. In de criminele carrières van personen in de CCLS-steekproef bleek een eerdere veroordeling voor een geweldsmisdrijf de kans(verhouding) op een volgende veroordeling met een factor vijf te verhogen. Een eerdere veroordeling voor een vermogensmisdrijf deed de kans om opnieuw voor een vermogensmisdrijf te worden veroordeeld stijgen met een factor dertien. In de zelfrapportage gegevens (NSCR-survey) bleek een eerder gewelds- respectievelijk vermogensdelict de kans op een volgend delict van hetzelfde type met een factor vijf te verhogen. De 'positieve' invloed van een eerdere veroordeling nam af naarmate er meer jaren na die eerdere veroordeling waren verstreken waarin een persoon niet werd veroordeeld. De analyses in Hoofdstuk 5 laten verder zien dat hoe groter het aantal eerdere veroordelingen, hoe groter de kans is dat een persoon nogmaals wordt veroordeeld. Personen met drie eerdere veroordelingen hadden een driemaal zo grote kans opnieuw te worden veroordeeld dan personen zonder eerdere veroordelingen. Hoewel voor geweldsdelicten werd gevonden dat de invloed van een recente eerdere veroordeling minder was naarmate het totale aantal eerdere veroordelingen groter was, bleek voor vermogensdelicten juist het omgekeerde. Net als levensomstandigheden bleek dat eerder delictgedrag van invloed was op het verloop van de criminele carrière. De statische hypothese dat continuïteit in delictgedrag enkel veroorzaakt wordt door de constante invloed van criminele geneigdheid dient op basis van de resultaten uit Hoofdstuk 5 dan ook te worden verworpen.

Hoe kan de ontwikkeling van crimineel gedrag over het leven nu het best worden begrepen? Wordt de ontwikkeling van crimineel gedrag gestuurd door onderliggende persoonskenmerken die continu de kans op crimineel gedrag beïnvloeden? Heeft, met andere woorden het gezegde: eens een dief, altijd een dief, enige waarde in het verklaren van de ontwikkeling van crimineel gedrag? Of kan criminaliteit het best worden gezien als onderdeel van het proces van volwassen worden – daders die hun criminele gedrag achter zich laten op het moment dat zich nieuwe, conventionele ontwikkelingsalternatieven voordoen? Is, anders gezegd, criminaliteit in de eerste plaats een jeugdzonde? Ontwikkelingscriminologische theorieën hebben tot op verschillende hoogte de populaire ideeën van continuïteit en verandering geïncorporeerd.

De resultaten van het onderzoek waarvan in dit proefschrift verslag wordt gedaan laten zien dat het statische perspectief op de ontwikkeling van crimineel gedrag over het leven op zijn best een oversimplificatie is van het zich voltrekkende ontwikkelingsproces. De invloed van leeftijd op crimineel gedrag bleek, anders dan statische theorieën voorspellen, te verschillen tussen groepen daders. Ook bleken levensloopomstandigheden invloed op de ontwikkeling van crimineel gedrag uit te oefenen. Statische factoren spelen een belangrijke rol bij het verklaren van verschillen in crimineel gedrag *tussen* personen, maar schieten te kort waar dit het verklaren van verschillen *binnen* personen over de tijd betreft.

De hier gepresenteerde resultaten bieden steun voor een dynamisch perspectief op ontwikkeling: levensomstandigheden en eerder daderschap blijven gedurende het hele leven van invloed op de ontwikkeling van crimineel gedrag. De bevinding echter dat voor

een kleine groep daders het criminele gedrag niet afneemt in de periode waarin zich belangrijke veranderingen in levensomstandigheden voortdoen, en dat het criminele gedrag van daders die hun criminele carrière vroeg startten minder beïnvloed wordt door levensomstandigheden, zet vraagtekens bij de notie dat één enkel verklaringsmodel volstaat.

Dat een kleine groep persistente daders in hun ontwikkeling afwijkt van het merendeel van de daders wiens crimineel gedrag snel afneemt wanneer zij volwassen worden, ondersteunt het typologisch perspectief. Ook de verminderde ontvankelijkheid voor de invloed van levensomstandigheden wordt door typologische theorieën voorspeld. Daar staat tegenover dat waar het de inhoud van de criminele carrière betreft, de voorspellingen van typologische theorieën niet worden bevestigd. Patronen in het type gepleegde criminaliteit suggereren dat de ontwikkeling van crimineel gedrag over het leven wordt beïnvloed door causale processen – bijvoorbeeld gerelateerd aan drugsgebruik – die niet zijn opgenomen in de huidige typologische theorieën.

Hoe verhouden deze resultaten zich nu tot de populaire noties aangaande de ontwikkeling van criminaliteit over het leven? Of het gezegde 'eens een dief, altijd een dief' steekhoudend is hangt af van de interpretatie ervan. Als hiermee wordt gedoeld op het belang van stabiele individuele verschillen bij het verklaren van verschillen in de frequentie van criminaliteit, dan wordt dit bevestigd door het onderhavig onderzoek. Als hiermee bedoeld wordt dat eerder crimineel gedrag de kans op later crimineel gedrag vergroot, ook dan bieden huidige resultaten hiervoor ondersteuning. Echter, wordt dit gezegde gebezigd om aan te geven dat verandering in crimineel gedrag over de tijd onmogelijk is, dat blijkt uit dit onderzoek het tegendeel. Levensomstandigheden beïnvloeden de ontwikkeling van crimineel gedrag, ook wanneer rekening wordt gehouden met eventuele verschillen in criminele geneigdheid tussen personen. De associatie tussen levensomstandigheden en criminaliteit berust derhalve niet louter op sociale selectie, maar ook op de causale invloed van sociale context op de ontwikkeling van crimineel gedrag.

En de opvatting dat crimineel gedrag moet worden gezien als jeugdzonden; wilde haren die men kwijtraakt met het stijgen van de leeftijd? Ook voor deze volkswijsheid geldt dat het waarheidsgehalte afhangt van hoe de uitspraak wordt bedoeld. Als er mee wordt bedoeld dat vooral adolescenten zich schuldig maken aan crimineel gedrag, dan biedt dit proefschrift ondersteunend bewijs. Dit geldt evenzo als met die uitspraak wordt bedoeld dat tijdens de adolescentie de frequentie waarmee actieve daders delicten plegen veelal het hoogst is. Wordt echter bedoeld te zeggen dat de frequentie van crimineel gedrag altijd daalt op het moment dat de volwassen leeftijd wordt bereikt, dan wordt dit door de resultaten van het huidige onderzoek weersproken. Hoewel zelfs het criminele gedrag van frequente daders uiteindelijk afneemt, blijft een kleine groep crimineel actief tot na hun vijftigste. Deze groep vormt hiermee de uitzondering die maakt dat van een regel geen sprake is.

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Curriculum vitae

Arjan Blokland was born on the 8th of May 1973 in Sliedrecht, The Netherlands. Between 1991 and 1996 he worked as a police-officer with the Rotterdam-Rijnmond police force. In 1995 he started studying Law at Utrecht University. In 1996, he started studying Psychology, also Utrecht University. He obtained both his LLM degree in Criminal Law and MA degree in Social Psychology in August 2000. In 1999 and 2000 he was a teaching assistant at the Psychology department of the Utrecht University, teaching an evolutionary psychology course. In 1999 he also worked as a junior-researcher at Advies en Onderzoeksgroep Beke. From September 2000 until January 2005 he did his Ph.D. research at the Netherlands Institute for the study of Crime and Law Enforcement (NSCR). From February until August 2005 he was employed as a researcher/lecturer at the NSCR and Leiden University. As of September 2005 he works as a researcher at the NSCR. His current research involves the development of criminal behaviour over the life course.

Arjan Blokland werd op 8 mei 1973 in Sliedrecht geboren. Van 1991 tot 1996 was hij als agent van politie werkzaam bij het regio-korps Rotterdam-Rijnmond. In 1995 begon hij met de studie Nederlands Recht aan de Universiteit Utrecht, afstudeer richting Strafrecht. In 1996 startte hij, eveneens aan de Universiteit Utrecht, de studie Psychologie, afstudeerrichting Sociale Psychologie. Voor beide studies behaalde hij het doctoraal in augustus 2000. Van 1999 tot 2000 werkte hij als student-assistent aan de Universiteit Utrecht, faculteit Psychologie, waar hij het leeronderzoek evolutionaire psychologie verzorgde. In 1999 was hij tevens werkzaam als junioronderzoeker bij criminologisch onderzoeksbureau Advies en Onderzoeksgroep Beke. Vanaf september 2000 tot en met januari 2005 was hij als promovendus in dienst van de Universiteit Leiden en werkzaam op het Nederlands Studiecentrum Criminaliteit en Rechtshandhaving (NSCR) te Leiden. Vanaf februari tot en met augustus 2005 was hij als onderzoeker/docent verbonden aan het NSCR en de Universiteit Leiden. Sinds 1 september 2005 werkt hij als onderzoeker op het NSCR waar hij zich bezig houdt met onderzoek naar de ontwikkeling van crimineel gedrag over de levensloop.