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Disentangling criminal careers for disadvantaged youths

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2015

document version

Publisher's PDF, also known as Version of record

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citation for published version (APA)

Mesters, G. (2015). *Disentangling criminal careers for disadvantaged youths*. Tinbergen Institute.

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Chapter 1

General introduction

Suppose that you were born in a disadvantaged socioeconomic environment where your parents are unable or unwilling to invest sufficiently in you during childhood. In your family alcohol abuse, drug use and unemployment are common, making it questionable whether your early childhood alone was all that pleasant. As a result of your disrupted family life you are experiencing problems adjusting at school. Your grades are low and you are often sent to the principal's office. Your personal problems are not confined to school, also at home things are not going great. You are constantly fighting with your parents and rather spend as little as possible time at home. Instead of fixing your problems it seems a better idea to hang out with your friends and have fun. Since you are under age most of the hanging out takes place on the street. There you often get into trouble and at some occasions the police shows up. Eventually, during a particular wild evening you go too far and get arrested. No big deal, most of your friends have been arrested before and the first time the judge will go easy on you. Unfortunately, this arrest is not the only one. Over the next few months you get arrested a few more times and eventually the magistrate of the juvenile court decides that you have to go to a juvenile treatment facility. In the facility you receive treatment for your behavioral problems and follow classes to increase your education level. In your late teenage years you have to leave the treatment facility and you are put on a train heading into adulthood.

1.1 Introduction

In this thesis we empirically investigate to what extent such a detrimental start to “adult” life, as sketched above, has lasting impacts on socioeconomic adult outcomes, and whether life course transitions, such as those from employment and intimate relationships, can remain to alter adult life outcomes. The goal is to provide a conceptual and empirical framework for studying the effects of childhood outcomes on a variety of adult outcomes, while acknowledging that transitions during adulthood may influence future adult outcomes. The main focus in this thesis is on explaining adulthood offending for disadvantaged youths, but a variety of other socioeconomic outcomes, such as employment, social welfare, drug use and intimate relationships, are additionally studied.

The phrasing of the purpose of this thesis may suggest that the possible consequences of a disadvantaged childhood are either black or white. Black being that childhood entirely determines socioeconomic adult outcomes. This perspective is reflected in the old Jesuit motto: “*Give me a child until he is seven and I will give you the man*”. The motto emphasizes the believe of Jesuit missionaries that when they were given a child at young age they could form the child into a “good” Christian for the remainder of its life¹. In contrast to the black perspective, the white perspective suggests that adulthood outcomes are determined independent from childhood circumstances. Clearly, both black and white perspectives are likely to have some merit and the goal is to assess their relative explanatory power (Nagin & Paternoster, 1993; Blokland & Nieuwbeerta, 2010).

While the separation of effects from childhood and adulthood is of theoretical interest, developing public policies to improve adult outcomes for disadvantaged youths requires additional insights. In particular, it is important to determine at which stage during life what kind of interventions in the form of investments in positive adult life outcomes are most effective and efficient. Many interventions may improve adult life outcomes and this thesis focuses on a subset of these. In particular, we are mainly interested in interventions that improve cognitive and social skills, and interventions that facilitate employment. The term “efficiency” for the interventions is to be seen in

¹The quote is attributed to St. Francis Xavier a Roman Catholic Missionary (7 April 1506 - 3 December 1552).

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a broad perspective where not only monetary aspects are important, but also societal impacts from crime reductions and drugs use are deemed relevant (Cohen, 1998).

The development of a framework that is able to explain socioeconomic adult outcomes in terms of childhood factors and influences from other adult outcomes is a challenging task. This thesis takes a step-by-step approach and relies on insights from criminology, sociology, economics and psychology. In particular, the conceptual framework is based on theories from the aforementioned research areas, which are translated into an empirical framework using mathematical language. The translation facilitates the testing of the framework which relies on observational data and a variety of econometric methods².

In the first step we develop a model for incorporating childhood skills, which are arguably partially determined by personality traits, into a model for adulthood offending. The childhood skills include cognitive skills and a broad array of social skills. While the role of cognitive ability has traditionally been of major interest in social sciences, the role of social skills has received less attention in explaining offending outcomes (Hill, Roberts, Grogger, Guryan, & Sixkiller, 2011). The model incorporates the intuitively appealing notions that multiple skills are important in explaining adult offending and that different skills can be important at different stages in life (Cunha & Heckman, 2007).

Second, a framework is developed that acknowledges that adult outcomes interact with each other over the adult life span. In particular, adult outcomes for offending, employment, social welfare, and many others, may influence each other over the life course in both directions. For example, offending may reduce future employment probabilities and employment may reduce offending (Lageson & Uggen, 2013). Such bi-directional relationships need to be disentangled in order to be able to assess the relative returns from investments in adult life transitions. Some of the adult outcomes are made possible by the economic and political institutions of the Netherlands, the country in which the empirical study takes place. In particular, social welfare out-

²We adopt the following definitions for the conceptual and empirical frameworks. The conceptual framework is the structure of assumptions, principles, and rules that holds together the decomposition of the adult outcomes into childhood and adulthood factors. The empirical framework, or model, is the translation of the conceptual framework into mathematical equations. The unknown structural model parameters of the mathematical equations, which govern the signs and magnitudes of the relationships between the endogenous and exogenous model components, can be directly estimated from the empirical framework when the model components are approximated by observational data.

comes are facilitated by the government of the Netherlands and a “choice” to rely on welfare benefits is thus facilitated by the government. In this sense the framework also provides an assessment for externalities that are created by social welfare policies.

Third, when quantifying the impact of childhood skills on adult outcomes at different stages of adulthood, the aforementioned adult life interactions need to be incorporated. Adult life transitions may act as multipliers that increase or decrease the payoffs from investments in childhood skills. For example, suppose that early interventions aimed at improving social skills reduce offending during adolescence, then the reduction in offending may increase subsequent employment probabilities, over and above the marginal influence of any social skills intervention on employment probabilities. The formulation of this developmental conceptual framework, its translation into an empirical framework and the subsequent testing of the empirical framework constitutes the main contribution of this thesis to the developmental perspective on crime.

The fourth study that is included in this thesis takes a historical perspective for the relationship between employment and crime. The main question that we study is to what extent the effect of unemployment on crime has changed during the last century. While this question is interesting by itself, within the context of the thesis the fourth study is to be regarded as a warning that historical context matters. In particular, it is questionable whether the same childhood skills and adult life transitions that were important in the past will remain to be important in the future. This implies that continuous updating of the relevant components of the framework is required for adequately adjusting public policies for disadvantaged youths.

We test the empirical framework using data for samples of disadvantaged youths who were institutionalized in a juvenile treatment facility in the Netherlands. We include two samples, males and females, that were released in the 1990’s and a sample of males that were released in the 1910’s. The samples compromise a segment of the Dutch population that is overrepresented in offending statistics (Boendermaker, 1999). We consistently refer to the youths as disadvantaged, while we acknowledge that other characterizations such as vulnerable youths or high risk youths are equally applicable.

In total around 4,000 youths are institutionalized in a criminal justice or youth care institution every year in the Netherlands (CBS, 2013). Based on their early encounters with the justice system and/or their behavioral problems, the youths can be regarded

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as pertaining to a disadvantaged subgroup of youths who are at high risk for offending, have low employment participation rates and are relatively often the recipients of social welfare payments (van der Geest, 2011; Mesters, van der Geest, & Bijleveld, 2014; Verbruggen, 2014). While in an institution their behavioral problems are treated and low-level education is provided. In their late teenage years these youths typically leave the treatment facility and their “adult” life starts. Given their troubled backgrounds they are likely to experience problems adapting to adult life roles (Osgood, Foster, Flanagan, & Ruth, 2005). Our goal is to assess what kinds of interventions can best be made to improve the socioeconomic adult outcomes of such disadvantaged youths.

The remainder of this general introduction is organized as follows. In Section 1.2 we discuss a stylized version of the conceptual framework that is developed in this thesis. Section 1.3 links this framework to various criminological, sociological, psychological and economic theories, and Section 1.4 outlines the steps that facilitate the translation of the conceptual framework in an empirical framework. In Section 1.5 we discuss the data that we use to test the framework. The remainder of this thesis is summarized in Section 1.6.

1.2 Conceptual framework

In Figure 1.1 we show a stylized version of the conceptual framework that is developed in this thesis. The figure shows a three-stage developmental process where childhood is summarized by one period and adulthood comprises two periods. In our empirical studies adulthood is divided in many more periods, but the main concepts can be explained by a two-period framework for adulthood.

During childhood individuals develop skills, which in the subsequent chapters are split into cognitive and a variety of social skills. These skills are formed by a hierarchical dynamic process where parental investments and initial birth endowments are the inputs (Heckman, 2006; Cunha & Heckman, 2007). The childhood signals, which for example may include education levels and information from criminal records, are partially determined by the skills. In particular, cognitive skills may increase education levels and social skills may reduce the probability for a juvenile criminal record. The signals provide additional information based on which potential employers, potential romantic partners and law enforcement agencies make decisions (e.g., Weiss,

1995; Pager, 2007; Clark & Mantorell, 2014). Since such entities typically do not have the resources to assess skills themselves, they may rely on signals instead when making decisions.

Given the skills and signals, the youths enter the first adulthood period. In this period all childhood skills and signals may influence the adult outcomes (Heckman, Stixrud, & Urzúa, 2006). We include adult outcomes for offending, employment, social welfare, drug use and intimate relationships. We note that in empirical applications there are always unobserved variables that may influence the adult outcomes. To correct for these influences we use statistical control variables which we discuss in the outline of the empirical framework in Section 1.4.

Next, the youths transition to the second adulthood period. The outcomes in this period are determined by (a) the persistent effects from childhood skills and signals, and (b) the effects from the adult outcomes from the first adulthood period. The effects of the skills and signals are allowed to persist in the second adult period but their payoff may be different. In particular, the arrow that directly relates the skills and signals to the second adult period may imply different signs and magnitudes for the effects of the skills and signals. This construction acknowledges that many skills are formed early in life and may often be considered stable in their ranking thereafter, but their mean-level impact may vary with age (Roberts & DelVecchio, 2000; Cunha & Heckman, 2007; Blonigen, 2010). For example, cognitive ability is found to be stable from age 10 onwards in Hopkins and Brecht (1975), but the impact of cognitive ability on adult outcomes can be different at ages 18 and 30.

The effects from the first adulthood period on the second adulthood period are typically referred to as structural effects in the sense that the first period outcomes have predictive ability for the second period outcomes over and above the effects of the skills and signals³. For example, employment may structurally lower future offending probabilities as it increases the costs associated with offending (Lochner, 2004). In general, all adult outcomes from period one may have structural effects on all adult outcomes in period two. The testing of the empirical framework aims to assess the signs and magnitudes of the structural effects.

³The distinction between structural and spurious effects stems from Heckman (1981a) and Heckman (1981c). Spurious effects are in this sense defined as effects stemming from variables, other than the adult outcome variables, that create correlation between the adult outcome variables in periods one and two. These include the childhood skills and signals, but can also reflect other unobserved variables.

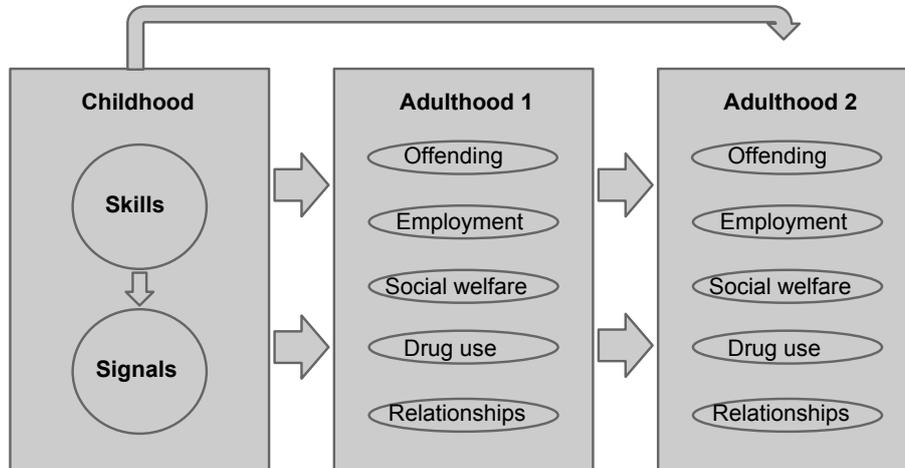


Figure 1.1: Stylized sketch of the conceptual framework that is developed in this thesis

The conceptual framework in Figure 1.1 is translated to an empirical framework in chapter four. Chapters two and three build up to this framework. In particular, chapter two only considers the effects of the childhood skills on adult offending outcomes, whereas chapter three models the interaction between offending, employment and social welfare over the adult life span. The results and methodology that are developed in these chapters are used to guide the decisions for the complete framework that is considered in chapter four.

1.3 Theoretical foundation

The conceptual framework that we sketched in Section 1.2 is based on insights from a variety of theories and perspectives from criminology, sociology, psychology and economics. In particular, the framework encompasses elements from self-control theory (Gottfredson & Hirschi, 1990), social control theory (Hirschi, 1969; Laub & Sampson, 2003) and the rational choice perspective developed in Becker (1968). Additionally, we incorporate the main insights from the recent literature on cognitive and social skill for-

mation that is developed both in economics (e.g., Heckman, 2006; Heckman, Stixrud, & Urzúa, 2006; Cunha & Heckman, 2007, 2008; Borghans, Duckworth, Heckman, & Ter Weel, 2008; Cunha, Heckman, & Schennach, 2010) and psychology (e.g., Lodi-Smith & Roberts, 2007; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Blonigen, 2010).

1.3.1 Criminological and economic theories

The self-control theory of Gottfredson and Hirschi (1990) argues that individual differences in offending are the result of a single higher order personality construct that is labeled self-control. A broad definition of self-control is given by the combination of personality characteristics such as impulsive behavior, conscience development, self-regulation, delay of gratification, inattention-hyperactivity, executive function, willpower and inter-temporal choice (Moffitt et al., 2011). The theory suggests that differences in self-control, at any point in time, can explain the differences in offending, and that other outcomes for aspects such as marriage and employment are essentially driven by self-control. In particular, underlying personal characteristics that select a person into anti-social behavior and delinquency, also select a person into disadvantaged labor market positions, such as welfare and unemployment, disadvantageous marital positions and other adult outcomes.

Since Gottfredson and Hirschi (1990) assume that the level of self-control is established early in life their theory can be regarded as a static theory. In Hirschi and Gottfredson (1983) they hypothesize that no combination of underlying psychological and sociological variables can explain the age-variation in offending that occurs over the life span. Only age itself explains the variation in offending that occurs with maturation. The conceptual framework of this thesis accommodates the notion that skills that are developed early in life, can explain individual-level differences in adulthood offending and other socioeconomic adult outcomes. However, as discussed in detail below, we generally allow the impacts of skills to vary with age and allow structural dynamic effects from other adult outcomes to influence offending as well. Also, we make no attempt to explicitly capture the construct of self-control, but rather investigate more interpretable childhood factors such as cognitive abilities and social skills. Arguably, self-control can be interpreted as a higher-order construct of the included

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childhood skills.

A second prominent perspective for offending is found in social control theory, which states that everybody is capable of offending, but the majority of individuals are restrained by the social bonds that tie them to society (Hirschi, 1969). Delinquency only becomes an option when these social ties are broken or weakened. Sampson and Laub (1993) argue that the relevant social bonds vary over the life course. For instance, social bonds with family, school and peers are important for the adolescence period. When the value that these social bonds hold for an individual exceeds the costs of offending, delinquency will become less attractive. Sampson and Laub (1993) named this value social capital, the importance that the ties to society hold for the individual. After adolescence follows a period that is characterized by exploration with limited parental control, and with the aim of establishing a unique personal identity (Arnett, 2004). In this period a shift occurs in relevant institutions of social control, from family, school and peers to more prominent bonds with partners and co-workers.

Social control theory provides a more dynamic perspective for explaining offending over the life course and we make an attempt to include aspects that represent social bonds in our empirical framework. In particular, we allow adult life outcomes and offending to mutually influence each other over the life course, as such offending can weaken social bonds that may prevent individuals from future employment and intimate relationships (Hirschi, 1969). Sampson and Laub (1997) also suggest the weakening of conventional bonds to society by the gradual process of cumulative disadvantage. Furthermore, Sampson and Laub (1993) identify the dynamic process of childhood antisocial behavior and adolescent delinquency as a possible cause of adult crime as it limits individuals from obtaining adult social bonds. Criminal behavior, and interaction with the criminal justice system, labels an individual as an offender, tainting the individual's self-image and public identity which in turn affects future life outcomes (Nagin & Paternoster, 1991).

The concept of social capital is closely related to the concept of human capital which is prominent in economics. In particular, human capital is loosely defined as the stock of skills, both cognitive and social, that governs the "productivity" of workers (Becker, 1993). Skills can be either innate or learned. Both social capital and human capital are broadly defined concepts, which are used to explain either offending, as in Sampson and Laub (1993), or employment, as in Becker (1993). In our empirical framework we aim

to simultaneously explain employment and offending, as well as other adult outcomes, by the same large set of skills, such that social and human capital are defined by the same concepts. Of course different skills can be important when explaining offending, when compared to explaining employment.

The rational choice perspective for explaining offending is developed in Becker (1968), Ehrlich (1973) and Block and Heineke (1975). Within this framework criminal behavior is viewed as illegal employment and criminal behavior results from the risk-return trade-off between legal and illegal employment (e.g., Ehrlich, 1973; Grogger, 1998). The goal for the individual is to maximize utility, where utility can in principle be derived from a variety of situational characteristics. Some individuals choose crime rather than legitimate employment because they expect to gain more from crime, while taking into account the expected probability and severity of punishment. This perspective also implies dynamic interaction between adult outcomes and is as such reflected in the conceptual framework in Section 1.2.

Finally, the conceptual framework is related to the recent economic perspective on childhood skills formation (e.g., Heckman, Stixrud, & Urzúa, 2006; Cunha & Heckman, 2007, 2008; Cunha et al., 2010). In this perspective the formation of childhood skills is envisioned as a dynamic process in which children accumulate skills from birth endowments and parental investments. The childhood phase is thus considered to last for multiple periods and the final childhood period gives a set of skills that are used to explain socioeconomic adult outcomes (Cunha et al., 2010). The main difference with our conceptual framework is that we treat childhood as a single period. In particular, we do not model the dynamics in the formation of childhood skills, but rather observe these at the end of childhood. Instead, and of major importance, we treat adulthood as a dynamic process and allow adult outcomes to mutually influence each other over the adult life span. This allows us to assess multiplier effects from adult life transitions, which may increase or decrease the cumulative effects from the childhood skills on the subsequent adult outcomes.

1.3.2 The role of skills and personality traits

The dominant theoretical perspectives in life course criminology treat personality traits as fixed constructs that can explain level differences in offending (Nagin & Paternoster,

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1993). They generally do not allow for age-varying effects from different personality traits. Recent research from personality psychology has redefined personality constructs as inherently developmental such that they can explain both individual stable differences as well as differences over the life course for a variety of adult outcomes (Caspi, Roberts, & Shiner, 2005). While many personality traits are found to be consistent in their ordering of individuals in a population over time (Roberts & DelVecchio, 2000), this does not imply that their average effect on adult outcomes is stable over time.

In our empirical framework we accommodate the notion that different skills, or personality traits, can be important in explaining different adult outcomes at different stages of adulthood. For example, social skills may explain adolescent offending, whereas cognitive skills may explain adulthood employment probabilities (e.g., Heckman, Stixrud, & Urzúa, 2006; Agan, 2011; Carneiro, Crawford, & Goodman, 2011). We follow the theoretical framework developed in Blonigen (2010) where it is argued that a variety of personality traits may explain the variation that occurs in offending over the life-span. We adopt this perspective and allow different personality traits to affect adult outcomes for offending, employment, social welfare, drug use and intimate relationships in a dynamic way such that the payoffs from the traits may be different at different stages of adulthood.

1.4 Towards a testable empirical framework

The next important step that is taken in this thesis is the translation of the conceptual framework of Section 1.2 to a set of mathematical equations which summarize the empirical framework. This translation facilitates the testing of the conceptual framework using observational data and econometric methods. Ultimately, the quality of the translation determines whether we are able to provide a realistic empirical assessment of the conceptual framework. The translation requires a tradeoff between complexity and econometric feasibility. In particular, the mathematical relationships can be formulated in an excessively complex manner, which might prevent us from testing the empirical framework using observational data. On the other hand, if the translation is too simple we do not capture the essential features of the conceptual model.

The exact formulation of the empirical framework is discussed in detail in the

chapters below. Here we highlight several features of the conceptual framework and the characteristics of the observational data that need to be taken into account when translating the conceptual framework into the empirical framework. In particular, we briefly discuss the incorporation of skills, omitted variables, simultaneity, non-linearity and the presence of missing values.

The childhood skills that influence the adult outcomes are generally unobserved. Three problems exist when aiming to capture these skills. First, skills are hard to capture by a single or a few variables and it is often unclear which variables are important. This presents a variable selection problem for which many methods, such as shrinkage, bagging and pre-testing, have been proposed (Stock & Watson, 2012). Second, the variables are generally not perfectly observed. In other words, coding differences, timing issues and varying interpretations of different psychologists may impose the presence of measurement error. Third, even when variable selection and measurement error are taken into account missing values are often present. Since typically not all measurements are collected for all individuals, and changes in the types of measurements collected over time, may occur, the presence of missing values is quite common in measurements for childhood skills.

To overcome these issues the empirical framework that is adopted in this thesis proposes two different methods. The first method, which is used in chapter two, uses a variety of personality traits that are assessed by psychologists and translated into norm values to approximate the childhood skills. Data imputation methods are then used to accommodate missing values. This approach has the benefit that the payoffs from the skills are easy to interpret, but the downside is that measurement error remains present. The second method which is adopted in the fourth chapter follows Heckman, Stixrud, and Urzúa (2006) and defines the skills as latent factors that are estimated using a linear factor model which incorporates a large number of measurements for the skills. This approach has the advantage that measurement error is taken into account, but makes the factors more difficult to interpret.

The stylized conceptual framework in Figure 1.1 does not include all aspects of childhood and adulthood that might be relevant for predicting the adult outcomes. For example, we do not model adult outcomes for living situations, which may affect the other adult outcomes. This implies that the translation of the conceptual framework to the empirical framework needs to incorporate unobserved, or omitted,

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variables. Statistically speaking, the presence of omitted variables creates spurious correlation between the subsequent adult outcome variables. To capture spurious correlation we allow for serial correlation in the error terms of the empirical framework. In particular, we either model the error terms using autoregressive processes (Keane, 1994), or we incorporate a dynamic factor structure for the error terms (Pesaran, 2006). Both approaches serve to reduce the influence of omitted variables on the structural relationships that are of interest in the empirical framework.

The simultaneity problem, or reverse causality problem as discussed by Ehrlich (1973), arises when the observed correlation between the adult outcome variables stems from bi-directional causal relationships. For example, offending affects employment and employment also affects offending. The consequence of the simultaneity problem is that the identification of causal relationships is complicated. Valid instrumental variables are generally not available for individual-level studies and the sample sizes are too small to achieve identification from exogenous shocks. Instead, we take a time series approach and are mainly interested in whether current outcomes can predict future outcomes (Granger, 1980). This form of Granger-causality is reflected in Figure 1.1 by the fact that there are no arrows between the different adult outcomes within each adulthood period.

Next to the aforementioned problems of skills measurements, omitted variables and simultaneity, the individual-level setting presents a number of additional modeling difficulties that need to be addressed. First, the adult outcomes are typically non-linear, or non-Gaussian, in nature. For example, offending outcomes are often coded as binary variables, where the value one indicates that an offense is committed. Second, missing observations are common as many individuals are only partly observed. For example, incarceration spells cause individuals to temporarily lose their ability to make decisions during adulthood. These difficulties do not pose difficulties for translating the conceptual framework into an empirical framework, but they do make testing the empirical framework using econometric methods complicated.

This thesis translates the conceptual framework into an empirical framework while taking into account the translation difficulties. Such a theory-based modeling approach requires assumptions and we state these explicitly throughout the chapters. More discussion for the general modeling approach can be found in Keane (2010) and Wolpin (2013).

1.5 Data summary

1.5.1 17up study

In chapters two, three and four of this thesis we use data from the NSCR 17up study. This is a longitudinal study that follows disadvantaged youths into adulthood. The original 270 males and 270 females were all discharged from a juvenile treatment facility in the 1990s. We included all individuals who stayed in the institution for at least three months and were not being treated for sexual offending behavior⁴. Three main sources of data are used for the analyses: treatment files from the institution, official register data, and retrospective interview data for a subsample of the original group.

Treatment files

Measurements that are related to childhood skills are obtained from the individuals' treatment files. Permission for the use of the treatment files was obtained from the Department of Corrections (DJI). The files were obtained from the archive of the juvenile treatment facility. These files generally contained the results from psychological and psychiatric tests, advisory notes on extensions, and treatment evaluations. The reports in the files are in most cases prepared by forensic psychologists and psychiatrists. However, also external reports from the Dutch Child Protection Agency and other organizations responsible for the supervision of juveniles were found. For all individuals progress reports regarding their treatment had been compiled by a multi-disciplinary team.

Although the contents of the files varied between individuals, we were able to extract a large number of common items. These measurements are able to capture broad measures for both cognitive and social skills. In chapter two we use specific items from the files that capture personality traits, which can be seen as proxies for the cognitive and social skills. In chapter four we follow Heckman, Stixrud, and Urzúa (2006) and use a factor model to convert large vectors of measurements into low-dimensional factor scores for cognitive and social skills. Both approaches have their own benefits

⁴We excluded the sex offenders as there are reasons to believe that their behavioral problems and treatment are different from non-sexual offenders, see for example the meta-analysis of Seto and Lalumière (2010).

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and drawbacks. In particular, by selecting specific personality constructs the interpretation for the effects is simple. A drawback is that specific measurements are often contaminated with measurement error. The factor model approach that is adopted in chapter four circumvents this by using a factor model that incorporates measurement error. The drawback of the factor model approach is that the interpretation for the effects from the factor scores is less straightforward.

Official register data

In this thesis we make use of three kinds of register data. First, the offending and incarceration data are obtained from convictions registered in the Judicial Documentation (JD) abstracts of The Netherlands Ministry of Justice. Permission for the use of the criminal records was obtained from the Netherlands Ministry of Justice (JustID). These are comparable to rap sheets in the US. The abstracts contain information on every case that is sent to the Public Prosecutor's Office and the decision that follows on it. They also contain information on date and type of the offense. The abstracts are available for each individual from age 12 and onwards, 12 being the age of criminal responsibility.

We generally consider three categories for offending that include serious, property and violent offenses. The serious offenses are constructed following the definition given in Loeber, Farrington, and Washbush (1998) which includes all violent offenses, felony larceny, auto theft, burglary, breaking and entering, carjacking, forgery and counterfeiting, fraud, dealing in stolen property, embezzlement, drug trafficking, arson, weapons violations and firearms violations. The property offending category includes crimes such as embezzlement, theft, forgery and counterfeiting, breaking and entering, burglary, fraud and dealing in stolen property. The violent offending category includes assaults, threats, homicides, sexual offenses, robberies and kidnapping.

Second, we use official register data to construct the employment and social welfare outcomes. This is obtained between 2007 and 2009 from the Ministry of Social Affairs and Employment (SoZaWe). The information consists of individual-level employment and social welfare histories from 1992 onwards. For each employment spell we know the exact start and ending date of the contract. Whether a position was full-time or part-time remains unknown to us as we have no information on the exact amount of

hours spent working. Also, at the time of collecting the SoZaWe database contained no reliable information on wages.

We consider three different employment variables, which include spells that pertain to any type of employment, spells that pertain to regular employment and spells that pertain to employment via a temporary job agency. The latter distinction allow us to investigate the effect of job stability, since employment through a temporary job agency in the Netherlands often is seasonal or project based, and generally lasts for short spells of a few weeks to a few months providing little long-term prospects compared with regular jobs.

Additionally, we consider three forms of social welfare: unemployment insurance, disability insurance and public assistance. Unemployment insurance consists of payments for those who have lost their job, whereas disability insurance provides payments during illness. Insurance policies are temporary in nature. When individuals do not manage to find employment within the designated period or remain unable to work, public assistance is available to replace income. Public assistance, the most important welfare policy, is meant to assure recipients a minimum income needed for subsistence. Such benefits do not require proof of anything other than financial need, nor are they conditional on prior employment. More discussion for the requirements and details for social welfare are given in chapter three.

Third we use municipal registries to construct variables for marriage, divorce and the number of children. Permission for the use of municipal records was obtained from the Ministry of the Interior and Kingdom Relations (BZK). While our central focus is not on these variables we often include these variables as controls to limit their influence on the relationships among other adult outcomes variables.

Retrospective interview data

Face-to-face interviews were conducted with a subsample of the original 540 males and females. At the start of the interview phase in 2010, 22 of the original individuals had died, 14 had emigrated, 5 were living in institutions and another 19 could not be traced. The remaining 499 males and females were approached for interviews. Out of the 499 individuals 116 males and 132 females completed a full interview, after giving informed consent. Permission for the follow up study was given by the Department of

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Correction (DJI) and the ethics committee CERCOC of the VU University Amsterdam. A response analysis was conducted to verify the representativeness of the interviewed versus the original sample. Besides individuals without a regular place of living the subsample can be regarded as representative for the original sample. Further details for the interviews and the response analysis are given in van der Geest, Bijleveld, and Verbruggen (2013).

The interview consisted of two parts from which we obtained data. First, a structured questionnaire was filled in which covered a wide array of topics. For the purpose of this thesis we only used the questions related to education. The second part of the interview included filling in a life-history calendar. This tool aims to retrospectively reconstruct the life of the individual for a variety of adult life domains (Caspi, Moffitt, Thornton, & Freedman, 1996). For the purpose of this study we used the information related to drug use and intimate relationships.

1.5.2 TRANS-5 study

In chapter five of this dissertation we make use of data from the TRANS-5 study, see Bijleveld, Wijkman, and Stuifbergen (2007). The TRANS-5 dataset consists of observations for five generations of families (G1-G5). The five generations are ancestors and descendants of the original sample, which consists of 198 males who were institutionalized in a reform school between 1911 and 1914. While, the behavioral problems of these youths may not be identical to the behavioral problems of the youths from the 17-up study that were released from a juvenile treatment facility in the 1990s, they can both be regarded as disadvantaged youths, albeit in their own time period. The offspring of the G2 males and their spouses were traced in Dutch genealogical and municipal records, resulting in a 100% retrieval rate. Sample members of those G2 who had emigrated, or died before the age of 21, were considered lost to follow-up and their descendants were not traced. After removing these, 181 men remained who had offspring that is labeled G3; subsequent generations are labeled as G4 and G5.

In chapter five we rely on four generations, G2-G5, as criminal data for the G1 generation was available but was probably incomplete. In total, we included 4,120 individuals, to which an additional 1,919 spouses could be linked, resulting in 6,039 men and women. Each individual is included from age 12 to 60. Observations between

1920 and 2005 are included for generations G2 to G5.

1.6 Summary of the remainder

The remainder of this thesis is organized as follows. Chapter two examines to what extent cognitive and social skills that are formed during childhood and adolescence can explain the age-crime curve for disadvantaged youths. We propose a new decomposition model for explaining adolescent and adulthood offending, which incorporates a dynamic factor structure that captures age-varying payoffs from cognitive and social skills. We test whether personality traits can explain individual and age-varying differences in offending.

Chapter three tests economic and sociological theories for the relationship between employment and crime, where social welfare is used as an identifying mechanism. Childhood is treated as an unobserved period for which we statistically control. We simultaneously model the offending, employment and social welfare variables using a dynamic discrete choice model, where we allow for state dependence, reciprocal effects and time-varying unobserved heterogeneity. The chapter documents the interaction between offending, employment and social welfare during adulthood.

Chapter four combines the insights from chapters two and three and develops a complete framework that decomposes multiple adult outcomes into effects from childhood skills, signals and adult life transitions. We consider both cognitive and social skills, which may partially determine childhood signals for education and criminal records. Both the skills and the signals, are subsequently allowed to affect adult outcomes for offending, employment, social welfare, drug use and intimate relationships.

Chapter five provides a historical perspective for the relationship between unemployment and crime. We study to what extent the causal relationship between unemployment and crime has changed throughout the last century for families of disadvantaged youths.

Chapter six summarizes the main empirical findings and discusses the implications of the findings for criminological life course theories and public policy. We finish by discussing some directions for future research.