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by personal heterogeneity
and its effects on delinquency**

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DFG Research Center (SFB) “From Heterogeneities to Inequalities”

Whether fat or thin, male or female, young or old – people are different. Alongside their physical features, they also differ in terms of nationality and ethnicity; in their cultural preferences, lifestyles, attitudes, orientations, and philosophies; in their competencies, qualifications, and traits; and in their professions. But how do such heterogeneities lead to social inequalities? What are the social mechanisms that underlie this process? These are the questions pursued by the DFG Research Center (Sonderforschungsbereich (SFB)) “From Heterogeneities to Inequalities” at Bielefeld University, which was approved by the German Research Foundation (DFG) as “SFB 882” on May 25, 2011.

In the social sciences, research on inequality is dispersed across different research fields such as education, the labor market, equality, migration, health, or gender. One goal of the SFB is to integrate these fields, searching for common mechanisms in the emergence of inequality that can be compiled into a typology. More than fifty senior and junior researchers and the Bielefeld University Library are involved in the SFB. Along with sociologists, it brings together scholars from the Bielefeld University faculties of Business Administration and Economics, Educational Science, Health Science, and Law, as well as from the German Institute for Economic Research (DIW) in Berlin and the University of Erlangen-Nuremberg. In addition to carrying out research, the SFB is concerned to nurture new academic talent, and therefore provides doctoral training in its own integrated Research Training Group. A data infrastructure project has also been launched to archive, prepare, and disseminate the data gathered.

Research Project A2 “The Emergence and Development of Deviant and Delinquent Behavior over the Life Course and its Significance for Processes of Social Inequality”

The life-course approach can be used to study the emergence of deviant and delinquent behavior longitudinally from both psychological and sociological perspectives. This project focuses on the relationship between the development of these behaviors and the consolidation of social inequalities and social exclusion. The goal is to identify not only factors that facilitate processes of "dropout" from deviance and delinquency and promote "entry" into normal biographical life courses, but also factors that facilitate a long-term persistence of deviance and delinquency. The research project will apply a cohort sequence design that makes it possible to study the participants' development from preschool age until the fourth decade of life.

Disciplines: Sociology/Psychology

Research topics: Social inequality, longitudinal research, developmental research in psychology, and the sociology of crime

The Author

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Selection into criminogenic contexts by personal heterogeneity and its effects on delinquency

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Abstract

In a life course theoretical framework the mechanisms leading to inequality are differentiated into cumulative disadvantage and cumulative advantage (Ferraro, Shippee, & Schafer, 2009). This study focuses on the mechanisms accounting for a selection into criminogenic contexts addressed as cumulative disadvantage processes in the age graded theory of informal social control by Sampson and Laub (1993). Therefore it is examined whether the social bonds (to family, peers, and school) mediate the influence of propensity (low self-control) on delinquent behavior. The data analyzed comes from the first two waves of a German youth study from the project A2 called "chances and risks in the life course". In total 871 juveniles completed an anonymous self-report survey in the cities Dortmund and Nuremberg. The results of the structural equation model show at least moderate support for the theoretical assumptions.

Keywords: Life Course Theory, Cumulative Disadvantage, Age Graded Theory of Informal Social Control, Delinquency, Mediation

1 Introduction

The aim of this paper is to build a theoretical framework that accounts for both - factors that influences delinquent behavior as well as how criminal behavior affects the accumulation of disadvantage and inequality in the life-course. The presented framework contributes to the knowledge of the underlying mechanisms (Hedström & Ylikoski, 2010; Diewald & Faist, 2011) that produce population heterogeneity and cumulative disadvantages in the age span of adolescents. To develop the framework several theoretical approaches are combined: a life course perspective (G. H. Elder, 1985; Mayer, 2009), cumulative inequality theory (Ferraro et al., 2009), and the age graded theory of informal social control (Sampson & Laub, 1993). The life-course perspective often focuses on broad ranges like e.g. Sampson and Laub (2003) following the respondents from childhood up to the age of 70 years. This paper instead focuses on the time within adolescence. The current body of research is often limited to offender and/or male populations. It is further questionable whether prominent theoretical assumptions can be applied to the German context.

1.1 Life Course Theory and the Idea of Cumulative Disadvantage

After half a century of research the life course perspective including longitudinal analyses has "become the current gold standard of quantitative social science" (Mayer, 2009, p.414). Life course research identifies factors that address stability and change over the whole life span. A special advantage of the life course research is that it is able to address micro-, meso-, and macro-level factors and can thus bring structure and agency in a meaningful relation. Therefore "the outcome of personal characteristics and individual action as well as of cultural frames and institutional and structural conditions" (Mayer, 2009, p. 414) can be thoroughly analyzed in the

life course perspective. Consequently life courses research is able to examine individual transition and trajectories (c.f. Elder 1985) viewed in the context of different institutions (work, family) as well as in historical, socioeconomic or collective contexts (family, partnership, school). Life course sociology therefore allows to answer the question of how early life events, conditions, and mechanisms shape the life course and its outcomes in adulthood.

Since Merton's work on career trajectories (1968, 1988) and the Matthew effect¹ the research on cumulative (dis-)advantages has greatly increased. Examples are studies on mechanisms of the genesis of inequality DiPrete and Eirich (2006) as well as studies of crime causation (Sampson & Laub, 1997). Dannefer (2003) and O'Rand (1996, 2003) made an important contribution to the development of cumulative advantage/disadvantage theory focusing on growing heterogeneities in later life. "For a long time, the idea of cumulative advantage and disadvantage was not much more than a metaphor. This has changed to some degree by the work of DiPrete & Eirich (2006), who formally specified the underlying growth processes, and Ferraro and colleagues (2009), who make a strong argument for distinguishing between the mechanisms producing cumulative disadvantage and those producing cumulative advantage" (Mayer, 2009, p. 424).

Building on the work of Dannefer and O'Rand the cumulative inequality (CI) theory of Ferraro and colleagues (2009) states that disadvantages increase the exposure to risk, whereas advantage increases exposure to opportunity. „We define disadvantage as an unfavorable position in a status hierarchy due to structural determinants and/or behavior that reflects the past and the present circumstances of one's life. By contrast, we refer to risk as the probability of a hazard or negative event occurring in the future" (Ferraro et al., 2009, p. 422).

The aim of CI theory is to overcome shortcomings of the argumentation that "disadvantages lead to other disadvantages" (O'Rand & Hamil-Luker, 2005, p. 117) by identifying the mechanisms by which disadvantages accumulate. Therefore the authors differentiate a more detailed process of risk including the following steps: 1. risks increase the exposure to (other) risks, 2. an event occurs, 3. risks become disadvantages and 4. this disadvantages lead to more/other disadvantages. This 'chain' is useful to analyze inequality, because it permits to include concepts of agency (constrained by the structure of opportunities, see J. Elder Glen H., Johnson, & Crosnoe, 2003), to look at the onset as well as the duration of exposure (G. H. Elder & Shanahan, 2006), and additionally to account for trajectories and turning points (Sampson & Laub, 2003).

However, the aim of this paper is to go a step further in theorizing the processes leading from disadvantages to inequality including possible mechanisms that interrupt or strengthen the chain. The goal of the presented research is to highlight causal mechanisms of crime. The focus here is on the first part of the chain of risk. It asks how personal heterogeneity (risks or propensity) influences the selection of persons into criminogenic settings (which defines the persons exposure to risk) and if this in turn increases delinquency (further exposure/occurring event). The following assumptions are predominantly based on the age graded theory of informal social control by Sampson and Laub (1997, 2003). This is promising because it specifies processes of disadvantage accumulation in the context of delinquency.

1.2 The Age Graded Theory of Informal Social Control

Sampson and Laub presented their "Age-graded Theory of Informal Social Control" (AGT) in their book "Crime in the making: Pathways and turning points through life" (1993). Core assumptions are based on research of control and latent trait theory (mainly Hirschi, 1969, and Gottfredson & Hirschi, 1990) with which they share the supposition that weak or broken bonds to society and

¹The study by Blau and Duncan (1967) "The American Occupational Structure" is another example of an early and influential study in this field.

low self-control increase the likelihood of delinquent behavior. Although this theoretical basis is primarily static in nature, Sampson and Laub (1993) integrate this view into a dynamic framework accounting for both, stability and change in antisocial behavior. In terms of life-course theory, e.g. CI theory, they postulate that the accumulation of disadvantage is by no means deterministic. Studies of crime causation show consequently that past behavior is the best predictor for future behavior (Moffitt, 1993, Nagin and Paternoster 1991). To explain this continuity, Nagin and Paternoster (1991) propose two processes to account for this correlation: population heterogeneity and state dependence.

The first one, population heterogeneity, refers to “individual differences in the underlying propensity to commit delinquent and criminal acts” (Mason & Windle, 2002, p. 480). The term “criminal propensity” was first introduced by Wilson and Herrnstein (1985) and describes a latent and permanent individual characteristic. As such, it is an appropriate measure of heterogeneity in studies that examine mechanisms leading to disadvantages and inequalities (Diewald & Faist, 2011). A similar definition of criminal propensity can be found in Gottfredson’s and Hirschi’s work: a person with a criminal propensity has a lack of self-control, which means that they “tend to be impulsive, insensitive, physical (as opposed to mental), risk-taking, shortsighted, and nonverbal, and they therefore tend to engage in criminal and analogous acts” (p. 90).² A committed crime satisfies the person’s short-term benefits without a consideration of its long-term consequences. From this point of view stability of low self-control is interpreted as a personality trait that causes crime over the whole life span (see Sampson and Laub 1997, p. 5). Although Sampson and Laub build a large part of their theoretical assumptions on the work of Gottfredson and Hirschi, they restrict the general theory of crime (GTOC) in many points (such as the assumption that the development of self-control is not fixed after childhood). Sampson and Laub (1993) accept the propositions of criminal propensity or population heterogeneity (for a review of the discussion about self-control see Burt, Sweeten, & Simons, 2014). Furthermore AGT argues that early stages in life influence later life outcomes. Consistent with assumptions of Hirschi (1969) they argue that early antisocial behavior results in weak or broken social bonds (including the informal social controls related to them) during later life stages. Persistent antisocial or delinquent behavior therefore is a consequence of missing social bonds linking adolescents to conventional society.

The second process that plays an important role in relating past to present and future behavior is state dependence or cumulative disadvantage, also known as “knifing off” from future opportunities (Caspi & Moffitt, 1993) for a conventional life course.³ A major argument in the work of Sampson and Laub is that the age-related changes in social bonds from adolescence (e.g. to family, peers, and school) to adulthood (e.g. to partners, colleagues, comrades⁴) explain delinquent trajectories regardless of prior differences in (early childhood) criminal propensity. They contend that early childhood traits, e.g. low self-control, “are mediated in developmental pathways by key age-graded institutions of informal and formal social control” (Sampson & Laub, 1997, p. 10). A combination of population heterogeneity and state dependence describes static and dynamic processes in a detailed way (Mason & Windle, 2002). Population heterogeneity explains the persistent direct effects of past to present behavior, mediated by informal social control.

Besides direct effects and mediation processes Sampson and Laub consider a moderation effect of social bonds on the influence of self-control on delinquency. The advantage of a life-course perspective is that it acknowledges individuals being able to change through interactions as they

²According to GTOC self-control is acquired up to the age of 8 – 10 and afterward tends to persist after the formative years without any influences of parents or other social institutions (c.f. Gottfredson & Hirschi, 1990, p. 107f.).

³Differential association or learning theories (Akers, 1973; Sutherland & Cressey, 1960) and labeling theory (Lemert, 1972) address this issue in a similar manner.

⁴The focus on military service is due to the birth cohort of the data base. Sampson and Laub (1993, Laub & Sampson, 2003) conducted a reanalysis of the data set collected by Glueck and Glueck (1950) starting in 1939.

age (Sampson & Laub, 1992, p. 81). This is due to the premise that adult social bonds moderate effects of criminal propensity like marriage or job ties that reduce opportunities and increase the costs of delinquent behavior (Sampson & Laub, 1993, p. 143). “Accordingly, individuals with low self-control should be restrained by bonds with conventional society, and be less likely to engage in criminal behavior than individuals with low self-control who lack such ties” (Schulz, 2014, p. 15). This paper analyzes direct (and mediation) effects and is therefore a first step to find potential moderators for future analyses within the age span of adolescence.

1.3 Hypotheses

As Hirschi stated already in 1969, delinquency is more likely when an individual’s bond to society is weak or broken: “If the bond to the parent is weakened, the probability of delinquent behavior increases, if this bond is strengthened, the probability of delinquent behavior decreases” (Hirschi, 1969, p. 88). Previous research has shown that family context and socialization conditions have substantial influence for explaining deviant and delinquent behavior (see Loeber & Stouthamer-Loeber, 1986). Much of the research, however, has viewed the setting of the family as static, meaning that parenting practices flow from parents to child, thus ignoring that socialization and family bonding is a reciprocal interaction. This takes into account that attachment functions as an indirect control, based on the argument that emotional bonds to parents increase the influence of their normative expectations and in turn makes it more likely to resist delinquent temptations (c.f. Akers, 1999, p. 231). “In this case, youths’ conformity is achieved as a by-product of their attachments to parents and not as the result of specific attempts to discipline them. As a result, the quality of attachment functions as an indirect parental control” (Burton Jr. et al., 1995, p. 112).⁵

As family, school is an important socializing context. Schools can exert social control because they are able to effectively monitor behaviors thus recognizing deviant behaviors and having the authority to punish deviations from norms and lapses in self-control (Sampson & Laub, 1993, p. 101). Similar to control theory (Hirschi 1969) it is assumed that weak attachments to school lead to a lack of commitment to educational and occupational goals and consequently decreases school attainment. This results in turn in a heightened risk for delinquent behaviors (see also Cernkovich & Giordano, 1992 for competing theoretical foundations).

Whereas strong attachment to family and school is a potential barrier, deviant peers are regarded as a potential instigator for delinquent behavior (Hirschi, 1969; Sampson & Laub, 1993; Warr, 1993). It is hypothesized that juveniles with a low self-control are more prone to delinquent friends and therefore select themselves in a context in which they are more exposed to crime. This selection effect is often described as “birds of a feather flock together” (c.f. Glueck & Glueck, 1950).

Additionally, a variety of structural background variables are taken into account in AGT (c.f. Sampson & Laub, 1993, p. 66), of which only a selection can be applied in this study. In this paper migration background and socioeconomic status are considered as in AGT but additionally age and gender are also taken into account.⁶ Gender is a missing aspect in AGT because the data base of their research is limited to males. It is known from previous research that, besides the varying numbers of committed offenses by sex, the mechanisms related to the explanation of involvement in delinquent behaviors differ for boys and girls in some aspects (see Giordano,

⁵In contrast to indirect controls, direct controls are immediate punishments of deviations of norms or rules to limit or sanction misbehavior (c.f. Rankin & Wells, 1990, p. 141).

⁶Age is relevant as a control variable, primarily in relation to school attainment. Adolescents who are older than their classmates age are probably repeating a school year and the likelihood of delinquent behavior may already be decreased for older juveniles. For a general overview of the age crime curve see Sampson and Laub (2003, p. 565f.), for the German context see Boers and Walburg (2007).

Cernkovich, & Rudolph, 2002; Mason & Windle, 2002; Seus & Prein, 2004; South & Messner, 2000). Migration background is included because there are enormous racial differences in the US. "Namely, there is increasing evidence that the probability of adolescent risks becoming transmuted into adverse adult circumstances is greatest among those in disadvantaged racial and economic positions" (Sampson & Laub, 1997, p. 22f.). Socioeconomic background is assumed to be a structural disadvantage decreasing the capacity of a family to realize effective social control (Sampson & Laub, 1994, p. 523f.).

To conclude, the following hypotheses can be extracted from the theoretical framework:

Hypothesis 1: Low self-control, low attachment to parents, low school attainment, and deviant peers have significant effects on delinquency.

Hypothesis 2: Low self-control has significant effects on attachment to parents, attainment in school, and deviant peers. Hypothesis 3: The effects of low self-control on delinquency are mediated by the level of attachment to parents, the level of school attainment, and the existence of deviant peers.

Hypothesis 4: The heterogeneity variables age, migration background and socioeconomic status have only weak significant effects on crime.

Hypothesis 5: Gender has significant effects on delinquent behavior.

Hypothesis 6: The effects of the heterogeneity variables (gender, social status and migration background) on delinquency are mediated by low self-control and/or attachment to parents, school attainment, and deviant peers.

This paper investigates which ascriptive heterogeneity features influence criminal propensity. Furthermore it reveals if propensity (low self-control) influences the selection into criminogenic settings. Thus, the aim is to describe mechanisms of cumulative disadvantage. It is also examined how mechanisms of state dependence and population heterogeneity impact crime causation. Two time points within the age span of adolescence are required, because adolescence is a highly developmental stage of maturation. The resulting partial mediation model offers the potential to name moderators for future analyses. Influences of important social control instances in adolescence thus are specified. Having in mind the question which social control institutions influence stability and change at the end of adolescence Sampson and Laub state that the influences of social bonds change during the life course. Therefore the question raised here is, whether social bonds to family, peers, and school mediate the influence of propensity (low self-control) on delinquency and/or if social bonds directly influence crime at the end of adolescence. Moreover, direct and indirect influences of heterogeneities (age, gender, SES, and migration background) on variables of social control and delinquency are taken into account. Furthermore, this study will add to research on the relation between migration background and crime which has so far produced diverging results on this issue. Structural equation modeling offers the opportunity to account for mediation effects which are often ignored, but theoretically explicated by the AGT.

1.4 State of Research

In a Meta-Analysis of the GTOC (Gottfredson and Hirschi 1990) Pratt and Cullen (2000) reveal that the Grasmick scale (Grasmick, Tittle, Bursik Jr., & Arneklev, 1993) is "perhaps the most carefully designed and valid measure of self-control" (Pratt & Cullen, 2000, p. 943). Besides the measurement of self-control with the Grasmick-scale the effect sizes find that self-control in general is "one of the strongest known correlates of crime" (Pratt & Cullen, 2000, p. 952). Newer results from the "Family and Community Health Study" of Burt and colleagues (2014) support this claim in general but argue against other basic assumptions of Gottfredson and Hirschi (1990), e.g., the stability hypothesis.

Focusing on the hypothesis that attachment reduces crime, a survey focusing on high school students attending grades 10 to 12 Burton and colleagues (1995) have not found substantial influences of indirect controls (e.g. affective bonds), but for direct controls (e.g. discipline and punishments). Elliott, Huizinga, and Ageton (1985) conclude that the association with delinquent peers is a very strong predictor for criminal acts. For a German youth sample a strong direct influence of having deviant peers (for 5th and 9th graders) and a moderate influence of school attachment (for 5th graders) could be revealed (Reinecke, Stemmler, Arnis, et al., 2013). Sampson's and Laub's results reanalyzing the Glueck's data showed direct effects of informal social control processes from family, peers, and school contexts even when controlling for early child effects (Sampson & Laub 1993, p. 121, for a more detailed overview and another empirical study of self-control, social control variables and delinquent behavior see Mason and Windle 2002, p. 488f.).

Using a German longitudinal study conducted in Bremen, Seus and Prein (2004) confirm the widespread knowledge (see South and Messner 2000) that men are more likely than women to commit crimes. In another German study ("Crime in the modern City - CRIMOC") the peak of self-reported delinquent behavior was found to happen between the ages 14 and 16 whereby males range on a higher crime level but with parallel age developments for both sexes (Boers & Walburg, 2007, p. 86f.). Data from the same study revealed that migration background had no influences when controlling for educational deprivation (Walburg, 2007, p. 264.). Naplava (2003) compared several German surveys resulting in a general support for this finding by Walburg (2007) but found differences in the types of offenses and for different ethnic groups.

In summary, there are only few or mixed results for the influences of heterogeneities (especially for migration background and the socioeconomic status of parents) on social bonds, criminal propensity and delinquent behavior. The direct influences of social bonds and criminal propensity, and for the mediator effects of social bonds on delinquent behavior is more or less supported by past research. However, it remains unclear if the results are transferable to the German context. The question is especially whether low self-control increases the risk of being prone to a criminogenic context (e.g. more deviant peers, less school attainment and less bonding to parents) and if this in turn increases the likelihood of delinquency. In the following analyzes potential moderators for future analyzes will be determined. Moreover, the following analyzes are not limited to males.

2 Methods

2.1 The Study "Chances and Risks in the Life Course" (Sample and Data)

The data used in this paper comes from the study "Chances and Risks in the Life-Course". Initial surveys of the panel study were conducted in 2012 in Dortmund and Nuremberg, Germany. Instead of using official justice data or data from offender populations this study is an anonymous general adolescent population self-report survey. It follows a cohort sequential design with yearly follow-ups. The first wave started with two cohorts aged around 11 and 15. Currently two panel waves are available. Hence, only a brief description of the design is presented here. A full description of the study is given by Reinecke, Stemmler, Sünkel, et al. (2013). For the technical reports see Meinert and Sünkel (2013), Schepers and Kucur-Uysal (2014) and Meyer and Schepers (2014), and Meinert, Kaiser, and Guzy (2014). Panel data of both existing waves from the older age cohort is used. The measurement of self-control collected in wave one and the delinquency measure from time point two, to account for the causal mechanism of self-control on delinquency. A total number of 871 juveniles participated in the survey. The retention rate across the first two waves is about 59% (Meyer & Schepers, 2014, p. 13f). In the first wave the juveniles had an average age of 15 with a range of 13 to 18. Logically, and due to yearly follow-ups of the study, the mean

age in the second wave was 16 (with a range from 14 to 21).

2.2 Measurements and Descriptives

2.2.1 Dependent Variable: Delinquency

Participants were asked if they engaged in one or several of 19 different offenses. The delinquency scale includes a variety of minor and major delinquent behaviors and was built using the measurements of the second time point. The items used in the questionnaire are drawn from established German crime surveys (Boers & Reinecke, 2007; Lösel, 1975). Forms of property crime (e.g. theft, handling of stolen goods), violent crimes (e.g. aggravated assault), and damage to property crimes (e.g. graffiti, vandalism) are included. The incidence as well as the prevalence of delinquency in the past year are measured for every offense. The dependent variable used prevalences, measured with a dummy variable, where 0 indicates no delinquent acts in the last year and 1 indicates the participation in at least one delinquent act in the past year. The summed up dummy variables for each participant resulted in a delinquency index with a number of 19 offenses as upper limit. 802 valid cases could be used to construct the delinquency index. Despite a theoretically possible maximum range of 19 different committed offenses the maximum was 13 (c.f. Table 1). In total there are 22.8 % offenders in the sample (for the descriptives c.f. Table 1). The coefficient alpha for the delinquency index is 0.77.

Table 1: *Measurement & summary statistics*

Variable	Mean	Std. Dev.	Min.	Max.	N
Delinquency-Index	0.53	1.41	0	13	802
Age	15.10	0.828	13	18	866
Gender (0=male)	0.55	0.498	0	1	863
Migration background (0=no mig.b.)	0.569	0.495	0	1	850
Socioeconomic status (1=poor)	6.222	1.332	1	10	830
Risk seeking 1 (= not at all) to 5 (= absolutely):					
I like to test myself every now and then by doing something a little risky	2.252	1.21	1	5	860
Sometimes I will take a risk just for the fun of it	2.341	1.199	1	5	866
I sometimes find it exciting to do things for which I might get in trouble	2.529	1.232	1	5	866
Excitement and adventure are more important to me than security	2.259	1.102	1	5	865
Attachment 1 (= not at all) to 5 (= absolutely):					
My parents accept me the way I am	4.423	0.950	1	5	862
My parents understand me	3.841	1.136	1	5	862
I trust my parents	4.439	0.963	1	5	861
Attainment-Index	4.114	0.705	1	5.5	781
Deviant peer-Index	1.558	0.666	1	4.75	860

2.2.2 Independent Variables

Self-control: risk seeking

Self-control is measured with the classic Grasmick Scale (Grasmick et al., 1993) which consists of

six different dimensions. Due to space limitations in the questionnaire not all dimensions of the scale are measured. But as Arneklev, Grasmick, Tittle, and Bursik Jr. (1993) revealed, risk seeking has more predictive power than the overall scale. Hence it is sufficient to concentrate on one dimension for the purpose of this article. Four items of the dimension risk seeking are taken into account, for example “I like to test myself every now and then by doing something a little risky” (a full description of the used items is presented in Table 1). All items of the scale are measured on a 5 point likert scale. The three items from the first wave resulted in a reliability coefficient of 0.87. Construct validity was proven by a confirmatory factor model (Muthén & Muthén, 1998-2012).⁷ Factor loadings varied between 0.664 and 0.814.⁸

Deviant Peers

Deviant peers is also measured on a 5 point likert scale. The respondents should assess how often their friends committ various offences. The question was “How often do you think your friends act as follows:...”. The question was based on the peer crime involvement scale of the “Peterborough Adolescent and Young Adult Development Study (PADS+)” by Wikström, Oberwittler, Treiber, and Hardie (2012). However, specific offenses of the item set are taken from the CRIMOC-project by Boers and Reinecke (2007). Because the question has a more formative than a reflective character no confirmatory factor was used here. Instead, items of the second time point are summed up to an index “deviant peers” which consists of the following offenses: steel something from a store worth 15 euros, i.e. a cd; attack somebody and punch someone in his/her face; take drugs; and extort money from others. Cronbachs alpha for the deviant peers scale was 0.681.

Attachment to Parents: Trust

The items used to assess the attachment to parents were obtained from the “Inventory of Parent and Peer Attachment” (IPPA) by Armsden and Greenberg (1987). Three items taken from a subdimension were chosen to measure the factor trust (items used are presented in Table 1). The reliability coefficient for this scale was 0.802. For this scale a latent variable was constructed with variables of the second wave. Facotr loadings are between 0.708 and 0.821.

Attainment in school

To measure attainment in school three variables are used. The respondents were asked “How important are good school grades to you?”, “What is the highest school degree you want to achieve?” and “What was the grade average of your last school report?”. Therefore the three items cover actual attainment, future educational aspirations and commitment. The reliability coefficient for the attainment scale is 0.436.

Heterogeneity variables: age, gender, migration background and socioeconomic status

All background variables were measured at time point 1. The respondents were 16 years on average, about 55% were female and about 57% had a migration background (see Table 1). The definition of migration background follows the one used by the federal office, whereafter a person “has a migration background if he/she is foreign born or, born as foreigner in Germany or, if at least one parent is foreign born or born as a foreigner in Germany” (Statistisches Bundesamt, 2013, p. 6). Socioeconomic status is measured with a self-assessment of the family’s financial prosperity in comparison to others.

⁷The two-step procedure recommended by Schumacker and Lomax (1996) was followed by testing the measurement model before the structural model.

⁸In the measurement model self-control and attachment to parents was tested to test if the constructs are applicable for German juveniles. The results of the confirmatory factor analysis showed an adequate fit (Estimator=MLR, N=871, $\chi^2=21.78$, $df=13$, $p=.059$, $RMSEA=.028$, $CFI=.995$, $SRMR=.021$).

3 Results

Structural equation modeling (Reinecke, 2014) is used to analyze the theoretical assumptions. Following the recommendation of Schumacker and Lomax (1996) to test the measurement model first and then the possible structural models (for the results see the measurement and description section). Robust maximum likelihood (MLR) estimation was used to account for the non-normality of the data. The analyzes were conducted with Mplus 7.1 (Muthén & Muthén, 1998-2012) considering missing values with full information maximum likelihood (FIML).⁹ The proposed

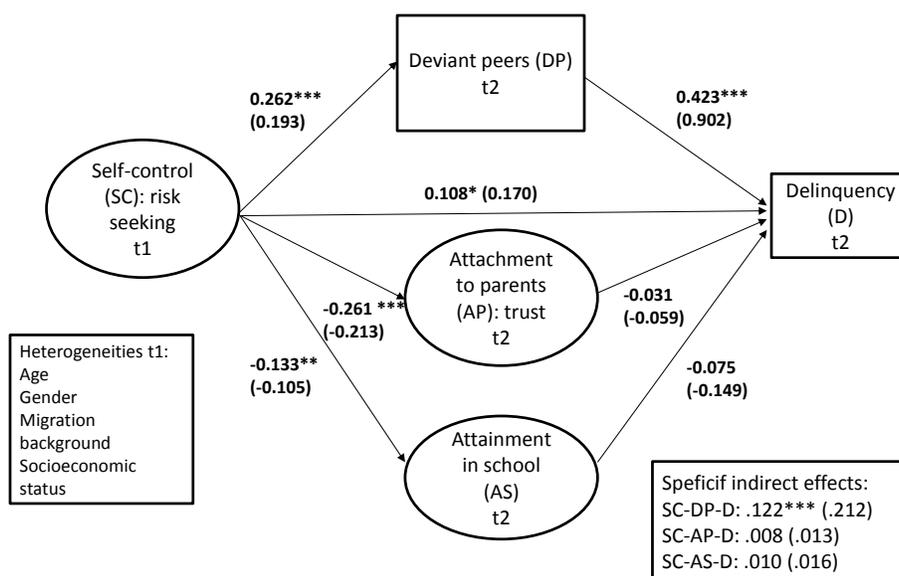


Figure 1: Results of the structural equation model (unstandardized coefficients in brackets, effects of heterogeneity variables not displayed)

partial mediation model fit the data well ($N=811$, $\chi^2=76.417$, $df=51$, $p=.012$, $RMSEA=.025$, $CFI=.988$, $SRMR=.023$). According to Baron and Kenny (1986) the path from the mediator to the dependent variable has to be significant to show a mediation effect. As can be seen in Figure 1¹⁰ attainment to school (β $-.075$, $p >.05$) and attachment to parents (β $-.031$, $p >.05$) show the expected negative directions but are not significantly influencing delinquency. The only potential mediator remaining is therefore the influence of deviant peers. The results show that having deviant peers ($\beta=.423$, $p <.001$) is a highly significant predictor of delinquency. Not to be assumed to be a mediator, but significantly influencing delinquent behavior is high risk seeking measured at time point 1 ($\beta=.108$, $p <.05$). Hypotheses 2 presumes a direct effect of low self-control (here high risk seeking) on all the bonding variables (family, peers and school). Consistent with this hypothesis juveniles who are high on risk seeking are significantly more prone to deviant peers ($\beta=.262$, $p <.001$), have less trust

⁹For a test of the performance of FIML see Enders and Bandalos (2001).

¹⁰The indirect and direct effects of the heterogeneity variables are excluded in Figure 1 to get a clearer visualisation of the model. This results are displayed in Table 2.

in their parents ($\beta=-.261$, $p <.0001$) and a lower school attainment ($\beta=-.133$, $p <.01$). Bias-corrected bootstrapping was conducted while testing mediation effects to control for the imbalance of confidence limits (MacKinnon, Lockwood, & Williams, 2004) but no diverging outcomes could be detected. As expected in hypothesis 3 deviant peers mediate the influence of risk seeking on delinquent behavior (specific indirect effect of $\beta=.111$, $p <.001$). The effects of attachment and attainment adopted in hypothesis 1 and 3, however, were not confirmed. Contrary to hypothesis 4 the effects of the heterogeneity variables age ($\beta=-.003$, $p >.05$), migration background ($\beta=-.020$, $p >.05$) and financial status ($\beta=.053$, $p >.05$) had no significant influences. As stated in hypothesis 5 gender has a highly significant influence on crime ($\beta=-.106$, $p <.001$), meaning that boys are more likely to show delinquent behavior. Boys ($\beta=-.110$, $p <.01$) and persons with a migration background ($\beta=.077$, $p <.05$) are more prone to delinquent peers. The educational attainment is higher among younger respondents ($\beta=-.188$, $p <.001$), among respondents with a higher socioeconomic status ($\beta=.084$, $p <.05$), and among females ($\beta=.084$, $p <.05$). Migration background, however, had neither an effect on school attainment nor on attachment to parents. The latter is however significantly influenced by gender ($\beta=-.092$, $p <.05$) and financial situation ($\beta=.114$, $p <.01$). In contrast to hypothesis 6, the total indirect effects of age and socioeconomic status were not significant (see for Table 2). In line with this hypothesis the results showed significant total indirect effects for gender ($\beta=-.100$, $p <.091$) and migration background ($\beta=.040$, $p <.05$).

Table 2: (Significant) standardized total & specific indirect effects

Variables	β	p-value
total indirect effects		
SC \rightarrow D	.129	.000
Age \rightarrow D	.031	.125
Gender \rightarrow D	-.100	.000
Mig. back. \rightarrow D	.040	.018
SES \rightarrow D	-.015	.409
specific indirect effects (only sig.)		
SC \rightarrow DP \rightarrow D	.111	.000
Gender \rightarrow DP \rightarrow D	-.046	.006
Gender \rightarrow SC \rightarrow D	-.023	.035
Gender \rightarrow SC \rightarrow DP \rightarrow D	-.024	.000
Mig. back. \rightarrow DP \rightarrow D	.033	0.22

Note: SC=Self-control; D=Delinquency; SES=Socioeconomic background; DP=Deviant peers.

4 Discussion

The main purpose of this article is to analyze how self-control influences the selection of German adolescents into contexts which expose them to crime. Deviant peers, trust to parents and attainment were taken into account as social control instances that influence delinquent behavior. It was hypothesized that these control instances, besides their direct influences, act as mediators in the relationship of risk seeking and delinquency. This study took several heterogeneity variables into account and examined their potential influences on the mediators. Therefore two waves of the study ‘chances and risks in the life course’ of male and female respondents are analyzed. First of

all it should be mentioned that a closer look on the time span within adolescence is considered to be most valuable, because this is a highly developmental phase during maturation. Therefore this age-span is highly relevant for processes of change and stability in delinquency. It is well known that desistance from crime starts at the end of adolescence. The results of this article can therefore gain insights relevant for future desistance research. The results reveal that the criminogenic context of German juveniles aged around 15 and 16 is primarily characterized by peer context. This result confirms findings of Elliott et al. (1985). In the presented models family and school context do not have a major impact on delinquency. Sampson and Laub (2003) consider that influences of parental and school attachment decrease in the transition to young adulthood. Therefore the results presented here suggest that this processes starts earlier than expected by Sampson and Laub (1993) which define the starting point for young adulthood at age 17. This might be due to differences in the German school system where some pupils leave (secondary) school in the age of 15 after the 9th grade. Another possibility is that there were no influences of the family context because only indirect controls were considered (see also Larzelere & Patterson, 1990). Maybe monitoring or supervision play a greater role at the end of adolescence as found in the study of Burton and associates (1995). Presumably, the adolescents are in a period of separation from parental home where influential informal controls gradually change to other non-parental controls (for example in job or partnership relations). Because there is a time between school and work or marriage future research is needed to specify which social bonds are influential in this age span. Therefore it is relevant to consider the national context because of different school systems. In line with hypothesis 5 a significant influence of gender has been found in this as well as in many other studies (e.g. Giordano et al., 2002; Mason & Windle, 2002; Nofziger, 2010). This suggests that influences tend to differ between genders. Further research on the age span of adolescence and especially on young adulthood is needed, because the hypotheses generated in former research tend to focus on males in the US context (see Sampson and Laub 2003).¹¹ In contrast to the last hypothesis age and socioeconomic status neither have direct nor indirect effects. For age this could be due to the narrow age-span in the model. Why the migration background was mediated through deviant peers has to be subject to further analyses. In general this result confirmed the findings of Walburg (2007), where no direct effects of migration background on delinquency are found.

There are some limitations, which may affect the generalizability of this study. First of all, 'only' two time points were available so far. Therefore effects of peers, attachment to parents, and in school attainment were measured at the same time point as delinquency, whereby delinquency was measured retrospectively. After all, the influence of self-control was measured before the delinquent act happened and before the adolescents 'selected' themselves into criminogenic contexts. Additionally longitudinal analyses with three or more time points would allow tests on stability and change which could only be partly considered here.

With the availability of the three wave panel data of this study (in early 2015), the next step is to analyze state dependence as well as the dimensionality of self-control and its influences on criminal trajectories. Burt and colleagues (2014, p.458) summarized their findings suggesting that the dimensions risk seeking and impulsivity do not develop in a parallel manner. Furthermore, the results presented in this paper reveal that juveniles with low self-control are more prone to deviant peers and therefore accumulate exposure to other risks (in this case delinquency). Deviant peers are moreover possible moderators in the relationship between self-control and delinquency. Sampson and Laub (1993) propose that self-control could act as a moderator, but one could equally well consider social bonds to be moderators considering the 'chain of risk' to be reciprocal. The

¹¹The cohort of the Gluecks' data should differ in many respects to more recent cohorts like gender roles, typical age spans to start family, importance of marriage, etc.

findings suggest that self-control is not as stable as assumed by GTOC (Burt et al., 2014).

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