



Criminal Careers of Individuals Convicted for a Sexual Offence: an International Comparison

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Abstract

By comparing criminal careers of individuals who have sexually offended to those who have not sexually offended, the current study examines whether their criminal career parameters and trajectories differ. National conviction records (entire criminal history and about 18 years of follow-up after index offence) from Belgium and the Netherlands are used to describe and compare the criminal careers of individuals involved in sexual or non-sexual offending. Group-based trajectory models are estimated for each offender class per country. The results show no substantive differences between individuals convicted for sexual offences and individuals convicted for non-sexual offences on age of onset and termination, duration, frequency, and crime mix. Group-based trajectory modeling results in a four-group model with a low-level offending ($\pm 65\%$), late onset offending ($\pm 12.5\%$), adolescent and young adult offending ($\pm 17.5\%$), and persistent offending ($\pm 5\%$) group. Trajectory patterns are similar across offender class and between countries. ANOVA comparisons between trajectory groups show few differences in criminal career parameters and many similarities. Only small differences could be established between criminal careers of persons convicted for sexual offences and those convicted for non-sexual offences. This leads us to question assumptions about persons convicted for sexual offences as offenders with unique trajectories.

Keywords Sex offence · Criminal career · Offending trajectory · International comparison

Introduction

Public and policy ideas about individuals who commit sexual offences are based on stereotypes about these persons and their offending behavior, including the idea that they will continue to commit sexual offences over and over again (e.g. Ackerman and Burns, 2016; Robert, 2021). Individuals who commit sexual offences are often found to also

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engage in non-sexual offending (Lussier and Blokland, 2018). Having a history of non-sexual crime is common in samples convicted of a sexual offence, while recidivism studies usually find that when a sex offence is committed the likelihood of a subsequent non-sexual offence tends to surpass that of a subsequent sexual offence (Hanson and Morton-Bourgon, 2005). Rather than “specialised”, sexual offending therefore typically seems embedded in a more encompassing pattern of antisocial behavior (Spaan et al., 2020). The frequent comorbidity of sexual and non-sexual offending however does not preclude considerable variation in the extent to which those committing sexual crimes are also engaged in non-sexual crimes. Despite the gravity of their offence, not all who commit a sexual offence are high-risk, prolific offenders. While engagement in non-sexual crime appears common, the extent of this engagement may show considerable variation.

Following research on general offending (Blumstein, 2016; Piquero et al., 2003), research on sexual offending has increasingly embraced a longitudinal criminal career approach to examine both between and within individual differences in offending behavior over time (Blokland, 2018; Blokland and Lussier, 2015b). This paradigm shift is changing the way the criminal behavior of individuals who have sexually offended is being studied. Thus far, however, many of these studies have focused on isolated features of the non-sexual offending behaviour, e.g. the presence and extent of a criminal record (e.g. Francis et al., 2014), or have examined only part of the criminal career, e.g. examining recidivism following a sexual offence (e.g. Jennings et al., 2012), obscuring the overall patterning of offending in this population over time. As a result, though there is consensus that when it comes to committing non-sexual crimes individuals who commit sexual offences constitute a heterogeneous group (e.g. Lussier and Davies, 2011; McCuish et al., 2016), the exact nature of this heterogeneity, as well as how this heterogeneity compares to that found in general offending samples, is far less clear.

As for offending behavior in general, mainstream criminologists have benefited from methodological advances allowing them to take a more holistic, person-centred perspective and distinguish between groups of individuals based on specific combinations of key criminal career features rather than examining different features of criminal behavior (e.g. onset, timing, frequency, and desistance) in isolation. In a review of studies that used quantitative methods to distinguish groups of offenders based on the overall course of their criminal career, Van Dulmen and colleagues identified 59 studies (Van Dulmen et al., 2009). Another review found over 80 studies (Piquero, 2008), while a few years later, Jennings and Reingle (2012) retrieved no less than 105 studies that used trajectory analysis. This exponential increase in studies shows that group-based models have been warmly welcomed in the criminologist’s methodological toolbox. These reviews find trajectory studies to differ widely in the samples used, the outcome of interest, and the length and timing in the life-course of the period under scrutiny. Still, they allow for drawing some summary conclusions on the number, shape, and distribution of trajectories found in general offending samples.

Studies based on measures of officially recorded offending (e.g. arrests, charges, and convictions) tend to have longer follow-ups than studies based on self-report measures. Studies based on officially recorded offending typically distinguish three

or four developmental trajectories (Jennings and Reingle, 2012). Whereas theory-laden labels applied to the trajectories distinguished are used rather loosely, and as a result similarly labelled trajectories may refer to rather different empirical observations, most studies identify a large group of individuals only incidentally, if at all, involved in crime. Additionally, they typically also identify a group whose trajectory follows the overall age-crime curve and whose offending peaks during the late teens and early twenties after which it gradually declines, and a typically small group of individuals who, compared to the other groups, show high rates of offending from an early age onward and who continue to do so for a consecutive period of time. Differently shaped trajectories, like one in which offending does not begin to rise until individuals are in their adult years, have been identified in some samples (e.g. Matsuda et al., 2022; Van Koppen et al., 2014) but in a less consistent manner.

Given indications that individuals who offend sexually are involved in non-sexual crimes but to varying extents, the question arises whether the patterning of offending found in those who offend non-sexually equally applies to those who offend sexually or whether persons who sexually offend represent a separate category altogether (Blokland, 2018). Using nationwide registration data from Belgium and the Netherlands, this study therefore addresses two research questions:

- 1) How do criminal career parameters differ between individuals committing sexual and non-sexual offences in Belgium and the Netherlands?
- 2) Using a group-based trajectory modeling approach (GBTM), which criminal trajectories (number of groups and shapes) can be identified among individuals committing both sexual and non-sexual offences in these countries?

The remainder of this article is organised as follows. First, we review published studies that have used a person-centred approach to distinguish criminal trajectories among those committing sexual offences, identifying the strengths and weaknesses of prior research in the process. Next, we describe how the current analysis attempt to address some of these weaknesses and provide a description of the datasets used. We then present our results per offender group and by country allowing for both within- and between-country comparisons. We conclude with discussing the theoretical and policy ramifications of our findings.

Person-Centred Approaches to the Patterning of Offending in Those Who Sexually Offend

In terms of the application of person-centred approaches to the patterning of offending in those who sexually offend, we conducted a literature search in Web of Science, SCOPUS, and Google Scholar using combinations of the following search terms: group based mod*, group-based traject*, finite mixture mod*, group based semi parametric traject*, growth mixture mod*, latent growth model, GBTM, trajectory*, and sex offend*. Fifteen publications were retrieved that use GBTM to

Table 1 GBTM applied to persons with sexual offending, sorted by year of first publication data set

Authors	Country	Outcome	Sample	(Average) follow-up period for GBTM	Sample size	# Trajectories per GBTM
Lussier et al., 2010	Canada (Québec)	Convictions (self-reported for age 12–18)	Adults admitted to a federal penitentiary in Québec for a sex offense, aged 35 or older	17 years (age 18 to 35)	250	4 Very low rate (68.8%); Low-rate desisters (31.2%); Late-bloomers (12.7%); High-rate chronics (9.3%)
Lussier & Davies, 2011	Canada (Québec)	Charges	Adults admitted to a federal penitentiary in Québec for a sex offense, aged 35 or older	17 years (age 18 to 35)	246	GBTM1 (violent only): 2 T1 (80.1%); T2 (19.9%) GBTM2 (sexual only): 2 T1 (96.3%); T2 (3.7%) GBTM3 (violent and sexual): 3 T1 (61.0%); T2 (31.7%); T3 (7.3%)
Tewksbury & Jennings, 2010	USA (IA)	Convictions	Adults convicted for a sex offence, released from prison 5 years pre-SORN (sample 1); and 5 years post-SORN (sample 2)	5 years	1582	GBTM1 (sample 1): 3 G1 (88.1%); G2 (8.2%); G3 (3.7%) GBTM2 (sample 2): 3 G1 (87.4%); G2 (9.7%); G3 (2.9%)

Table 1 (continued)

Authors	Country	Outcome	Sample	(Average) follow-up period for GBTM	Sample size	# Trajectories per GBTM
Jennings et al., 2012	USA (NJ)	Arrest records	Samples of offenders released via parole (1995–1999); Sample 1: persons convicted for a sex offense, released post-SORN ($n = 247$) Sample 2: persons not convicted for a sex offense, release post-SORN ($n = 250$)	8 years	497	GBTM1 (sample 1): 2 Low-risk (94.7%); high-risk (5.3%) -GBTM2 (sample 2): 2 Low-risk (72.8%); high-risk (27.2%)
Freiburger et al., 2012	USA (VA)	Arrest records	Sample of persons arrested for a sex offense in Virginia between 1993 and 2007 (prior and subsequent arrest records)	15 years (age 19 to 33)	500	3 G1 (17.98%); G2 (14.35%); G3 (67.67%)

Table 1 (continued)

Authors	Country	Outcome	Sample	(Average) follow-up period for GBTM	Sample size	# Trajectories per GBTM
Lussier, Van Den Berg, Bijleveld, and Hendriks 2012	The Netherlands	Convictions	Juvenile males convicted of a hands-on sex offense between 1988 and 2001	On average 14 years (age 12 to 32)	498	GBTM1 (nonsexual offending): 5 Very low rate (53.0%); late starters (21.3%); adolescent limited (11.0%); late bloomers (10.4%); high-rate persisters (4.2%) GBTM2 (sexual offending): 2 High-rate slow desisters (10.4%); adolescent-limited (89.6%)
Hendriks, Van Den Berg, and Bijleveld 2015	The Netherlands	Convictions	Juvenile males convicted of a hands-on sex offense between 1988 and 2001	On average 14 years	498	5 Low chronics (33.1%); high declining (3.8%); adolescence-limited (49.8%); high chronic (7.6%); late-onset adolescence-limited (5.6%)

Table 1 (continued)

Authors	Country	Outcome	Sample	(Average) follow-up period for GBTM	Sample size	# Trajectories per GBTM
Francis et al., 2014	USA (MA)	Charges	Adult male offenders with sex offenses referred for civil commitment Sample 1: consecutive admissions considered “sexually dangerous” and committed for treatment ($n = 489$) Sample 2: combination of a random and matched (to the committed) offenders ($n = 291$)	Records up to MTC referral (age 9 to median referral age 27 years)	780	GBTM1 (any offending): 4 Low-rate limited (45%); high-rate persistent (28%); low-rate persistent (17%); high-rate limited (11%) -GBTM2 (sexual offending): 4 Low-rate persistent (56%); high-rate limited (25%); high-rate accelerator (12%); late-onset accelerator (8%)
Lussier, McCuish, and Corrado 2015	Canada (British Columbia)	Convictions	Adolescents between 12 and 19 in open and secure custody facilities, convicted of sexual or non-sexual offences	12 years follow-up (age 12 to 23)	349	4 Low rate (20.4%); bell-shaped (42.6%); decelerating (50.4%); high-rate chronics (18.5%); and non-offenders (23.2%)

Table 1 (continued)

Authors	Country	Outcome	Sample	(Average) follow-up period for GBTM	Sample size	# Trajectories per GBTM
Cale et al., 2016	Australia	Charges	Youth aged 10 to 17 charged with a sexual offense between 2001 and 2009 and referred to a specialized treatment service	8 years (age 10 to 17)	217	4 Rare offenders (53.0%); late-bloomers (25.3%); low-rate chronic (10.1%); high-rate chronic (11.5%)
McCuish et al., 2016	Canada (British Columbia)	Convictions	Male participants in the Incarcerated Serious and Violent Youth Offender Study	8 years (age 12 to 23)	283	4 Low rate (17.7%); bell-shaped (35.0%); slow rising chronic (27.2%); high-rate chronic (20.1%)
Reale et al., 2020	Canada (British Columbia)	Convictions	Male participants in the Incarcerated Serious and Violent Youth Offender Study	8 years (age 18 to 25)	909	5 G1 (16.8%); G2 (45.8%); G3 (14.5%); G4 (9.5%); G5 (13.4%)

Table 1 (continued)

Authors	Country	Outcome	Sample	(Average) follow-up period for GBTM	Sample size	# Trajectories per GBTM
Zgoba, Jennings, and Salerno 2018	USA (NJ)	Arrest records	Males convicted of a sex offense released from correctional facilities Sample 1: before Megan's law (released between 1981 and 1994) ($n = 250$) Sample 2: after Megan's law (released between 1995 and 2000) ($n = 350$)	On average 15.43 years	547	GBTM sample 1: 3 Nonrecidivists (57.6%); moderate-rate recidivists (39.9%); high-rate recidivism (2.5%) GBTM sample 2: 3 Nonrecidivists (65.3%); moderate-rate recidivists (32.5%); high-rate recidivists (2.2%)
Walker, Kazemian, Lussier, and Na 2020	Canada (British Columbia)	Convictions	Individuals convicted of a sexual offense returning to their communities under a "peace bond" (an 810.1 or 810.2 order)	3 years	318	2 Low-offending group (77.7%); higher-offending (22.3%)
Babchishin, Eke, Lee, Lewis, and Seto 2022	Canada (Ontario)	Convictions	Males adjudicated for a child sexual exploitation material offense	On average 12 years	387	GBTM1 (sexual offense): 2 G1 (96.6%); G2 (3.4%) GBTM2 (violent offense): 2 G1 (42.7%); G2 (57.3%) GBTM3 (any offense): 4 G1 (68.7%); G2 (8.0%); G3 (17.1%); G4 (6.2%)

analyse the criminal careers of individuals that had committed sexual offences (see Table 1).¹

These 15 studies were based on samples from four different countries: Canada ($n=7$), the United States of America (further: USA) ($n=5$), the Netherlands ($n=2$), and Australia ($n=1$). All but one of these publications focused exclusively on persons that had committed sexual offences (or that exhibited sexually transgressive behaviors aimed at very young minors); only in two studies (Jennings et al., 2012; Lussier et al., 2015) persons who had committed sexual offences were compared directly with persons who had committed non-sexual offences only.

Four studies (Jennings et al., 2012; Tewksbury and Jennings, 2010; Walker et al., 2020; Zgoba et al., 2018) used group-based trajectory models to examine recidivism patterns in samples of individuals convicted of sexual offences. Given their focus on recidivism and not on the entire criminal career, these studies are not discussed in detail here. Noteworthy, however, is that when comparing recidivism trajectories of individuals convicted of a sexual offence to those convicted of a non-sexual offence and distinguishing a high-risk and a low-risk recidivism trajectory, Jennings et al. (2012) found that those convicted of non-sexual crimes were allocated to the high-risk recidivism trajectory over five times as often as those convicted of sexual crimes, suggesting that as a whole the latter group may be less crime prone.

A number of studies specifically focused on the criminal careers of those who committed a sexual offence during adolescence, typically with a limited follow-up period. As a result, these studies exclude those that commit their first sexual offence during adulthood and may fail to distinguish trajectories based on divergent criminal behavior during the later adult years. Cale et al. (2016) examined trajectories of general offending (including sexual offending) in a sample of Australian youths who were charged with a sexual offence between the ages 10 and 17 and for whom criminal career data were available until they were at least 18. Four trajectories were distinguished in these data: a “low-rate” group (53%) who hardly showed any offending prior to age 18, two “chronic” groups (22%) showing high levels of criminal charges up to age 15–16, and a “late bloomer” group (25%) whose offending slowly rose to a peak at age 17.

¹ Three retrieved studies are excluded for different reasons. One study applied GBTM to analyse the online behaviour of individuals engaged in online child sexual exploitation material (CSEM) offences (Van der Bruggen and Blokland 2021). Given that this study focuses on a particular part of the (online) offending behaviour, i.e. communications on a Darkweb CSEM forum, and not on the frequency of sexual transgressions per se, and given that in this particular study trajectories were estimated per month active on the forum instead of age, this study is not included in Table 1. Another study (Lussier et al., 2018) focused on a group of Canadian children aged 3 to 8 followed up for approximately 6 years. This study assesses the psychosocial development of these children drawing on parent-reported behaviours based on the Child Sexual Behavior Inventory. As this cannot be equated with sexual offending behaviour (or any other offending behavior) per se, this study is not included either. Finally, Lussier et al. (2019) used GBTM to examine the history of Child Protective Services referrals in a group of adolescents showing sexual behavioural problems. These referrals and the estimated trajectories resulting from the analysis related primarily to children’s victimisation of (sexual) abuse and neglect rather than their own offending.

McCuish et al. (2016) examined offending trajectories in a Canadian sample of 52 incarcerated male youths charged with a sexual offence between ages 12 and 17 and a sample of 231 likewise incarcerated male youths who were not charged with or self-reported committing a sexual offence prior to age 18. This study identified four trajectories (bell-shaped, 35%; low rate, 18%; high-rate chronic, 20%; slow-rising chronic, 27%). Trajectory estimates were based on the two samples combined. Posterior assignment probabilities did not differ between the two samples, which were taken to indicate that the distinguished trajectories captured variation in criminal development equally well in both samples. Extending the samples used by McCuish et al. (2016), Reale et al. (2020) estimated criminal trajectories between ages 18 and 25 for 909 male youths, of whom 78 were charged with a sexual offence prior to age 18. This study did not find an association between a history of juvenile sexual offending and criminal development during the early adult years.

Using criminal career data from age 12 to age 32 on a sample of 498 male juveniles convicted of a sexual offence in the Netherlands, Lussier et al. (2012) and Hendriks et al. (2015) found five developmental trajectories. As 73% of the sample committed at least one additional sexual offence, and as for the majority of the sample the number of convictions for non-sexual crimes was low, the shape of these trajectories depended heavily on whether or not convictions of sexual offences were taken into account (Hendriks et al., 2015) or not (Lussier et al., 2012). Fifty-three percent of the sample showed none or hardly any non-sexual convictions prior to age 32, while 11% showed a peak in non-sexual offending during the late teens and early adult years with hardly any criminal activity beyond age 25. Roughly one in five was labelled “late starter” showing a gradual rise in offending up to a peak during the mid-twenties. Another 10% showed a similarly late peaking trajectory, but at a much higher level, these were labelled “late bloomers”. Finally, 4% of the sample showed an early onset of offending and a high non-sexual offending frequency until age 21, followed by a gradual decline. By age 32, the estimated conviction rate of these “high-rate” offenders was highest, second only to the “late bloomers” (Lussier et al., 2012).

Lussier and colleagues (Lussier and Davies, 2011, 2015; Lussier et al., 2010) examined the offending trajectories of 246 men incarcerated for a sexual crime to a federal penitentiary in Québec, Canada between April 1994 and June 2000 who were convicted to a prison sentence of at least 2 years and who were at least 36 years old at the time of their incarceration (with an average age of 45.4 years). Hence, these studies retrospectively analysed the criminal careers of men who committed at least one sexual offence during their later adult years while excluding those who only had committed sexual offences prior to age 36. Furthermore, despite the 24-year observational period, trajectories were estimated on only four time points: 12–17, 18–23, 24–29, and 30–36 years, whereby the 12–17 pertained to self-reported convictions, while officially recorded convictions were the outcome variable during the other periods. Over half (56%) of the adults convicted for a sexual offence were not convicted or only at a very low rate prior to age 36. About one in four (26%) showed a general criminal trajectory that peaked during the 18–23 year period. Similarly shaped but at a higher level, 8% of the sample labelled “high-rate chronics” were convicted at least bi-annually on average during all periods. Finally, the analysis revealed a “late-blooming” trajectory (10%) of men whose conviction rate increased

from their mid-twenties onward (Lussier et al., 2010). In two follow-up studies using the same sample but limited to the 18–35 age period and only considering violent and sexual offending, Lussier and Davies (2011, 2015) distinguished abstainers (61.0%) from low-rate offenders (31.7%) and high-rate increasers (7.3%), with the latter showing increased levels of sexual and violent offending already during the ages 18–23 and 24–29 but a further escalation between ages 30 and 35.

Freiburger et al. (2012) examined the criminal careers of a random sample of 500 individuals arrested for committing a sexual offence, but applied trajectory models only to these individuals' sexual offending between ages 19 and 33. Cross-tabulating trajectory membership with measures of non-sexual recidivism revealed that those following a more consistent sexual offending trajectory were more likely to recidivate with a non-sexual offence.

Francis et al. (2014) estimated criminal trajectories for 780 men referred for civil commitment at the Massachusetts Treatment Center, which, according to the authors, are likely to constitute a more serious subset of offenders. Trajectories spanned the time from age 9 up to the time of referral, which was between 54 and 58 at the latest in this sample, binned in 10 consecutive 5-year periods. Four trajectories regarding “any offending” were distinguished. Both the “low-rate limited” group (45%) and the “high-rate limited” group (11%) followed a bell-shaped trajectory peaking during their twenties. In contrast, offending in the “low-rate persistent” (17%) group and the “high-rate persistent” group (28%) continued to increase during the adult years up to the moment of referral.

Finally, Babchishin et al. (2022) analysed the adult criminal histories of a sample of 387 men convicted of at least one child sexual exploitation material offence, from age 18 to age 60. Their analysis distinguished between four general offending trajectories. The majority of men in this sample (68.7%) were “specialists” and committed no or hardly any non-sexual crimes. Two other groups, making up 17.1% and 8.0% of the sample, showed low levels of non-sexual offending in early and late adulthood respectively. A small group (6.2%) showed a trajectory that was characterised by a decline in crime during early adulthood followed by a peak during the late forties.

Despite differences in sample, outcome measure, and follow-up period, some preliminary conclusions from these studies can be drawn. First, across studies, a considerable share of individuals convicted of sexual offending (18–68%) shows either no or only a very limited amount of non-sexual offending. Sexual recidivism in these individuals appears to be low. A substantive minority, on the other hand, shows a considerable amount of non-sexual offending (4–22%). As the studies' follow-up increases, the percentage of high-rate chronics in the sample declines, indicating increased desistance from frequent offending with increasing age. A number of studies finds a “late blooming” trajectory (8–27%) in which non-sexual offending begins later in life. Depending on the follow-up period, however, what is considered “later” varies considerably in terms of calendar age. Finally, studies on adult samples find a trajectory that follows the age-crime curve in which sexual offending follows a peak period of non-sexual offending during late adolescence and early adulthood (11–45%). These findings show that though some individuals who have committed a sexual offence can be considered “specialists” others are “generalists” in the sense that, apart from their sexual offence(s), they also commit non-negligible amounts of non-sexual offences.

The Current Study

This study addresses two research questions: 1) how do criminal career parameters differ between individuals committing sexual and non-sexual offences in Belgium and the Netherlands? and 2) using a group-based trajectory modeling approach, which criminal trajectories (number of groups and shapes) can be identified among individuals committing sexual and non-sexual offences in both countries?

The current study adds to the line of research described above in four ways. First of all, this study draws on persons convicted for sexual offences and persons convicted for non-sexual offences, thus bringing in a dimension of comparison that is absent in most other GBTM analyses that focus on sexual offending. Second, the study makes use of nationally representative samples of persons convicted for sexual offending: all persons convicted for a sexual offence in a certain year and a representative (10% random) sample of persons convicted for non-sexual offences. Third, this study draws on longitudinal national conviction data with the entire conviction record from age 12, with about 18 years of follow-up after the index year. Given individuals' average age in the index year, for many in our samples, our data cover the major part of the life-course. Fourth, this study includes data from Belgium and the Netherlands. Because we are comparing international results, we can assess whether our findings are specific to one country or may be more generalisable. Although noteworthy exceptions come to mind (e.g. Farrington and Wikström, 1994), Elonheimo and colleagues note that “only very few [studies] have actually compared criminal career dimensions across national boundaries” (Elonheimo et al., 2017: 142). Comparative research on criminal careers “would help determine the extent to which criminal careers are truly universal and replicable” (Farrington, 2015: 390). The current comparison makes it possible to determine whether results across Belgium and the Netherlands are, or, when distinguished criminal career parameters in these countries diverge, to ascertain what the differences are and how they can likely be explained. As such, the research at hand is in line with what Farrington describes as “the collaborative method”, namely, a collaboration between researchers from multiple countries (Farrington, 2015: 387).

Findings from the current study may have important implications for science, policy, and public opinion. If the criminal careers of those who commit sexual offences are highly similar to those who commit non-sexual offences, the question arises as to whether both forms of offending may be largely similar and share the same underlying causes (Blokland, 2018; Blokland and Lussier, 2015a). In terms of policy, the question then becomes whether these similarities should play a role in drawing up policy measures in relation to individuals who have committed a sexual offence and to what extent they legitimise that those who have committed a sexual offence are treated differently from those who have committed a non-sexual offence by the criminal justice system (e.g. sexual offender registration and notification, housing bans, etc.). If scientific evidence for a separate approach to individuals who sexually offend is lacking, this raises questions about the use of scientific findings by policy-makers. In short, we aim for our research to contribute to a more empirically grounded view of sexual offending and individuals committing sexual offences.

Method

Data

National Conviction Data

Criminal career research requires “a detectable rate of offending during some period” (Blumstein et al., 1986: 2). Some criminal career investigations use self-reports, yet most criminal career studies use official crime data based on police contacts, arrests, or convictions (Piquero et al., 2003). Each type of data source has its own advantages and disadvantages (Blumstein, 2016), and ideally the two are combined. Unfortunately, data from both sources are rarely available for the same large cohort over longer periods of time (two interesting exceptions are Farrington et al. (2003) and Farrington et al. (2013)), let alone across different countries.

Given that we are interested in charting long-term patterns of offending in large representative cohorts across two countries, in this study, we rely on official data, namely, data on all registered convictions for all individuals who were convicted of a sexual or a non-sexual offence during the index year, i.e. 1995 in Belgium and 1997 in the Netherlands. Belgian national conviction data were obtained from the Central Criminal Records Department (Robert et al., 2015); Dutch data were obtained from the Research and Documentation Centre (WODC) based on recidivism monitoring data (Wartna et al., 2011). For the criminal cases registered, data available for the study contain information on the type of offence, the date of commission of the offence, the date of the conviction, and the nature and severity of the sentence received.²

Sexual and Non-Sexual Offender Samples

For the sake of brevity and clarity of the results, we will refer to individuals who respectively committed sexual or non-sexual offences based on the type of offence for which an individual was convicted. In this study, therefore, a “sexual offender” is an individual who has been convicted for a sexual offence in the index year (1995 in Belgium and 1997 in the Netherlands). We use this term cautiously, as we are aware that using the term “sexual offender” entails the risk of reifying those who committed sexual offences as a separate category and reduces individuals to their commission of a single offence.

For both the Belgian and the Dutch data, the index year conviction of those labelled “sexual offenders” mainly concerns rape offences (respectively including s.375 of the Belgian Penal Code, BPC, and s. 242 of the Dutch Penal Code,

² Unlike in Belgium, the Dutch dataset also included information about dates and types of adjudication, cases not resulting in a guilty verdict and dismissals for policy reasons. The Belgian data only included judicial decisions amounting to a conviction or a court-imposed measure; adjudications are registered in other databases.

DPC), sexual assault (respectively s.372–374 BPC and s. 246 DPC), and public indecency (respectively s.385–386 BPC and s. 249 DPC), in addition to certain specific sexual offences, such as the trade or distribution of child pornographic material (respectively s. 383bis BPC. and s.240b DPC).³ “Non-sexual offenders”, on the other hand, were defined as those not convicted of a sexual offence in the index year or in any of the preceding or following years. That is, the non-sexual offenders had no sexual offence convictions in their entire registered criminal career. If an individual had both a sexual conviction and a non-sexual conviction in the index year, the individual was considered a sexual offender in the current study.

The following national samples were acquired. The Belgian dataset contains all individuals convicted in 1995 ($N=136,530$), including all individuals convicted for a sexual offence in 1995 ($n=882$). The Dutch dataset contains all individuals convicted in 1997 ($N=153,252$), including all individuals convicted for a sexual offence in 1997 ($n=1677$). A 10% random sample was drawn from both datasets to represent the non-sexual offender population, so that calculations could be done efficiently. This resulted in 13,137 non-sexual offenders in the Belgian dataset and 13,365 non-sexual offenders in the Dutch dataset.

Follow-up period

Both datasets contain data on all persons with a conviction in the index year, covering all registered convictions from age 12 to their age at the end of the follow-up.⁴ The index years chosen, 1995 and 1997, allow for long follow-up periods to rigorously study individuals’ criminal careers. For the Belgian dataset, conviction data were obtained up until November 2013, while for the Dutch data follow-up ended January 2016, about 18 years after the index year for both datasets. These data are left censored, as some individuals’ criminal career may not have terminated yet by the end of the follow-up. Therefore, findings from this study might underestimate some of the criminal career parameters like age of termination, duration, and total frequency of offences. However, due to the considerable length of the current follow-up and considering the median age at the index event, we expect that our findings will be highly robust. Even for offenders whose onset was in the index year, the roughly 18 years of follow-up is likely to capture the lion’s share of the criminal career of most offenders (Piquero et al., 2003), possibly missing those with exceptionally long careers.

³ Although in the last decades, policy attention for individuals who commit sexual offences has increased and lengthier sentences or extra policies have been implemented, Belgium and the Netherlands do not operate the same restrictive policies toward these individuals as is the case especially in the USA (e.g. Sex Offender Registration and Notification) and criminal records about sex offenders (as well as about other offenders) are managed by the criminal justice system without any public access to criminal records for the wider public.

⁴ In the Netherlands, 12 is the minimum age of criminal responsibility. In Belgium, the age of 12 represents the age at which youth justice measures are registered in the criminal records.

Criminal Career Parameters

The following criminal career parameters were estimated: age of onset, age of termination, duration, frequency, and crime mix. Age of onset was defined as the age of the first offence that an individual was convicted of if information on the actual offence date was available. If not, age of onset was estimated using the median interval between offence and conviction dates for the Dutch sample. In the Belgian sample, information on the commission date was often missing, which led to the use of the conviction date for the calculation of the age of onset and the individual's age of termination. As noted before, our data are right censored; therefore, the age of termination might underestimate the true termination age for some individuals. Criminal career duration was calculated as the age of termination minus the age of onset. Frequency was calculated as the number of convictions per individual per year; the overall sum of convictions was used as a descriptive parameter. As with age of termination, both the average duration and the average total number of convictions might be affected by censoring.

There are many different types of sexual and non-sexual offences for which an individual can be convicted. Furthermore, the legislation, relevant articles, and registration practices in the conviction records also differ per country. The standard crime classification set up by Statistics Netherlands was used for both the Dutch and Belgian samples to create comparable offence type variables. Offences were classified into one of eight categories: sexual offences, violent (non-sexual) offences, property offences with violence, property offences without violence, traffic offences, vandalism or public order offences, drug-related offences, and a miscellaneous category of other offences. Finally, crime mix was calculated as the sum (range 1–8) of the different offence categories for which offenders were convicted at least once during their criminal careers.

Sample Characteristics

Sample characteristics for the sexual and non-sexual offender samples from the Belgian and Dutch datasets are shown in Table 2. The median age of sexual offenders in the index year is 35 years in the Belgian and 33 years in the Dutch sample. For non-sexual offenders, the median age is lower, 32 and 31 years, respectively. One noteworthy difference among offenders between Belgium and the Netherlands relates to the proportion of younger adults. 19.9% of all sexual offenders in the Netherlands are, at most, 18 years of age at the index conviction, in contrast to 6.9% for Belgian sexual offenders. For non-sexual offenders, the proportion of offenders of 18 years or younger at the index conviction is, respectively, 11.1% for the Netherlands and 2.9% for Belgium. Males and females are included in both sexual and non-sexual groups in the analysis. The large majority of both sexual and non-sexual offenders are male, with males being even more overrepresented in the sexual offender samples. Because data on nationality was unavailable, country of birth was used as a proxy. In the Belgian dataset about two-thirds of sexual and non-sexual offenders were born in Belgium. Similarly, in the Dutch dataset, about 75% of sexual and non-sexual offenders were born in the Netherlands. Note that for non-native individuals (part of) the criminal career may be underestimated, as information on foreign

Table 2 Descriptive statistics on Belgian and Dutch sexual and non-sexual offender samples

		Belgium (1995)		Netherlands (1997)	
		Sexual offenders (N = 882)	Non-sexual offenders (N = 13,137)	Sexual offenders (N = 1677)	Non-sexual offenders (N = 13,365)
Age at index event	-median (IQR)	35 (17)	32 (17)	33 (24)	31 (18)
	-min-max	12–88	12–88	12–75	12–80
	<i>n</i> missing	-	-	-	-
	Male (%)	94.6%	82.8%	98.3%	84.6%
Sex					
	- <i>n</i> missing	6	79	2	36
Country of birth	BE*/NL*	68.2%	67.4%	77.9%	70.3%
	<i>n</i> missing	172	2587	1	95

*Country of birth was used as a proxy for nationality

convictions may be incomplete in both datasets. Both datasets also contain some missing data on these characteristics because of unreliable or incomplete registration (for details on missing registry data in the Belgian dataset see Robert et al., 2015).

Statistical Analyses

Comparison of Criminal Career Parameters

Sexual and non-sexual offenders were compared in two steps. First, we compared the sexual offender and the non-sexual offender groups, describing the onset, duration, termination, frequency, and crime mix in the sexual and non-sexual offender groups. Since most of the data does not follow a normal distribution, for each criminal career parameter, we provide descriptive values, including the median and inter-quartile range (IQR, range between the 25th and 75th percentiles), as well as the minimum and maximum values. Crime mix was studied as the number of different types of offences committed in the total career, with a higher rank indicating more diversity. As the large sample sizes in this study can rapidly lead to statistical significance for small differences, *p*-values were complemented by effect sizes. The groups were compared based on Kruskal–Wallis (“one-way ANOVA on ranks”) for non-parametric data with unequal sample sizes. Post hoc Dunn–Bonferroni pairwise tests were conducted. These tests allow for a further assessment of differences and similarities between criminal career parameters across the four groups. The effect size, here the partial η^2 squared (η^2), is calculated for the Kruskal–Wallis group comparisons (Ellis, 2010; Lenhard and Lenhard, 2016). In accordance with Cohen’s rule of thumb with η^2 squared values, effect sizes lower than 0.06 are considered small, from 0.06 they are medium, and effect sizes of 0.14 upward are large (Cohen, 1988; Ellis, 2010: 41). An effect size smaller than 0.01 can be considered a very small or trivial effect (see also Ellis, 2010: 41).

Group-Based Trajectory Modeling (GBTM) and Trajectory-Group Comparisons

Second, we studied the criminal career trajectories for our different samples based on the frequency of convictions using GBTM. The group-based method was developed especially for summarising and studying longitudinal data and showing developmental patterns of behavior over time (Nagin, 2016). As mentioned above, it is often used in criminology (Jennings and Reingle, 2012; Piquero, 2008) and is increasingly being used in other fields of research, such as clinical psychology, epidemiology, and medicine (Nagin, 2016; Nagin and Odgers, 2010). GBTM is based on the assumption that a population consists of various subgroups which can be distinguished based on their patterns, both level and shape, of behavior over time, in this case the frequency of convictions. For instance, a group showing an early onset of offending and a long criminal career duration can be distinguished from groups with a shorter criminal career and an early or late onset of offending. In GBTM, all subjects are assigned to one of several groups based on statistical likelihood (Nagin, 1999). The trajectory model is advantageous compared to other ways of categorising offenders, because it simultaneously takes into account multiple career parameters such as onset, frequency, and duration. However, because the optimal number of groups is chosen based on statistical indicators (described below), the theoretical and practical relevance of the classification must be made plausible by further comparison and replication (Nagin, 2016; Nagin and Tremblay, 2005). Here, GBTM models are estimated separately for Belgian and Dutch sexual and non-sexual offenders. Since the age at the index offence differs between sexual and non-sexual offenders in both countries, weights are created for non-sexual offenders' trajectories.

STATA 15 was used for GBTM. Trajectories in the current study are based on the number of convictions per age per person at the age of 12 onward. Models are censored at age 70, because sample sizes dropped rapidly after this age. The optimal number of groups can be chosen based on the Bayesian Information Criterion (BIC) and Akaike's Information Criterion (AIC) values; higher (less negative) BIC and AIC values indicate a better model fit. Additionally, more subjective interpretation based on the content of the groups can be used as a ground to choose a certain number of groups (Bijleveld et al., 2015; Nagin & Tremblay, 2005). Here, cubic polynomial functions are used to estimate trajectories using a zero-inflated Poisson model. Cubic splines with one knot at age 20, 30, or 40 were added to correct for increasing slopes at later ages that resulted from the use of the cubic function but did not reflect patterns in the data (Blokland et al., 2005). We calculated between one and seven trajectories per model, in combination with different cubic splines (at knot 20, 30, or 40).

Lastly, the criminal career parameters of similar trajectory groups were compared across the four groups (sexual offenders and non-sexual offenders from Belgium and the Netherlands) using Kruskal–Wallis (“one-way ANOVA on ranks”) for non-parametric data with unequal sample sizes (and in some comparisons also non-similar distribution). Post hoc Dunn–Bonferroni pairwise tests were conducted to further assess differences and similarities between criminal career parameters for trajectory groups across the four models. Effect sizes were calculated (partial η^2 squared values) for the Kruskal–Wallis test and for every pairwise test based on separate Mann–Whitney comparisons (with Mann–Whitney U and group sizes as the basis for the effect size; Lenhard and Lenhard, 2016).

Results

Criminal Career Parameters

First, criminal career parameters were compared between sexual and non-sexual offenders in Belgium and the Netherlands (see Table 3).

Table 3 Comparison of criminal career parameter between sexual and non-sexual offenders per country

	Belgium (1995)		Netherlands (1997)	
	Sexual offenders (<i>N</i> =882) ^a	Non-sexual offenders (<i>N</i> =13,137)	Sexual offenders (<i>N</i> =1677)	Non-sexual offenders (<i>N</i> =13,365)
Age of onset				
Mean (SD)	29.04 (11.6)	29.9 (12.88)	29.94 (14.60)	28.72 (12.55)
Median (IQR)	25.5 (14)	25 (14)	26 (22)	25 (16)
Min–max	12–80	12–88	12–75	12–97
Kruskal–Wallis (KW): χ^2 (3, <i>n</i> =28,934)=118.340, <i>p</i> <0.001; <i>D</i> ² =0.004 (vs)				
Age of termination				
Mean (\pm SD)	41.87 (12.48)	40.67 (12.79)	39.96 (14.02)	38.95 (12.87)
Median (IQR)	41 (17)	39 (17)	39 (20)	38 (19)
Min–max	16–83	12–92	13–80	12–97
KW: χ^2 (3, <i>n</i> =28,934)=121,221, <i>p</i> <0.001; <i>D</i> ² =0.004 (vs)				
Duration in years				
Mean (\pm SD)	12.83 (11.67)	10.77 (10.64)	10.03 (10.30)	10.23 (10.34)
Median (IQR)	12 (20)	9 (18)	8 (18)	8 (18)
Min–max	0–63	0–63	0–48	0–56
KW: χ^2 (3, <i>n</i> =29,060)=48,423, <i>p</i> <0.001; <i>D</i> ² =0.002 (vs)				
Frequency of convictions				
Mean (\pm SD)	6.97 (9.12)	6.13 (8.46)	4.88 (6.23)	5.43 (7.38)
Median (IQR)	4 (6)	3 (6)	2 (5)	3 (5)
Min–max	1–70	1–119	1–57	1–84
KW: χ^2 (3, <i>n</i> =29,061)=74.823, <i>p</i> <0.001; <i>D</i> ² =0.003 (vs)				
Crime mix				
mean (SD)	2.71 (1.58)	2.00 (1.23)	2.67 (1.84)	2.26 (1.55)
1 Offence type (%)	28.7	47.5	37.3	46.1
2 ""	24.7	25.2	20.8	20.7
3 ""	17.2	13.8	13.8	12.6
4 ""	13.5	8.1	10.6	9.0
5 ""	9.4	4.0	6.9	6.5
6 ""	5.2	1.3	5.9	4.0
7 ""	1.2	0.1	3.5	1.2
8 Offense types (%)	-	-	1.3	-
KW: χ^2 (3, <i>n</i> =29,061)=337,446, <i>p</i> <0.001; <i>D</i> ² =0.012 (s)				

^aDue to missing data, sample sizes for the different criminal career parameters may slightly vary. Percentage of missing values never exceeds 1%

s, small; vs, very small

Age of Onset

The mean age of onset is highly similar between sexual and non-sexual offenders in both countries. In the Belgian data, the mean age at onset is approximately 29 years for sexual offenders and approximately 30 years for non-sexual offenders; in the Netherlands, these are 30 years and 29 years, respectively. Minimum and maximum ages in the samples show that some offenders start as early as age 12 and that other offenders start as late as age 75 to 97. Sexual offenders in the Dutch sample show more variation, as indicated by a larger absolute standard deviation and IQR. Overall, the very weak effect size ($\eta^2=0.004$, see Table 3) suggests that the four groups do not differ in a substantively meaningful way in terms of the age of onset.

Age of Termination

In both countries, the age of termination of sexual offenders seems similar to that of non-sexual offenders. The median age of termination in Belgium is 42 years for sexual offenders and 41 years for non-sexual offenders; in the Netherlands, these are 40 years and 39 years respectively. Variances are similar, with an IQR that ranges from 17 to 20 years. The maximum age of termination is quite high in all groups (max range 80–97), but this is caused by exceptional cases. The age of termination comes later for sexual offenders than for non-sexual offenders, but the effect size is again negligible ($\eta^2=0.004$), which suggests that the age of termination across the four groups does not differ in a substantive way.

Duration

In Belgium, the mean duration of sexual offenders' criminal careers is longer than that of non-sexual offenders: 13 versus 11 years. Sex offenders start earlier and stop later. In this case, the very small differences in age of onset and age of termination add up. In the Netherlands, sexual offenders show slightly shorter criminal careers than non-sexual offenders. In all samples, the duration of criminal careers is right-skewed: a large part of the persons included have a criminal career of less than 1 year (overall: 31.8%), while 5% of all criminal careers exceed 30 years and 1% surpasses 38 years in duration. Yet, as the low effect size ($\eta^2=0.002$) indicates, the duration of the criminal career does not differ in a substantive way across the four groups.

Frequency of Convictions

Regarding the frequency of convictions, a similar pattern emerges. The distribution of the frequency of convictions differs across all four groups. Not only are there differences between sexual and non-sexual offenders between the two countries; the direction of this difference is reversed. Sexual offenders in Belgium have more

convictions than non-sexual offenders. The Dutch data show an inverted image. In the Netherlands, non-sexual offenders have more convictions on average than sexual offenders. For this parameter, the effect size is again very low ($\eta^2=0.003$), which points toward a lack of meaningful substantive differences among the four groups in terms of their frequency of convictions.

Crime Mix

Based on the classification in eight different offence types (as discussed in the “[Criminal Career Parameters](#)” section), we tested whether the crime mix for sexual offenders differs from that of non-sexual offenders. We found that non-sexual offenders were less diverse in their offending than sexual offenders in both countries. In other words, sexual offenders commit different types of offences to a larger extent than non-sexual offenders. The average crime mix in non-sexual offenders is a little over two, whereas sexual offenders show an average crime mix closer to 3; also, the variance is somewhat larger in these groups. However, these differences are small and may partly result from the sample selection, as non-sexual offenders have, by definition, not accrued any conviction for sexual offences. Kruskal–Wallis results have a very low effect size ($\eta^2=0.012$), suggesting no substantive difference among the four groups in terms of crime mix.

Overview of Criminal Career Parameter Results

The above analysis finds differences in criminal careers parameters to reach statistical significance; yet, the very small or trivial effect sizes in all cases suggest these differences are likely a result of the large sample sizes rather than substantive differences. Based on the above, we therefore conclude that no substantive differences are found between the criminal career parameters of sex offenders and those of non-sex offenders in Belgium and in the Netherlands. One important limitation here is that this comparison treats both groups (sex offenders and non-sex offenders) as homogeneous. In what follows, each group is further differentiated.

Group-Based Trajectory Models

GBTM was used to distinguish trajectories of offending in sexual and non-sexual offenders in Belgium and the Netherlands. Regarding the optimal number of groups, one option emerged that provided an optimised fit for the four datasets: a four-group model (see Table 4). Results distinguish four groups of sex offenders and non-sex offenders in both Belgium and the Netherlands, each with a distinct trajectory of offending throughout the life course.

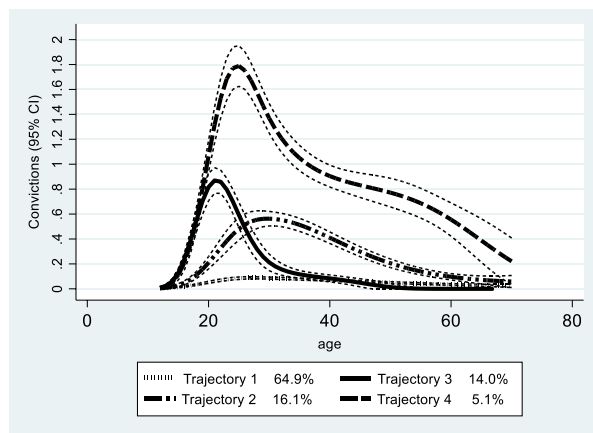
Results from the four-group GBTM models are presented separately for sex offenders and non-sex offenders from Belgium and the Netherlands in (Figs. 1, 2, 3, and 4) and show the estimated yearly number of convictions (and the 95% confidence interval around that estimate) by age. Each figure depicts four trajectory groups, with

Table 4 Fit indices for group-based trajectory models on convictions in sexual and non-sexual offenders

Country	Offenders	Groups	Spline	BIC		AIC	
BE	Sexual	4	20	-15,367.28	-15,324.28	-15,269.28	-15,246.28
	Sexual	4	30	-15,365.91	-15,322.90	-15,267.91	-15,244.91
	Sexual	5	30	-15,286.26	-15,232.04	-15,162.70	-15,133.70
	Non-Sexual	4	20	*	*	*	*
	Non-Sexual	4	30	-206,660.04	-206,617.23	-206,531.17	-206,508.17
NL	Non-Sexual	5	30	-205,099.27	-205,045.29	-204,936.78	-204,907.78
	Sexual	4	20	-22,922.56	-22,879.78	-22,817.40	-22,794.40
	Sexual	4	30	-22,945.08	-22,902.30	-22,839.92	-22,816.92
	Sexual	5	30	*	*	*	*
	Non-Sexual	4	20	*	*	*	*
	Non-Sexual	4	30	-189,652.34	-189,609.81	-189,5230.55	-189,5000.55
	Non-Sexual	5	30	*	*	*	*

BE, Belgium; NL, The Netherlands

* Model did not converge

Fig. 1 Trajectory model, sexual offenders (Belgium)

each group consisting of individuals showing a similar development pathway of their criminal career. One striking result is the remarkably similar shape of the four trajectories across the four datasets. A second striking result concerns the highly similar distribution (in percentages) of the four trajectories across offender type and country. Each trajectory model distinguishes a group of approximately 65%, a group of approximately 17.5%, a group of approximately 12.5%, and a group of 5%.

To formally test whether offenders from different samples and different countries allocated to similar groups showed similar criminal career parameters, we performed Kruskal–Wallis tests, followed by post hoc pairwise comparisons between trajectory groups and a calculation of the effect size. For reasons of parsimony, we report only the Kruskal–Wallis test results in Table 5. Due to the many pairwise comparisons (4

Fig. 2 Trajectory model, non-sexual offenders (Belgium)

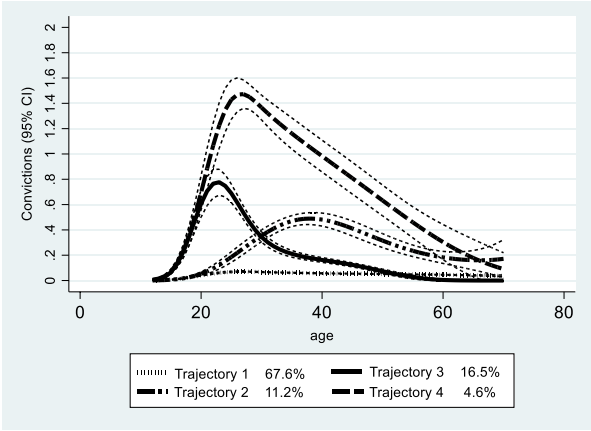


Fig. 3 Trajectory model, sexual offenders (the Netherlands)

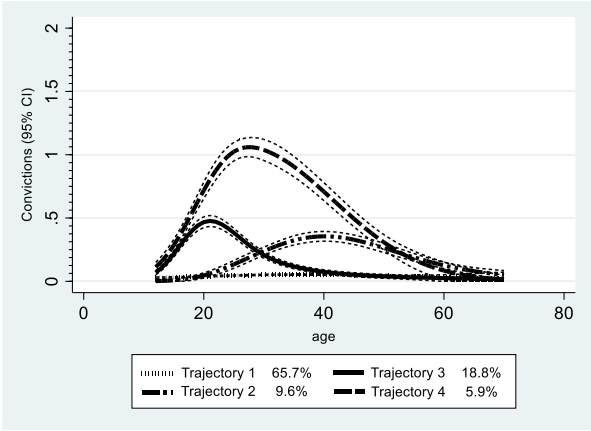


Fig. 4 Trajectory model, non-sexual offenders (the Netherlands)

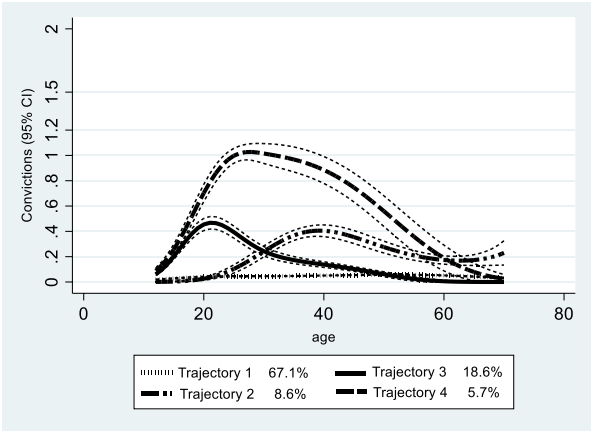


Table 5 Criminal career parameter comparisons (Kruskal–Wallis) per trajectory group

Group	Parameter	<i>N</i>	χ^2	df	<i>P</i>	η^2
Low-level offending group	Onset	19,483	86,904	3	***	0.004 (vs)
	Desistance	19,483	109,702	3	***	0.005 (vs)
	Duration	19,483	467,153	3	***	0.024 (s)
	Frequency	19,483	125,543	3	***	0.006 (vs)
	Crime mix	19,483	242,344	3	***	0.012 (s)
Late onset offending group	Onset	2829	761,129	3	***	0.268 (l)
	Desistance	2829	583,318	3	***	0.205 (l)
	Duration	2845	120,813	3	***	0.042 (s)
	Frequency	2845	342,782	3	***	0.12 (m)
	Crime mix	2845	349,270	3	***	0.123 (m)
Adolescence and young adult offending group	Onset	5075	1,607,193	3	***	0.316 (l)
	Desistance	5075	505,809	3	***	0.099 (m)
	Duration	5075	169,713	3	***	0.033 (s)
	Frequency	5075	307,375	3	***	0.06 (s)
	Crime mix	5075	215,245	3	***	0.042 (s)
Persistent offending group	Onset	1547	439,705	3	***	0.283 (l)
	Desistance	1547	6893	3	n.s	0.003 (vs)
	Duration	1556	171,141	3	***	0.108 (m)
	Frequency	1556	182,818	3	***	0.116 (m)
	Crime mix	1556	252,013	3	***	0.16 (l)

vs, very small; s, small; m, moderate; l, large

groups, 5 career parameters per group, with 6 pairwise comparisons per parameter, totalling 120), and given that most pairwise comparisons (98 out of 120) were found to be significantly different (at $p < 0.05$), these are not reported. Effect sizes were also calculated for these pairwise comparisons (based on Mann–Whitney U values). For high effect sizes, we include the direction of the pairwise comparison (< or >) based on the mean ranks of the groups.

Low-Level Offending Group

The largest trajectory group in size is a group of offenders who are rarely convicted in their criminal careers ($\pm 65\%$, “trajectory 1” in Figs. 1, 2, 3, and 4). For each age, their average annual number of convictions remains below 0.1. At first glance, this group appears similar across offender type and between countries. Formal comparison of the low-level offending groups across the four models, however, shows statistically significant differences for each of the criminal career parameters. The overall

effect sizes are small (0.024 at most), and statistical significance might therefore be resulting primarily from group size.

Twenty-five out of 30 post hoc pairwise comparisons are statistically different ($p < 0.05$), but they all have small or very small effect sizes (none exceeds 0.05).

Late-Onset Offending Group

The second trajectory group consists of offenders showing a late start of their criminal career and a peak in convictions only after age 30 ($\pm 12.5\%$, “trajectory 2” in Figs. 1, 2, 3, and 4). For the sexual offenders from Belgium allocated to the late onset group, the peak in convictions is slightly after age 30 and for the Belgian non-sexual offenders around age 35. For the sexual and non-sexual offenders in the Netherlands, convictions in this group peak at age 40. The mean number of convictions ranges between 7.45 and 13.55. Formal comparison of late-onset offenders across the four models shows differences for each of the criminal career parameters, with moderate effect sizes for frequency and crime mix and strong effect sizes for onset and termination.

Three out of 30 post hoc pairwise comparisons show no statistically significant difference. In 13 of those pairwise comparisons, the effect size was moderate or high, and the remaining comparisons show low or trivial effect sizes. High effect sizes exist for onset ($>$), termination ($>$), and frequency ($>$) when comparing Belgian sex offenders with Dutch sex offenders; high effect sizes for onset ($<$) and termination ($<$) are found between Dutch sex offenders and Dutch non-sex offenders.

Adolescent and Young Adult Offending Group

A third trajectory group is convicted mainly during adolescence and young adulthood, and their offending then seems to decline rather quickly (17.5%, “trajectory 3” in Figs. 1, 2, 3, and 4). In the Belgian sex offender group, this group is first convicted soon after age 12, with an estimated peak of 0.8 convictions per person at age 22. After that, the frequency of convictions decreases rapidly until in their mid-thirties. From the ages 35–40 onward, there are hardly any convictions in this group. When formally compared, adolescent and young adult offenders were also found to be different across the four models, with moderate effect sizes for termination, frequency, and crime mix and a large effect size for onset.

Five out of 30 post hoc pairwise comparisons show no statistical difference. Three large and five moderate effect sizes are identified. Large effect sizes for termination ($<$) and duration ($<$) exist between sex offenders in Belgium and the Netherlands, and the other large effect size relates to the age of onset ($<$) between non-sex offenders in Belgium and non-sex offenders in the Netherlands.

Persistent Offending Group

The fourth trajectory group consists of a group of very persistent or chronic perpetrators who show a high peak in their convictions in adolescence and young

adulthood and who continue to accumulate many convictions throughout the rest of their adult life (5%, “trajectory 4” in Figs. 1, 2, 3, and 4). During the larger part of the observation period, the conviction frequency of offenders allocated to the persistent trajectory group remains considerably higher than is the case for all other groups. The frequency of convictions of Belgian sexual offenders allocated to the persistent offending group (trajectory 4 in Figs. 1) is the highest of all persistent groups. In the Belgian sex offender group, the frequency of convictions increases rapidly after the age of 12 years and peaks at approximately 1.8 convictions per year around age 26. Next, the frequency of convictions falls sharply until age 35 and gradually decreases until the moment of censoring (age 70). Mean conviction frequencies for these four groups range between 23.62 and 36.51, the latter coming from sex offenders in Belgium, and the former represents sex offenders in the Netherlands, with the non-sex offender groups in between. Persistent offenders are also formally compared across all four models. The Kruskal–Wallis results show differences for each of the criminal career parameters, with moderate effect sizes for duration and frequency and large effect sizes for onset and crime mix. Nine out of 30 post hoc pairwise comparisons show no significant differences. Six moderate and five large effect sizes are present, all in comparisons of groups from different countries. Three large effect sizes relate to onset (e.g. sex offenders in both countries ($>$), Belgian non-sex offenders with Dutch sex offenders ($>$), and Belgian non-sex offenders with Dutch non-sex offenders ($>$)), and a large effect size is found in frequency ($>$) between Belgian sex offenders and Dutch sex offenders and in crime mix ($<$) between Belgian non-sex offenders and Dutch sex offenders.

Overview of the GBTM Results

Two complementary conclusions can be reached from the above. First, the similarities in both the shape and distribution of the conviction trajectories in both national samples and across sexual and non-sexual offenders are striking. The criminal careers of sexual offenders, as measured by their officially registered convictions, can be summarised in four trajectory groups, which closely mirror the different trajectories found in non-sexual offenders. This is so for convicted sex offenders in Belgium as well as for convicted sex offenders in the Netherlands. At the same time, formal comparisons of the different criminal career parameters for each of the distinguished groups across offender type and country show statistically significant differences on all but one of the parameters, but when effect sizes are taken into account, this image becomes much less convincing, with only five of the 20 non-parametric ANOVA results showing large effect sizes, six of them moderate effect sizes and 9 had (very) small effect sizes. Furthermore, little systematicity could be found in pairwise comparisons between groups from different countries, be it sexual or non-sexual offender groups, with some moderate or large effect sizes but mostly trivial or low effect sizes. The exception to this comes from the late onset offending group where moderate or strong effect sizes are found between Dutch sex offenders and non-sex offenders across all five parameters.

Discussion

Conclusion

In this study, we focused on two research questions. The first research question regarding differences in criminal career parameters between those who committed sexual versus those who committed non-sexual offences in Belgium and the Netherlands was answered in two different ways. In the descriptive part, an overall comparison of the criminal career parameters between persons convicted for sexual offending and those convicted for non-sexual offending in Belgium and the Netherlands showed statistically significant differences but small to trivial effect sizes. A second comparison of criminal career parameters based on trajectory groups identified by GBTM showed statistically significant differences across the board. When looking at pairwise comparisons, many of the effect sizes are, however, trivial or low at best, with only 19 moderate and 13 large effect sizes (on a total of 120 pairwise comparisons). Furthermore, and notwithstanding a moderate effect size difference on the parameter of crime mix between individuals convicted of a sexual index offence and those convicted of a non-sexual index offence in Belgium, all pairwise comparisons between trajectory groups of the same country have trivial or small effect sizes. This raises further questions about underlying differences between those committing sexual offences and those who do not but indicate more similarities than differences overall, especially looking at differences within each country. One further indication of such similarities has recently been found based on a latent class analysis of past convictions of these groups (Spaan et al., 2020).

As for the second research question regarding criminal trajectories identified among those who committed sexual versus those who committed non-sexual offences, data for those convicted of a sexual offence and those convicted of a non-sexual offence in both countries preferred a four-group model with similarly shaped trajectories and with similar proportions per trajectory group. These are low-level offending groups (65%), late-onset offending groups (ca. 12%), adolescence and young adult offending groups (ca. 17%), and persistent offending groups (ca. 5%). Based on the trajectory analysis, it appears that strongly similar patterns are present in criminal careers of those who commit sexual versus those who commit non-sexual offences in Belgium and the Netherlands. This is in line with the similarities and limited differences that we mention in the descriptive section. The number of trajectory groups distinguished falls within the range of what is commonly found in prior studies (see Table 1). The shape of these trajectories also mirror those found in prior research, especially in studies using adult samples. The current results are perhaps most reminiscent of Lussier et al.'s (2010) criminal trajectories of adults imprisoned for committing a sexual offence who distinguished among very low-rate offenders, late bloomers, low-rate desisters, and high-rate chronics, but the results here differ in that our data are based on convictions while the Lussier et al. study selected persons admitted to a Canadian federal penitentiary for a sexual offence. Our results include a wider frame of persons convicted for offending, including those not sent

to prison.⁵ Furthermore, the current study results are strengthened by large sample sizes, availability of complete national conviction data over a long follow-up period, and a comparison between countries.

The larger effect sizes when comparing groups across countries rather than between those who committed sexual versus those who committed non-sexual offences per country suggest possible underlying differences between countries. There may be differences between countries in the phenomenon of sexual offending (more on this in Spaan et al., 2020). It is possible that the number of individuals who commit sexual offences, reporting of sexual offences by victims, registration of offending, handling of cases, and sentencing practices differ per country and influence findings on, for instance, frequency and crime mix. It is striking that the number of convicted sexual offenders in Belgium in 1995 is about half of that in the Netherlands in 1997 (882 versus 1677), while the total national population is about two-thirds the size (10.13 million in Belgium (1995) and 15.57 million in the Netherlands (1997)) and the total convicted population is almost 90% of the size of the Dutch sample (136,530 in Belgium and 153,252 in the Netherlands). In part, important differences exist in the proportions of young individuals convicted for a sexual offence between both countries, and similar differences exist between those convicted for non-sexual offences, which reflect another approach in dealing with young offenders. Further research, also into the broader penal culture within each country and into the way in which the policy deals with perpetrators of sexual offences, is needed to be able to contextualise these differences.⁶ It is possible that a combination of age, cohort, and period effects are in play here, including differential criminal justice attention between Belgium and the Netherlands for individuals who committed sexual offences, which might explain important differences (e.g. Francis et al., 2015). It is, thus, important to be aware of the lack of important differences between groups per country, while some differences do emerge when comparing groups across countries. This goes some way toward illustrating the difficulties of comparative work when drawing upon official crime data.

⁵ The current analysis is based only on conviction records. It was not possible to correct for time in detention. This would require systematic links between conviction records and detentions, which, at the time of the study, was not possible for the Belgian data. On the one hand, the absence of detention data (and the time spent in prison) implies that the opportunity structure for committing (sex) offences is different for those in prison in comparison to those with a conviction who do not serve time behind bars. On the other hand, the time at risk when in detention should not be reduced to zero either, as convictions also occur for offences committed during detention.

⁶ After a notorious case erupted in the summer of 1996, the topic of sex offending and sex offenders became much more central in criminal justice policies in Belgium (e.g. Robert, 2021). The so-called Dutroux case led to a sea change in criminal justice at large. Dutroux and others had kidnapped six young girls; two of them were found alive in his basement after months of abuse, and the bodies of four others were found. Since 1996, several policies that target individuals who have committed a sexual offence have been introduced, including a residential restriction, longer prison sentences, residential treatment after the prison sentence, etc. However, unlike several mostly Anglo-Saxon countries, there is no sex offender register. Criminal records are not publicly accessible either; certificates of conduct might be asked by potential employers, and restrictions regarding contacts with children can be mentioned.

Limitations and Future Research

In addition to differences in datasets and penal cultures between countries, other limitations may impact the generalisability of the findings. In this contribution, “sexual offenders” are defined as individuals who have been convicted of a sexual offence, which, per definition, is only a selection of all persons who commit sexual offences. Whether and how the findings can be generalised to sexual offenders with self-report data, without a conviction, or with another registration method (e.g. arrests or prosecution without conviction) remains unclear. Further research on the dark figure, grey figure, and impunity bias is needed, including the comparison of sexual offences with other types of offences.

Also, we did not conduct further analyses of types of sex offending but used a compound categorisation. This puts together all types of sex offences in one single category, but further analyses should zoom in more on types of offences. This to some extent taps into the debate about the crime mix, where overall comparisons showed a slightly higher crime mix of individuals that commit sex offences in comparison with those that do not. Although sex offences are measured as one category, one could imagine further analyses of specialisation within the larger category of sex offences (e.g. child molestation, rape, sexual assault, and child sexual exploitation material offences), in combination with a more versatile non-sexual criminal career (e.g. Soothill et al., 2000).

Based on this research, several new questions arise for future research. For example, future studies might investigate what risk factors are specific to sexual offending and what risk factors predict both sexual and non-sexual offending. Developmental and life course research in criminology points to antisocial propensity as a possible underlying variable for differences in the criminal career. In the group following a life-course persistent trajectory, it is generally found that they exhibit a greater degree of antisocial propensity (Farrington, 2003; Moffitt, 1993). In this study, we identified very similar criminal careers for both those who committed sexual and those who committed non-sexual offences, each with a very persistent yet small group of perpetrators who continue to commit offences throughout the larger part of their life course. This group may differ with regard to antisocial tendencies from those in the other trajectory groups. Other trajectories may result more from contextual influences like varying levels of social control experienced through the life course. Whereas the effects of local life circumstances like employment, marriage, and parenthood have been well researched among individuals committing non-sexual offences, few studies have addressed the effect of local life circumstances on offending in those who have committed sexual offences (Blokland and Van der Geest, 2015c; Kruttschnitt et al., 2000). Such questions cannot be answered on the basis of the current study but require detailed information about persons (biopsychosocial factors) and events (context and situation of offences). Providing detailed answers about these questions would help shed light on the theoretical debates about the similarities and differences of sex offending compared to other types of offending (e.g. Lussier and Mathesius, 2018). As most individuals convicted of a sexual offence, like most convicted of a non-sexual offence, come to desist at some point, stopping their criminal career, albeit at different ages, this also requires further scientific attention. Why and how offenders come to desist at different ages, following different criminal career paths, also require more

in-depth research on the underlying mechanisms that bring about desistance among both sexual and non-sexual offenders (e.g. Farmer et al., 2015).

Also, further replication of this study, drawing on more year-based cohorts from Belgium and the Netherlands, would be important in settling whether and to what extent the current analysis suffers from age, period, and cohort effects. Replications in other jurisdictions would also help to assess the external validity of these findings and whether they are a resultant of comparing two relatively liberal penal systems and how individuals convicted for sexual offences are being dealt with in both countries.

Implications

The results of this study also cast a shadow over the negative policy attention with regard to sexual offenders. If criminal careers of sexual offenders do not differ strongly from those of non-sexual offenders and are not characterised by a high degree of specialisation in sexual offences (the crime mix was higher for sexual offenders), it begs the question of the scientific basis for policies such as housing bans. It may be preferable to coordinate policy initiatives with the criminal career and its course in order to stimulate desistance and termination of the criminal career. The results of the trajectory analysis show that crime is decreasing within each trajectory group, also for those convicted of sexual offences, even for the most criminally active group. Some policies may even have negative or reinforcing effects on further sexual and non-sexual offending. For example, residential restrictions may contribute to homelessness and decreased social ties, which are risk factors for further offending (Levenson et al., 2015). For the wider public, those who commit sexual offences are sometimes perceived as folk devils who must be banned from our midst (Stafford and Vandiver, 2017). What emerges from this study is that those who commit sexual and non-sexual offences might not be so different after all. With this contribution, we hope to be able to provide a little more nuance about sexual offending to a wider audience.

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Declarations

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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