When and where we are: Comparing early criminal careers of organized crime offenders in Italy and the Netherlands across decades

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ABSTRACT

Purpose: This study examines the early criminal careers of organized crime offenders in Italy and the Netherlands and assess how these behaviors have evolved across generations. We (1) compare the early careers with the entire career in the two country samples and (2) assess the influence of generational shifts and social changes on these behaviors, particularly focusing on crime control policies.
Methods: Analyzing data on male offenders born between 1950 and 1986, we analyze criminal careers up to ages 23 and 30. Our analysis includes statistical assessments of differences between countries and among decades, employing multinomial logistic regressions to explore the associations between criminal career parameters and crime categories and the offenders' decade of birth.
Results: Significant differences were found between the Italian and Dutch samples, reflecting country-specific dynamics in organized crime involvement. Evidence suggests minimal generational shifts towards more serious offending, but notable impacts of social changes, especially in anti-drug and anti-organized crime policies, across individuals born in different decades.
Conclusions: Both the societal context ('where we are') and temporal influences ('when we are') are essential in understanding criminal careers. Changes in policies and social conditions differentially affected organized crime offenders in Italy and the Netherlands.

1. Introduction

When and where we are might be as important for criminal careers as who we are. The significant progress of developmental and life course criminology over the last decades has primarily focused on 'who we are', i.e. offender characteristics, risk and protective factors, and life course events. This research concentrated on specific countries, with a strong focus on the US and the UK, on adolescence and youth, and on specific periods of time (Farrington, 2015; Kleemans & van Koppen, 2020; Piquero, Farrington, & Blumstein, 2003). Both the analysis of different offending samples beyond the anglosphere and comparative research are rather scarce but could teach us a lot about various types of contexts that might influence criminal careers (Steffensmeier, Yunmei, & Kumar, 2019; Steffensmeier, Zhong, & Yunmei, 2017).

Recent years of research have shown a growing interest in the question of 'when we are', accompanied by research into different cohorts (Piquero, 2023:7). Sampson and Smith, for instance, argue that

developmental and life course criminology "should elevate the study of cohort differences in social change and, ultimately, societal character" (2021:13). Theoretically, this suggests that our understanding of criminal careers might need to be expanded. Alongside considering 'types of people' and 'types of lives', we should also consider 'types of contexts'. These contexts might systematically vary for young people as a combination of the countries or regions they grow up in – the context of place – and the different periods of time they live through – the context of time. In other words, it is important to consider 'where we are' in our analyses.

In this paper, we add to this new focus on 'when and where we are' by comparing the early criminal careers of organized crime offenders in Italy and the Netherlands in different decades. The focus on organized crime contributes to the debate about space and time context under multiple theoretically relevant perspectives. For example, the substantial variation of the meaning of organized crime and policies to prevent and combat it across space and time provides a special opportunity to examine whether and how these different notions correspond to

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different criminal careers (Calderoni, Comunale, van der Geest, & Kleemans, 2024; Fijnaut & Paoli, 2004; Varese, 2017). Furthermore, developmental and life course research has relied on samples of general offenders (Piquero et al., 2003; Sullivan & Piquero, 2016). Analyses of these samples normally reflect the growth and decline in crime rates experienced by most western, advanced countries in the last decades (Neil & Sampson, 2021; Payne & Piquero, 2020). Conversely, organized crime policies have strengthened during the same period. Analyzing the criminal careers in organized crime can thus provide insight into contexts of greater control, criminalization, and sanctioning compared to the offending trajectories of general sample during the same period (Calderoni et al., 2024).

Our study addresses the following questions: Do organized crime offenders in Italy and the Netherlands differ in their early criminal careers? Are these differences similar to those observed across the entire career in a recent study (Calderoni et al., 2024)? And are there differences across individuals born in different decades? While these questions might have important theoretical and policy implications, there is limited evidence about these dynamics. The results of our analyses show important differences between the Italian and Dutch samples, suggesting that the involvement into organized crime follows selection and enhancement dynamics specific to these two countries. Furthermore, we found substantial differences in offending patterns among individuals born in different decades. While we find scarce support for a generational shift towards more serious offending, we suggest that social change and particularly in the domain of anti- drug and anti-organized crime policies has differentially affected the criminal careers of organized crime offenders across decades and countries.

In the following section we elaborate upon the theoretical background and the literature on criminal careers in organized crime. Next, we describe the methodology of this study and the specific datasets used. We employ data on convicted male offenders from Italy and the Netherlands born between 1950 and 1986 and focus on the early criminal careers (up to age 23 and 30) to control for potential selection biases. In the results section, we explore the criminal careers of organized crime offenders, focusing on two key objectives. Firstly, we analyze whether the Italian and Dutch samples exhibit distinct criminal behaviors in their early careers, comparing these patterns to their overall criminal careers. Secondly, we assess the evolution of criminal careers across different generations, considering possible generational shifts and social changes. In the last section, we discuss the results and elaborate upon limitations and future research.

2. Background

Criminal groups may influence individual criminal behavior and criminal careers in various ways (Reiss, 1988). Extant (street) gang research has shown that gang members often exhibit higher levels of criminal behavior than non-members (McGloin & Thomas, 2019; Pyrooz, Turanovic, Decker, & Jun, 2016). Thornberry, Krohn, Lizotte, and Chard-Wierschem (1993) argue that these well-established differences may be explained by different competing processes: selection (based on pre-existing differences), facilitation (due to group processes), or enhancement (a combination of these two processes, which makes pre-existing differences diverge even further). Findings from street gang research have shown ample support for the enhancement process, thus suggesting that both selection and facilitation are present but also that they coexist and interact (Curry, Decker, & Egley, 2002; Curry, Decker, & Pyrooz, 2014; Gatti, Tremblay, Vitaro, & McDuff, 2005; Krohn & Thornberry, 2008; Melde & Esbensen, 2011; Pyrooz et al., 2016). In street gang research, observation of criminal careers before, during, and after gang membership is possible due to major data collection efforts, but also due to the high visibility and less secretive nature of street gang activity. These groups are by definition street-oriented, making them visible but also different than other, less visible, criminal groups (Decker & Pyrooz, 2015).

This is entirely different for organized crime groups, including mafia groups. Individuals involved in organized crime groups are much less accessible and the identification of the recruitment into and desistance from the groups is often challenging (Calderoni et al., 2022). Empirical research into such groups is more difficult, and therefore much scarcer (Reuter & Tonry, 2020). Over the last decades, however, interesting criminal career research has emerged in this area, e.g. in several European countries, Canada, and Australia (see, for a review, Kleemans & van Koppen, 2020). One of these studies compared the entire criminal careers of organized crime offenders in Italy and the Netherlands and found important differences between these offenders (Calderoni et al., 2024). Offenders in Italy exhibited higher offending, earlier violence, earlier onset and decline, while offenders in the Netherlands displayed later onset, slower decline, and a greater involvement on drug and property offenses. The study also found substantial variation across offenders born in different decades of birth, with younger offenders in both countries reporting higher frequencies.

These differences, however, may also be due to competing selection, facilitation, and enhancement processes, whose examination may provide insights into the relation between offending and organized crime in a longitudinal and life-course perspective. For instance, research on Outlaw Motorcycle Gangs (OMCGs) highlighted both selection and enhancement effects associated with adult OMCG membership and its impact on criminal behavior. In terms of selection effects, OMCG members were found three times more likely to have an adolescent conviction history, compared to non-members (Blokland, van Hout, van der Leest, & Soudijn, 2019). Together with selection, an enhancement effect is also present, as criminal behavior increases after individuals join the most criminal OMCGs, with enhancement being particularly strong for drug crimes (Van Deuren, Blokland, & Kleemans, 2021).

The first objective of this study, therefore, is to investigate whether organized crime offenders in Italy and the Netherlands exhibit divergent criminal behaviors during their early criminal careers (up to age 23 and 30) and compare whether such differences are consistent with those exhibited throughout their entire criminal careers (i.e. no maximum age). Previous research indicates that organized crime involvement often does not occur during adolescence but during adulthood (Calderoni et al., 2022; Kleemans & van Koppen, 2020; Van Koppen, Vere, Poot, & Blokland, 2010). By focusing on the early career, we aim to shed light on potential variations in offending patterns before the involvement in criminal organizations and possible processes of selection, facilitation, or enhancement. Assessing these processes typically requires longitudinal studies that include both a treatment group (individuals involved in organized crime) and a control group (individuals not involved in organized crime). Unfortunately, we could not obtain detailed information on control groups for both countries. However, comparing the early careers with the entire criminal careers analyzed in the previous study (Calderoni et al., 2024) can still provide valuable insights, particularly in cross-country comparisons. If the differences observed in the prior study are also present in the early careers, this could indicate distinct selection processes, where individuals destined for organized crime in the two countries already exhibit different criminal behaviors at a young age. Conversely, if the early careers fail to exhibit the same differences, this could suggest enhancement or facilitation processes. With this objective, we aim to answer the following research questions: Do organized crime offenders in Italy and the Netherlands differ in their criminal behaviors at an early age? If so, are these differences consistent with the difference throughout the entire criminal careers reported by Calderoni and colleagues (2024)? Is there evidence of selection and/or enhancement processes?

The second objective of this study focuses on the differences among generations, as different generations are confronted with different situational contexts. Our previous study on the differences between organized crime offenders in Italy and the Netherlands provided preliminary evidence that there are substantial differences between offenders born in different decades (Calderoni et al., 2024). These

differences could be due to three different theoretically relevant mechanisms.

First, organized crime offenders may have changed over time and have become more violent and dangerous. This 'generational shift' interpretation was supported by research into members of Outlaw Motorcycle Gangs (OMCGs), a specific group of offenders that is closely connected to organized crime activities in some countries, such as Australia, Canada, and some European countries. Van Deuren and colleagues also reported higher offending for Dutch OMCG members who joined in more recent years, but noted that differences vanished when controlling for age (2022). A study by Voce and colleagues on the offending trajectories of Australian members of OMCGs between age 12 and 24 showed that the cohort born in 1989–1993 committed more crime in early adulthood than cohorts born in 1979–1983 and 1984–1988 (2021). Yet, the study did not account for the age of entry into gangs due to lack of data. Furthermore, the study included individuals in the police intelligence dataset on OMCG in 2019. Older individuals had a longer period for being identified by the police and this may have included late-onset offenders with no or very limited criminal career up to age 24. Conversely, younger individuals detected by the police were more likely to include early onset, prolific offenders.

Second, the context around organized crime offenders may be time-specific, and therefore have a different effect on different cohorts of offenders. This context may have changed due to social change in general and particularly more intensive law enforcement actions against drug trafficking and organized crime over time. Recent research in life course and developmental criminology recognizes that socio-historical changes may have an important influence on the criminal careers of individuals in addition to individual characteristics. For example, Neil and Sampson reported substantial differences in the risk of arrest between individuals born in the mid-1980s and in the mid-1990s, even after controlling for a wide array of environmental, family, and individual risk factors. They argued that these differences were to be attributed to social change and particularly to the changes in the crime trends and the response by the criminal justice system over time (Neil & Sampson, 2021). Also, Payne and Piquero found substantial differences between a 1984 and a 1995 cohort in New South Wales (Payne & Piquero, 2020). This mechanism indicates that different cohorts aging in different socio-historical periods will result in substantially different offending patterns, all other things equal. In other words, 'when we are' might matter as much as, if not more than, 'who we are'. (Neil & Sampson, 2021; Neil, Sampson, & Nagin, 2021; Piquero, 2023:7; Sampson and Smith 2021). While this research reported that changes in the criminal justice system caused less arrest or offending, Italy and the Netherlands have substantially expanded their anti-organized crime and anti-drug trafficking policies since the 1980s and the 1990s.

Third, the differences among individuals born in different decades may be due to a selection bias in the previous study. The sample included offenders with at least one lifetime conviction for organized crime offenses. Clearly, more recent decades include only offenders who committed an organized crime offense at a relatively early age, which creates bias towards more prolific, high-frequency offenders. Conversely, for example, the observation period for offenders born in the 1950s was longer, leaving more time for an organized crime conviction to occur and potentially encompassing also late starters and low frequency offenders. Also the study by Voce, Morgan, and Dowling (2021) presents a similar potential bias. In other words, the greater seriousness or higher offending frequency among offenders born in more recent decades may be just due to a sampling bias. It is essential to properly control for this potential bias to properly assess the impact of the two above-mentioned mechanisms.

To achieve the second objective of this study, we examine the evolution of early-stage criminal careers in organized crime across various decades, considering generational and societal influences while controlling selection bias. We address the following research questions: *Are there differences in the early criminal career of organized crime offenders born in different decades? If yes, are these differences due to a generational shift or to broader social changes including more intensive law enforcement?*

The focus on the same age period across decades enables us to distinguish between two different exploratory hypotheses. First, we hypothesize that the generational shift would show that offenders born in more recent decades would report an earlier age of onset, a greater number of crimes, higher frequency, higher offending seriousness, and a greater number of violent convictions during adolescence and early adulthood (Van Deuren, Blokland, & Kleemans, 2021). Second, we hypothesize that more intensive law enforcement action would manifest itself with a higher number of organized crime and drug convictions, especially if indicators of more intensive, serious, or violent offending are constant.

3. Methodology

3.1. Data

The initial sample derived from a previous analysis of the criminal of 4480 convicted male organized crime offenders in Italy ($n = 3360$) and the Netherlands ($n = 1120$) (Calderoni et al., 2024). The dataset included all lifetime criminal convictions, for any crime and with information on the date and type of offense, of individuals convicted at least one in their lifetime for organized crime offenses.

The Dutch sample originated from the Organized Crime Monitor (OCM), an ongoing research project analyzing a selection of 150 cases (for data collection wave 1 to 4) from all closed criminal investigations into organized crime (for more information, see: Kruisbergen, van de Bunt, & E. R: Kleemans., 2012; Kleemans, 2015; Kruisbergen, Roks, & Kleemans, 2019). Individuals in the Dutch sample were included if involved in major organized crime investigations.[1] These focused on a range of different conducts including drug trafficking, synthetic drug production, human smuggling and trafficking, money laundering.

The Italian sample originated from the larger Proton Mafia Member dataset (hereinafter PMM), recording the criminal careers of 11,138 offenders convicted in Italy at least once between 1982 and 2016 for the offense of mafia association, provided by Article 416-bis of the Italian Criminal Code(Campedelli, Calderoni, Comunale, & Meneghini, 2021; Meneghini, Campedelli, Calderoni, & Comunale, 2021; Savona et al., 2020).[2] The Italian sample was drawn from the PMM data set to ensure comparability with the Dutch sample by sex and decade of birth. The initial sample comprised individuals born across more than fifty years, namely between 1933 and 1986.

We divided the sample into five groups based on their birth decade. Due to the smaller numbers, individuals born earlier than 1950 entered one category (<50s) and the last category (80s) only comprises individuals born up to 1986, the youngest individuals in the initial sample. We argue this division is suitable because of the relatively small size of

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[1] Following the Fijnaut research group (Fijnaut, Bovenkerk, Bruinsma, & Van De Bunt, 1998), groups are considered to be organized crime groups if they are focused primarily on obtaining illegal profits, if they systematically commit crimes which cause serious damage to society and if they are fairly competent in shielding their criminal activities from the authorities. Shielding illegal activities from the authorities is made possible by using various strategies such as: corruption, violence, intimidation, storefronts, communication in codes, counter surveillance, media manipulation and the use of experts such as public notaries, lawyers, and accountants.

[2] Article 416-bis paragraph 3 of the Italian Criminal Code states that "The association is of a mafia-type when those who are part of it use the force of intimidation derived from the associative bond and the resulting state of subjugation and silence to commit crimes, to directly or indirectly acquire the management or control of economic activities, concessions, authorizations, public contracts, and services, or to achieve unjust profits or advantages for themselves or others, or to impede or obstruct the free exercise of voting rights or to obtain votes for themselves or others during elections."

the samples, especially when looking at the early criminal career across time. Additionally, the decades are distinct enough to capture generational differences in offending patterns over an extended period, while keeping the number of groups manageable for a clear presentation of the findings (for a similarly broad classification, see Bersani, Laub, & Nieuwbeerta, 2009). We acknowledge, however, that individuals born in the same decade may still exhibit important differences. We suggest that future research could further disaggregate the samples into cohorts to gauge more homogeneous groups and obtain more specific results. Yet, exploration of cohort differences or even birth year differences in the largest Italian sample resulted in patterns consistent with the results by decade. Furthermore, the prior research reviewed above focused only on two or three cohorts, with an implicit potential bias on cohort selection and a restriction of the periods analyzed.

We do not pretend that the two samples are identical. In fact, we acknowledge that they have substantial differences, chiefly because the concept of organized crime and the criminal justice policies in Italy and the Netherland are also different. However, we also note that the two samples effectively represent the typical manifestations of organized crime in each country: the mafias dominate the discussions on organized crime in Italy, whereas the participation in illicit traffics and 'transit crime' is the typical form of organized crime in the Netherlands (Calderoni et al., 2024). They reflect the social and criminal justice construction of organized crime among the public, policymakers, and governments in both countries.

From the initial sample, we focused on the early criminal career to prevent selection bias across different decades of birth due to different observation periods and to investigate offending patterns occurring before joining criminal organizations. Prior research showed that involvement in organized crime often occurs later in life (Calderoni et al., 2022; Kleemans & van Koppen, 2020; Van Koppen, Vere, Poot, & Blokland, 2010). In the initial sample, the average age at organized crime involvement was around age 35 (Calderoni et al., 2024).

We thus identified individuals with at least one criminal conviction before several age thresholds, independently from involvement in or convictions for organized crime. During preliminary exploration we examined the prevalence of convictions before age 21, 23, 25, 27, and 30 across the decades of birth (Fig. 1 and Appendix Table 1). We excluded individuals born before 1950 as they reported low prevalence across all thresholds, especially in the Dutch sample.

We selected two distinct age thresholds to account for different developmental patterns during youth and young adulthood. The first comprises convictions up to age 23, thus focusing on an early stage of the criminal career, as the minimum age for criminal liability is 14 in Italy and 12 in the Netherlands, and likely before organized crime involvement for most of the sample. However, this threshold included barely half of the initial sample due to the lower prevalence among the older individuals and in the Dutch sample. By also analyzing convictions up to age 30, we encompassed a longer period including young adulthood, the first years of organized crime involvement for some individuals, and we also controlled for possible biases due the low offending prevalence before age 23.

In conclusion, from our initial sample we extracted two samples of offenders born between 1950 and 1986. The first included 2141 individuals (1739 in Italy, 402 in the Netherlands) who received at least one criminal conviction before age 23. The second comprised 3092 individuals (2439 in Italy, 653 in the Netherlands) with at least one conviction before age 30. We emphasize that during the time considered in the samples only a few individuals may be involved in organized crime. All individuals, however, received at least one conviction for organized crime during their lifetime. In the rest of the paper, we use 'offenses' or 'convictions' interchangeably to refer to the criminal activities in our dataset to avoid repetition and ensure fluidity of the narrative.

3.2. Measures

For both age thresholds, we computed criminal career parameters at the individual level. We counted the number of convictions before the age threshold and identified the age at first crime. We computed criminal career duration as the difference in years between the year of the last (within the age threshold) and the first crime (Piquero, Brame, & Lynam, 2004; Piquero, Paternoster, Mazerolle, Brame, & Dean, 1999; Weisburd & Waring, 2001). We measured specialization through the diversity index, which ranges between 0 (when all convictions fall within the same category) and 1 when they are equally distributed across all categories (Lussier, McCuish, Deslauriers-Varin, & Corrado, 2017; Piquero et al., 1999; Sullivan, McGloin, Pratt, & Piquero, 2006; Wright, Pratt, & DeLisi, 2008).[3] The ratio between the total convictions and the duration generated the frequency (also known as lambda). Lastly, we computed a seriousness score.

The elaboration of the seriousness score was more challenging due to the different nature of the two country samples. For the Italian data, we relied on offense-level seriousness scores based on the average statutory penalty in months of imprisonment and computed the average seriousness at the individual level. In this calculation, we have chosen to exclude the seriousness of the mafia association offense and the drug trafficking association offense due to the bias they would have introduced across decades. These offenses were introduced in 1982 and 1990, respectively, which means that individuals born in earlier decades could not have been convicted for them during their youth. By excluding these offenses, we also mitigate potential bias in the seriousness score due to period-related variations in convictions caused by the introduction of these offenses. For the Dutch data, we lacked similar offense-level information but relied on the total number of conditional and unconditional days of imprisonment imposed upon each offender at different ages. We computed the sum of conditional and unconditional days as a proxy of the average offending seriousness at the individual level. To obtain comparable seriousness measures between the two country samples, we applied a k-median clustering algorithm to the seriousness score, which clustered the individuals in each country in 100 seriousness levels, where 1 corresponds to the lowest seriousness and 100 to the highest seriousness (Song & Zhong, 2020; Wang & Song, 2011).[4]

We classified all offenses into seven crime categories drawn from the Dutch standard classification of offenses (CBS, 2010). The categories comprise: drugs, misdemeanors, organized crime (mafia association for the offenders in Italy and the criterion offense for the offenders in the

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[3] The formula for the diversity index is $DI_i = 1 - \sum_{m=1}^{7} p_m^i * p_m^i$, where m is a crime category, p_m^i is the proportion of convictions of category m out of total convictions by individual i. The actual range of the index depends on the number of categories and, for 7 categories, is 0–0.85. Since the number of committed crimes affects the calculation of the diversity index, we adopted the correction suggested by the literature (Francis & Humphreys, 2016; Fuller, Morgan, & Brown, 2019; Morgan & Payne, 2021). The index is unavailable for offenders that committed one crime.

[4] K-median clustering partitions a set of one-dimensional data points into k clusters based on their proximity to each other by minimizing the total distance between data points and their corresponding cluster centers, known as medians. The algorithm starts by randomly selecting k initial cluster centers from the data points. Then, it iteratively assigns each data point to the cluster center that is closest in terms of the Euclidean distance along the one-dimensional axis. After assigning all data points to clusters, the algorithm recalculates the median for each cluster, which is the data point with the minimum total distance to all other data points in that cluster. The process of assigning data points to clusters and recalculating medians is repeated until convergence, which occurs when the cluster assignments and medians no longer change significantly between iterations or when a predefined number of iterations is reached. Once the algorithm converges, the result is a set of k clusters, where each cluster contains data points that are close to the corresponding cluster center (median) along the one-dimensional axis.
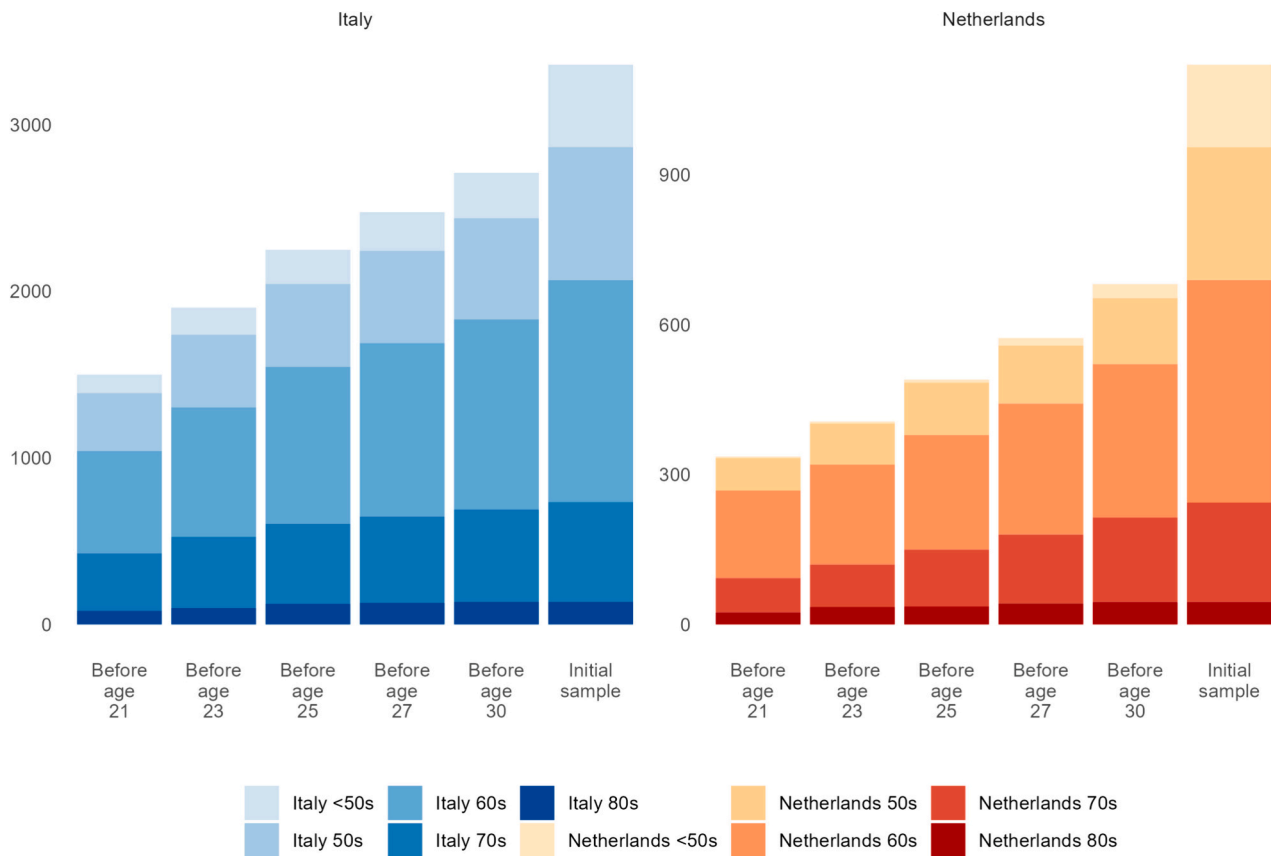
Fig. 1. Count of Individuals With at Least 1 Conviction by Country, Age Threshold, and Decade of Birth.

Netherlands), property (comprising theft, fencing, false documentation and forgery, damages to property), violent (murder, assault, extortion, robbery, threats), weapons, and other offenses (residual category).

3.3. Analytical strategy

To achieve the first objective (compare early criminal careers of organized crime offenders in Italy and the Netherlands), we compared the distributions of the criminal career parameters and crime categories between the Italian and Dutch samples through the non-parametric two-sample Mann-Whitney *U* test.

To achieve the second objective (assess the evolution of criminal careers over distinct decades, while assessing the potential effects of generational and societal changes), we first compared the within-country distributions across different decades of birth relying on non-parametric Kruskall-Wallis rank-sum tests. We explored the differences between pairs of decades through the Wilcoxon Rank Sum Tests.

Second, to control possible confounders, we opted for multinomial logistic regressions. They extend traditional logistic regression by modelling the relationship between multiple categorical outcomes and a set of predictor variables. Operationally, the coefficients represent the impact of a unitary increase in each predictor variable on the odds of belonging to a specific outcome category relative to the reference category. To address potential issues arising from data separation (Cook, Hays, & Franzese, 2020), where certain crime categories had zero convictions in specific birth decades (e.g., no organized crime convictions for offenders in the Netherlands born in the 1950s, as shown in Appendix Table 3), we applied a regression fitting method using adjusted score functions to reduce separation biases (Kosmidis, Pagui, Konis, & Sartori, 2023; Kosmidis, Pagui, & Sartori, 2020).

The dependent variable was the decade of birth. We opted to keep individuals born in the 80s as the reference category to facilitate the

interpretation of the results as a change in the odds of being born in one other decade compared to the probability of being born in the 80s. By exponentiating coefficients we obtained relative risk ratios, which can be interpreted similarly to odds ratios. For both country samples and both age thresholds, we ran two main models. The first model included criminal career parameters as independent variables,[5] while the second extended model also included the crime categories while removing the total number of crimes due to collinearity with crime categories.[6] We ran several additional models and specifications, which generally confirmed the main models (not reported for brevity).[7]

Third, we tested the robustness of the results by performing OLS regressions for both country samples and age thresholds. The dependent variables were the seriousness and the frequency due to the relevance of these variables to assess possible generational shifts among organized

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[5] To prevent numerical instability and problems due to missing data, we excluded the Diversity Index from all the regressions. Furthermore, we recalculated the frequency as number of crimes/(duration $+1$). With this, we treated the missing frequencies for offenders who committed one or more crimes in a single year. We employed this frequency measure only for the regression models, while we presented the canonical frequency in the descriptive analyses and figures.

[6] We also excluded the "other" crime category from the multinomial logistic regressions to prevent numerical instability.

[7] Additional unreported models were examined, including those combining individuals born in the 1970s and 1980s and excluding duration. For the Dutch sample, variations also involved removing individuals born in the 1950s and implementing logistic regression models pooling those born in the 1950s with the 1960s, and those born in the 1970s with the 1980s. In the Italian samples, models also incorporated seriousness measures covering both mafia association and drug trafficking association offenses. Detailed results are available upon reasonable request to the corresponding author.

crime offenders and due to the results of the descriptive analyses. For each country and age threshold, we ran three models. The first models included only the decade of birth as a categorical dependent variable, with being born in the 80s as the reference category. Subsequently, we included the criminal career parameters. Lastly, the most complete models also included the crime categories while removing the total number of committed crimes.

4. Results

Regarding the first objective (assessing whether the differences observed among organized crime offenders in Italy and the Netherlands across their entire criminal careers are present at an early age), the distributions of the criminal career parameters are generally different between the Italian and Dutch samples, according to a non-parametric Mann-Whitney *U* Test (Fig. 2, Appendix Table 2). The differences are also consistent with the evidence from the entire criminal career: offenders in Italy showed a greater number of crimes, higher frequency, seriousness, and a larger share of violent and weapon-related offenses. Offenders in the Netherlands reported a greater proportion of property offenses. The age at first crime is lower for the offenders in the Netherlands before age 23, yet the difference becomes non-significant when considering the criminal career up to age 30. This may be due to the lower age of criminal liability in the Netherlands (age 12 versus age 14 in Italy), which also explains the differences in duration before age 23 and before age 30. At the same time, we note that the number of drug offenses is similar before age 23 (non-significant difference) and only slightly greater for offenders in the Netherlands before age 30.

Regarding the second objective (the differences among individuals born in different decades), for the criminal career parameters (Fig. 3), younger generations of offenders in Italy (born in recent decades; i.e. the 1980s and in the 1970s) reported a greater number of total convictions, a higher seriousness and a lower age at first crime than the older individuals (born in the 1950s and 1960s). Younger generations of

offenders in the Netherlands showed higher frequency and seriousness with a lower total of convictions and shorter duration. Turning to crime categories (Fig. 4), younger generations of organized crime offenders in Italy showed an increase of drug and organized crime convictions and a decrease of property and weapons convictions; they also reported an increase of violent crimes, although the differences decreased at the age 30 threshold. Younger generations of offenders in the Netherlands reported more misdemeanors, drug, and organized crime convictions, and less property and violent offenses.

Kruskall-Wallis tests of differences reported mostly statistically significant differences across decades of birth for both countries and age thresholds (Appendix Table 3 and Appendix Table 4). For both samples, the largest differences concerned the number of organized crime convictions, drug convictions, and seriousness, all reporting higher values for the younger individuals in the samples. Results of pairwise Wilcoxon Rank Sum Tests showed that: the number of organized crime convictions were statistically different across all decades and for both age thresholds and countries; that the number of drug convictions were statistically different for both age thresholds and countries, with the main exception of individuals born in the 1970s and 1980s; that seriousness scores showed statistically significant differences between individuals born in the 50s and all other decades in Italy, while in the Netherlands the differences concerned comparisons with the youngest decade of birth (for a summary visualization of the results of the post hoc tests, see Appendix Fig. 1).

The multinomial logistic regressions assessed the probability of individuals being born in the 1950s, 1960s, or 1970s compared to individuals born in the 1980s (the comparison decade). By this strategy, we aimed to identify criminal career parameters discriminating between decades of birth and thus suggesting substantial differences in the offending patterns, controlling for confounding factors.

In the Italian sample, models including only the criminal career parameters (models 1 and 3 in Table 1) indicated that, compared to the probability of being in the reference category (1980s), the average
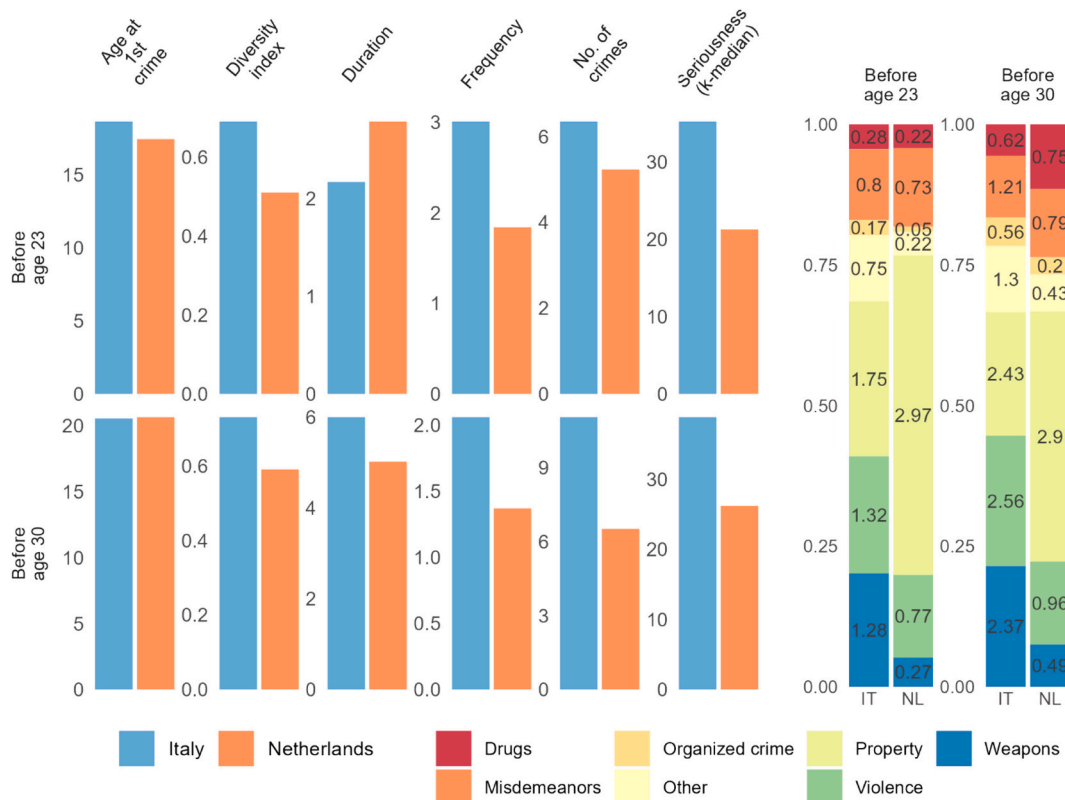

Fig. 2. Average Criminal Career Parameters and Crime Categories by Country and Age Threshold.
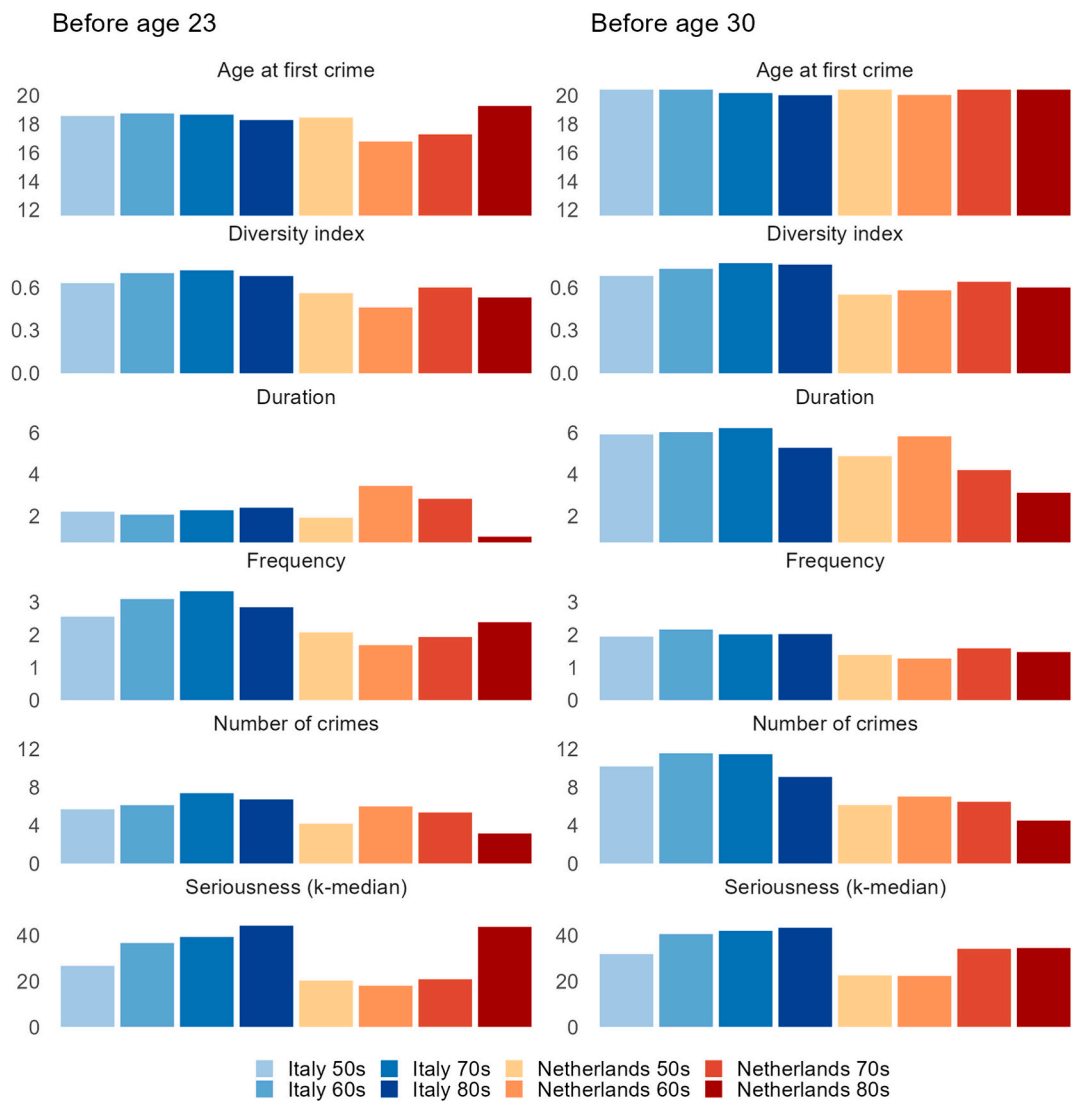
Fig. 3. Average Criminal Career Parameters by Age Threshold, Country, and Decade of Birth.

seriousness was negatively correlated with the probability of being born in the 1950s and 1960s but not in the 1970s. This means that older-generation organized crime offenders were convicted for less serious crime before age 23, compared to individuals born in the 1980s. In the model before age 30 (model 3), the age at first crime and the duration were associated with a greater probability of being born in any of the earlier decades, compared to the 1980s. Models also including the crime categories (models 2 and 4 in Table 1) showed a better fit to the data (lower AIC and BIC, higher log likelihood). In these models, seriousness lost statistical significance, the number of organized crime convictions reported a strong association with the probability of being born in the first three decades, with decreasing intensity. The number of drug convictions and violence convictions were negatively correlated with the probability of being born in the 1950s and 1960s, but it did not distinguish between 1970s and the 1980s.

In the Dutch sample, models with only criminal career parameters (models 1 and 3 in Table 2) also showed that, compared to the probability of being born in the 1980s, seriousness was negatively associated with being born in the earlier decades. Similarly, the frequency was negatively correlated with the probability of being born in the 1950s and 1960s. Lastly, a higher age at first crime was associated with greater odds of being born before 1980 in the sample before age 30. After the inclusion of crime categories (models 2 and 4, reporting a better fit to the

data), the frequency lost statistical significance. The seriousness remained significant for the 60s vs. 80s and 70s vs. 80s comparisons in the sample before age 23, and for the 60s vs 80s comparison in the sample before age 30. In the sample before age 23, only property convictions reported a positive association with the probability of being born in any decade other than the 1980s. In the sample before age 30, organized crime convictions were negatively associated with the probability of being born in the 1950s, similarly to drug convictions with the probability of being born in the 1950s and 1960s; property offenses reported again a positive correlation with the probability of being born in any decade earlier than the 1980s.

We note however that, for Model 2 of the Dutch sample, individuals born in both the 1950s and 1960s reported 0 convictions for organized crime.[8] While our regression fitting methods could handle separation for one category, in this case the models did not report statistically significant coefficients for organized crime. Second, the sample was small, especially for the offenders born in the 1980s ($n = 35$) and the models may be overfit. We have addressed these concerns with several additional, more parsimonious unreported model. More specifically, when

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[8] These offenders will receive their first organized crime conviction later in life. They are in the Dutch sample because they have committed at least one crime before 23.
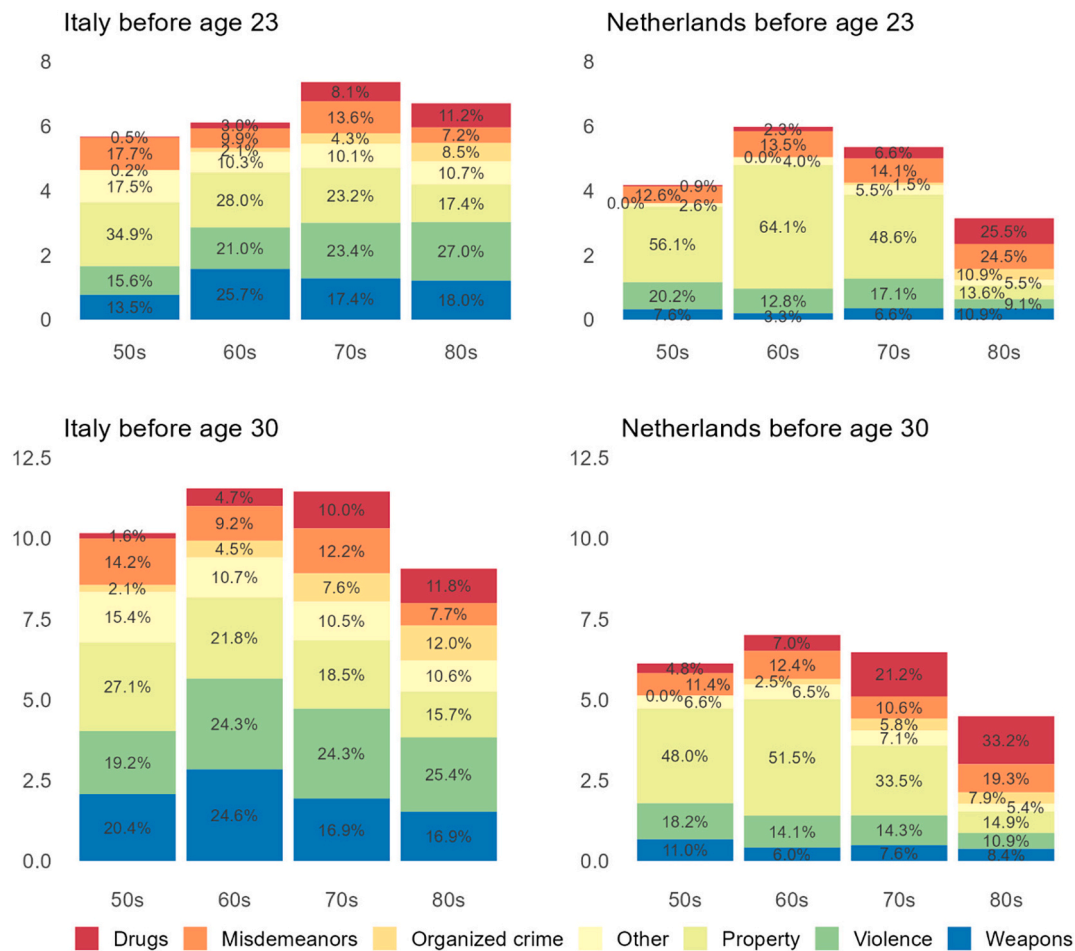
Fig. 4. Crime Categories by Country, Age Threshold, and Decade of Birth.
Note: The column height and the y axis report the average number of convictions per category among offenders born in the same decade. The labels report each category share out of total convictions.

Table 1
Results of multinomial logistic regression on the decade of birth. italian sample by age threshold. reference category = born in the 1980s. odds ratios

	Before age 23						Before age 30					
	Model 1			Model 2			Model 3			Model 4		
	50s	60s	70s	50s	60s	70s	50s	60s	70s	50s	60s	70s
Criminal career parameters												
No. of crimes	1	0.99	1.04				1.04	1.03	1.02			
Age at 1st crime	1.06	1.13	1.17	1.10	1.14	1.17	1.21***	1.29***	1.18***	1.28***	1.36***	1.21***
Frequency	0.98	1.04	0.91	0.96	0.94	0.90	0.91	0.96	1	0.96	1	1.01
Seriousness	0.97***	0.99*	0.99	0.99	1	1	0.97***	0.99*	0.99	0.99	1	1
Duration	1.01	1.01	0.97	1.15	1.07	0.97	1.10*	1.16***	1.12*	1.19***	1.23***	1.13***
Crime categories												
Organized crime				0.03***	0.17***	0.55*				0.08***	0.23***	0.6***
Drugs				0.13***	0.58***	0.99				0.47***	0.80***	0.97
Misdemeanors				1.30*	1.03	1.38*				1.26*	1.12	1.23*
Violence				0.8***	0.84***	0.95				0.92*	0.93*	0.98
Property				1.16	1.15	1.12				1.18***	1.16*	1.09
Weapons				1.15	1.38***	1.11				1.33***	1.32***	1.08
(Intercept)	0.80	0.97	0.47	1.62	1.07	0.26	0.12*	0.02***	0.09*	0.03***	0.01***	0.04***
No. Obs.	1631			1631			2314			2314		
Log likelihood	−1917			−1731			−2699			−2392		
AIC	3870			3529			5435			4849		
BIC	3967			3707			5538			5039		

*p < 0.05; **p < 0.01; ***p < 0.001

Table 2
Results of Multinomial Logistic Regression on the Decade of Birth. Dutch Sample by Age Threshold. Reference Category = Born in the 1980s. Odds Ratios.

	Before age 23						Before age 30					
	Model 1			Model 2			Model 3			Model 4		
	50s	60s	70s	50s	60s	70s	50s	60s	70s	50s	60s	70s
Criminal career parameters												
No. of crimes	1.6*	1.64*	1.49*				1.21***	1.17*	1.14			
Age at 1st crime	1.08	0.92	0.93	1.08	0.94	0.93	1.25***	1.19***	1.17***	1.32***	1.24***	1.17***
Frequency	0.45*	0.4*	0.7	0.68	0.6	0.87	0.42***	0.62***	0.82	0.71	0.77	0.88
Seriousness	0.97***	0.96***	0.97***	0.99	0.98*	0.97*	0.97***	0.97***	0.99	0.99	0.98*	0.99
Duration	0.85	0.95	1	0.93	1.06	1.06	1.04	1.11	1.04	1.17	1.19*	1.05
Crime categories												
Organized crime				0.09	0.06	1.53				0.01***	0.66	1.29
Drugs				0.34	0.85	1.1				0.48***	0.65***	0.96
Misdemeanors				0.91	1.08	0.97				0.67*	0.74	0.76
Violence				1.48	1.26	1.48				1.21	1.12	1.19
Property				1.79*	1.86*	1.67*				1.45***	1.48***	1.41*
Weapons				1.14	0.81	1.11				1.42	1	1.02
(Intercept)	1.31	47.57	11.38	0.88	26.15	9.05	0.05*	0.21	0.11	0.01***	0.09*	0.11
No. Obs.	402			402			653			653		
Log likelihood	−435			−407			−740			−670		
AIC	907			881			1515			1406		
BIC	979			1013			1596			1554		

[1] *p < 0.05; **p < 0.01; ***p < 0.001

pooling offenders born in the 1970s and 1980s into one category, the specification of Model 2 reported statistically significant results for organized crime, with a negative association with the probability of being born in the 1950s and 1960s compared to being born in the pooled 1970–80s category.[9]

To test the robustness of our findings, we run several OLS regressions. The results generally confirmed the results of the multinomial regressions (Appendix Table 5 and Appendix Table 6). For the Italian sample, they showed that the decade of birth had limited effect on the estimated seriousness and frequency, especially once the crime categories were included in the models. For the Dutch sample, the decade of birth maintained a statistically significant and negative effect on the level of seriousness, even when including the crime categories for the sample before age 23. In the sample before age 30, only being born in the 1960s (vs the reference category 1980s) generated a statistically significant and negative impact on the seriousness. Also, while the decade of birth had no statistically significant effect on the frequency once controlling for the crime categories in the sample before age 23, being born in the 1950s and 1960s resulted in a decrease in the expected frequency versus being born in the 1980s in the sample before age 30.

5. Discussion and conclusions

5.1. Early career differences between organized crime offenders in italy and the netherlands

Regarding our first objective, we found that most differences between the two country samples were already observable from a young age: during the analyzed periods, offenders in Italy reported more convictions overall, more violence and weapon convictions, and higher frequency; offenders in the Netherlands reported higher property convictions. Conversely, the two samples lack substantial differences in the number of drug convictions before age 23 (Italy 4.7 %, the Netherlands 3.8 %, n.s.) but exhibit a statistically significant difference only in the sample before age 30 (5.4 % and 10.7 %, respectively, *p* = 0.003). This finding contrasts with the remarkable differences across in the entire criminal careers reported in the previous study, where drug convictions accounted for 6.7 % and 21.2 % of crimes in Italy and the Netherlands,

respectively (Calderoni et al., 2024:704).

These early distinctions may point to different criminal careers pathways between the two countries, often predating actual involvement in organized crime groups. Simultaneously, these differences result, to some extent, from the distinct concepts, definitions, and activities commonly associated with organized crime groups in Italy and the Netherlands: 'illegal governance' in Italy and 'trading' in the Netherlands (Breuer & Varese, 2023; Campana & Varese, 2018; Kleemans, 2007). However, the smaller proportion and minimal variation in drug convictions, when compared to entire criminal careers examined in Calderoni et al. (2024), suggest that involvement in this illicit trade may emerge in the late 20s or later in life, potentially following integration into organized crime networks – particularly in the Dutch organized crime landscape (Van Deuren, Blokland, & Kleemans, 2021; Van Der Geest, Victor, Koppen, & Kleemans, 2020; Van Koppen, & Vere, and Christianne J. de Poot, 2013). More generally, the results are consistent with research indicating that the social opportunity structure for (international) drug trafficking increases with age, as it requires specific social relationships, (international) collaboration, and more complex logistics than street crime. Not every offender has suitable social ties for these illicit activities, and building up these relationships takes time and energy (Kleemans & van Koppen, 2020). A study by Pennings, Bruinsma, and Weerman (2006) on 2565 23-year-old known offenders in Amsterdam showed that less than 1 % of this group was involved in organized crime offenses (broadly defined and including local drugs distribution and small-scale cannabis smuggling). Other studies showed an increasing involvement of offenders in organized crime activities, including drug trafficking, towards the late 20s (Kleemans & de Poot, 2008). The differences in the social opportunity structure to engage in drugs trafficking in the Netherlands compared to Italy may only start to appear in the differences we reported before age 30 whereas they are absent before age 23. And they would fully manifest their impact on the entire criminal careers as reported in Calderoni et al. (2024). As showed in Fig. 1, a substantial part of the of the initial Dutch sample consisted of late-onset offenders, with their first conviction from age 30 and involvement in organized crime at even later ages.

Overall, the differences between the early criminal careers of future organized crime offenders in Italy and the Netherlands may indicate both selection and enhancement processes: offenders with a specific criminal career pathway may eventually be involved in organized crime groups; once involved, they would further persist in offending as well as

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[9] Results not reported for brevity. Available upon request to the authors.

intensify specific crimes, such as drug trafficking. While established for street gang research, selection and enhancement processes were scarcely researched for organized crime groups with only a few studies on OMCGs exploring these mechanisms (Blokland et al., 2019; Klement, 2016; Pedersen, 2018; Van Deuren, Blokland, & Kleemans, 2021). We contribute to this research by exploring the validity of these mechanisms also for understanding the relationship between offending and involvement in the Italian mafias and in Dutch organized crime. Nevertheless, we acknowledge that a classic test of selection processes would require a longitudinal, treatment and control group, frame which was unavailable for our study. We thus relied on comparing different periods of the criminal careers of offenders in the two samples to derive indications about changes and or stability in their offending. We acknowledge, however, that the absence of comparison groups limits the external validity of our results, and we hope that future research will be able to compare organized crime offenders with general offender samples.

5.2. Differences among offenders born in different decades

Regarding the second objective, we found several differences among individuals born in different decades.

First, we found scarce support for the generational shift hypothesis. Younger offenders in both countries displayed higher seriousness in initial analyses, but unclear patterns emerged for other indicators like number of total convictions, frequency, onset age, or violence convictions. When multinomial regressions accounted for potential confounding effects, the differences in seriousness partially subsided. In Italy, seriousness became statistically insignificant, with 1980s-born offenders showing more violence than those born in the 1950s and 1960s, but not the 1970s. In the Dutch sample, offenders born in the 1980s reported higher seriousness only compared to those born in the 1960s. Prior studies on outlaw motorcycle gangs in the Netherlands and Australia found that younger members engaged in more offending (Van Deuren, Blokland, & Kleemans, 2022; Voce et al., 2021). However, the differences reported by van Deuren and colleagues disappeared when controlling for age. The study by Voce and colleagues may have included late-onset offenders, i.e. individuals with no offending record up to age 24, in the older cohorts. This selection may bias the aggregate levels of offending across three cohorts. Our analyses, controlling for selection bias and considering various career parameters up to age 30, suggests weak support for a generational shift towards more serious and dangerous offending among organized crime offenders in Italy and the Netherlands. While this generational shift might be present among OMCGs and not in organized crime groups, further research, specifically considering age differences and criminal group involvement, is essential.

Second, we found stronger support for the social change hypothesis. In the descriptive analyses across countries and age thresholds, more recently born offenders consistently reported more convictions for organized crime and drug offenses, both in absolute and relative frequencies. These patterns persisted also in the regression analyses, notably among younger offenders in Italy who were significantly more likely to have convictions for organized crime and drug-related offenses compared to their older counterparts, with all other variables held constant. While the models for the Dutch sample encountered convergence difficulties, likely due to fewer observations, results before age 30 indicated that younger generation offenders were more likely to receive convictions for drug offenses. Regarding organized crime convictions, no offender in the Netherlands born in the 1950s had ever been convicted for an organized crime offense before age 30, and similarly, no offender born up to the end of the 1960s had faced organized crime convictions before age 23. Although this separation posed challenges in model convergence, it also underscores the near-absence of early-age organized crime convictions among older offenders in the Dutch sample.

We interpret these findings as indications that offenders born in different decades encountered distinct social, technological, and economic conditions, significantly influencing their criminal careers. In particular, we emphasize two major developments: first, the increasing opportunities to engage in the drug trade in the last decades of the twentieth century, not only due to greater consumption, but also due to the improvements of communications, transports, and technologies allowing local production (Boivin, 2014; Storti, & Cláudia, and Paul De Grauwe., 2009). Second, the change of the criminal justice systems, and particularly the stricter anti-drug trafficking and organized crime policies introduced in the 1980s and 1990s, following the concerns regarding increased drug consumption, the expansion of international drug trafficking, domestic drug production, and various forms of organized crime.

For example, Italy introduced the mafia association offense in 1982. In the following decades, it progressively created an extensive, harsher anti-mafia system (La Spina, 2008). Individuals born in the 1950s, aged between 23 and 32 in 1982, may have felt the impact of this new offense only later in their adulthood, possibly beyond the age range considered in this study. In contrast, those born later grew up when the mafia association offense was already established and actively used by Italian authorities. Italy also intensified the enforcement of drug laws towards the end of the century. In 1975, the rate of drug-related offenses reported in Italy was only 2.1 per 100,000. By 1985, this had increased tenfold to 21.9, and by 1995, it soared to 67.3 (Istat, 2023). This dramatic rise suggests that young Italians in the 1970s were far less likely to be convicted for drug offenses compared to their counterparts in the 1990s, undoubtedly influencing the criminal trajectories of organized crime offenders.

In the Netherlands, several factors promoted the development of international drug trafficking and domestic drug production. The country became an important source of synthetic drugs and cannabis as well as a key hub for the international drug trade, leading the government to adopt stricter anti-drug trafficking measures. Police arrests for Opium Act offenses went from about 10–12,000 at the end of the 1990s to 18–23,000 in the 2000s and early 2010s. Similarly, public expenditure regarding these offenses went from €m 275 in 1995 to €m717 in 2007 (Van Ooyen-Houben & Kleemans, 2015:170). Because of these changes, the opportunities to participate in drug trafficking have significantly expanded for younger generations of Dutch residents. At the same time, these opportunities were accompanied by stricter law enforcement measures, with harsher penalties imposed for large-scale drug trafficking and increasingly strict controls at Dutch airports (Reuter, 2014).

These findings suggest that law enforcement actions targeted younger generations of organized crime offenders in our sample more frequently, stringently, and specifically. This intense scrutiny influenced their criminal careers, notably in terms of convictions and longer incarcerations. However, these patterns are unlikely to stem from more serious or intense offending, as we found limited support for generational shifts in violence or frequency once we controlled for possible confounders. We acknowledge that our data lacks detailed information on key risk factors such as personal, familial, and socio-economic conditions. Therefore, the observed differences could also result from varied distributions of factors like low self-control, socio-economic status, or drug use across different decades. In this regard, however, we note that our findings are consistent with the recent stream of empirical research pointing to the relevance of macro-level social changes on individual level offending patterns (Neil et al., 2021; Neil & Sampson, 2021; Payne & Piquero, 2020; Sampson & Ash Smith, 2021). This stream of research suggests, in other words, that 'when we are' is at least as important as 'who we are' in terms of offending trajectories (Piquero, 2023). We argue that our results align with evidence of important – yet largely overlooked– effects due to changes in criminal justice policies and priorities. However, compared to the evidence about less stringent criminal justice effects presented by prior research, our findings point to an opposite effect in the criminal justice system, namely a strengthening

and expanding of the criminal policies tackling serious and organized crime. Furthermore, we showed that there are important differences between countries, which points to the importance of 'where we are'. In today's Italy, younger generations of organized crime offenders face a stricter, more aggressive law enforcement, incomparable with the experience of organized crime offenders born in the 1950s or earlier, who often managed to secure acquittals, remain fugitives, or in any case received shorter sentences.[10] In the Netherlands, younger generations of organized crime offenders have more opportunities to engage in the drug trade, while the law enforcement measures have substantially stepped up compared to the previous decades.

Last, in both countries, the younger generation of offenders reported a lower share of property convictions. This is particularly relevant for the Dutch sample. For example, in the Dutch sample before age 23, property crimes accounted for over 64 % of the convictions among individuals born in 1960s. The same category accounted for only 13.6 % of crimes among individuals born in the 1980s. Similar patterns emerged also for the sample before age 30. These trends are in line with a general decline in property offenses experienced in most Western, industrialized countries since the 1990s (Aebi & Linde, 2012; Payne & Piquero, 2020; Tonry, 2014).

In addition to the issues and limitations already discussed in earlier sections, we wish to highlight further limitations of our study. Firstly, while the comparative approach provides valuable insights into the evolution of organized crime across the context of place and time (i.e. across countries and birth decades), there are notable differences between the two samples. These differences must be carefully considered when interpreting our findings. For example, the Italian sample lacks offenders actively participating in illicit traffics but unconnected to mafias, whose offending patterns might be more similar to offenders in the Netherlands. We note, once again, that we do not pretend that the samples are identical. Rather, we argue that each sample mirrors the empirical manifestation of organized crime in its respective country: mafias and illegal governance in Italy versus criminal groups mostly focused on international illicit markets in the Netherlands.

Secondly, our study lacks comparable and reliable data on the initial age of organized crime involvement. Such information would have provided insights into the early and pre-organized crime stages of criminal careers. To compensate, we chose two distinct and relatively distant age thresholds. Thirdly, for the Dutch sample, the combination of these age thresholds and the late onset of many organized crime careers resulted in relatively small sample sizes, impacting the reliability of the multinomial regressions. We attempted to mitigate these issues with several additional models. However, we recognize that only a larger sample, potentially available through future data collection waves of the Organized Crime Monitor, could fully address these concerns.

There are multiple paths for future research. First, additional research may focus on replicating the results on larger samples. For example, the original sample of Italian mafia offenders comprised over 11 thousand offenders. This approach will validate the results and provide a more comprehensive view of the Italian context. Second, it is essential to extend the analysis to other countries and diverse offender populations, thereby increasing the number of countries and types of organized crime. An intriguing avenue involves examining the criminal careers of Outlaw Motorcycle Gang (OMCG) members, particularly in nations like the Netherlands, Australia, and Denmark, where substantial research has already been conducted on this group. Analyses of OMCG members should also test the hypothesis of generational shift by controlling for possible confounding effects due to age, sampling bias, or social change.

In conclusion, we emphasize the importance of understanding the impact of recent changes in criminal justice system responses to organized crime on the criminal careers of offenders. This understanding is vital for a comprehensive evaluation of current strategies in combating organized crime. By exploring these diverse research avenues, we can gain significant insights into the effect of different situational factors, thereby addressing the pivotal question of 'when and where we are' in the evolving landscape of organized crime and its trajectories over time.

CRediT authorship contribution statement

Francesco Calderoni: Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Tommaso Comunale:** Writing – original draft, Data curation, Conceptualization. **Victor van der Geest:** Writing – review & editing, Writing – original draft, Methodology, Data curation, Conceptualization. **Edward R. Kleemans:** Writing – review & editing, Writing – original draft, Validation, Conceptualization.

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Declaration of competing interest

None.

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[10] For example, the penalties for mafia association, as outlined in Article 416-bis of the Criminal Code, have increased significantly since 1982. Initially, the imprisonment terms ranged from 3 to 6 years for simple participants and 4 to 9 years for directors and leaders. These terms increased to 4–9 years and 5–10 years respectively if the mafia association was armed. Over the years, with amendments in 2005, 2008, and 2015, these penalties have been substantially raised. Currently, the standard penalties are 10 to 15 years for participation and 12 to 18 years for leadership roles, escalating to 12–20 years and 15–26 years respectively if the association is armed. Note that the last penalty increase is not relevant to our Italian sample as it comprises only offenses committed up to 2016.

Appendix A. Appendix

Appendix Table 1
Individuals with at least 1 conviction by country, age threshold, and decade of birth as a share of the initial sample.

	Before age 21	Before age 23	Before age 25	Before age 27	Before age 30	Initial sample
Italy	44.6 %	56.6 %	66.9 %	73.7 %	80.7 %	3360
<50s	22.4 %	32.9 %	41.4 %	46.9 %	54.9 %	495
50s	43.6 %	54.5 %	62.3 %	69.4 %	76.1 %	798
60s	46.0 %	58.4 %	70.7 %	78.1 %	85.7 %	1332
70s	57.8 %	71.4 %	80.6 %	86.6 %	92.6 %	597
80s	60.1 %	72.5 %	89.9 %	95.7 %	100.0 %	138
Netherlands	30.0 %	36.3 %	43.8 %	51.2 %	60.8 %	1120
<50s	1.8 %	2.4 %	3.6 %	9.1 %	17.0 %	165
50s	24.4 %	30.8 %	39.5 %	43.6 %	49.6 %	266
60s	39.3 %	44.9 %	51.5 %	58.9 %	69.0 %	445
70s	34.7 %	42.7 %	57.3 %	69.3 %	84.9 %	199
80s	53.3 %	77.8 %	80.0 %	93.3 %	100.0 %	45
Initial sample	41.0 %	51.5 %	61.1 %	68.0 %	75.7 %	4480

Appendix Table 2
Descriptive statistics of the sample by age threshold and country.

	Before age 23			Before age 30		
Characteristic	Italy N = 1739[1]	Netherlands N = 402[1]	p-value[2]	Italy N = 2439[1]	Netherlands N = 653[1]	p-value[2]
Career parameters						
Age at 1st crime	18.6 (2.0)	17.4 (2.7)	<0.001***	20.5 (3.6)	20.7 (4.7)	0.789
Diversity Index	0.7 (0.3)	0.5 (0.4)	<0.001***	0.7 (0.2)	0.6 (0.3)	<0.001***
Duration	2.2 (2.1)	2.8 (2.8)	0.004**	6.0 (4.0)	5.0 (5.1)	<0.001***
Frequency	3.0 (2.6)	1.8 (1.4)	<0.001***	2.1 (2.0)	1.4 (1.1)	<0.001***
No. of crimes	6.3 (6.8)	5.2 (5.9)	<0.001***	11.0 (12.5)	6.5 (7.2)	<0.001***
Seriousness	35.2 (23.5)	21.3 (27.8)	<0.001***	38.9 (23.0)	26.2 (26.7)	<0.001***
Crime categories						
Drugs	0.3 (1.0)	0.2 (0.8)	0.071	0.6 (1.7)	0.7 (1.5)	0.003**
Misdemeanors	0.8 (1.6)	0.7 (1.2)	0.839	1.2 (2.1)	0.8 (1.4)	<0.001***
Organized crime	0.2 (0.4)	0.0 (0.2)	<0.001***	0.6 (0.7)	0.2 (0.4)	<0.001***
Other	0.8 (1.2)	0.2 (0.6)	<0.001***	1.3 (2.0)	0.4 (1.3)	<0.001***
Property	1.7 (2.4)	3.0 (4.5)	<0.001***	2.4 (3.1)	2.9 (5.1)	0.049*
Violent	1.3 (2.4)	0.8 (1.4)	<0.001***	2.6 (4.7)	1.0 (1.8)	<0.001***
Weapons	1.3 (2.5)	0.3 (0.7)	<0.001***	2.4 (4.9)	0.5 (1.0)	<0.001***

[1] Mean (SD)
[2] Mann–Whitney U test *p < 0.05; **p < 0.01; ***p < 0.001

Appendix Table 3
Descriptive statistics by country and decade of birth. crimes before age 23. mean (Standard Deviation).

	Italy, N = 1739						Netherlands, N = 402					
Characteristic	N	50s N = 435	60s N = 778	70s N = 426	80s N = 100	p-value[1]	N	50s N = 82	60s N = 200	70s N = 85	80s N = 35	p-value[1]
Career parameters												
Age at 1st crime	1739	18.6 (2.1)	18.7 (2.0)	18.7 (2.0)	18.3 (2.1)	0.134	402	18.5 (2.1)	16.8 (2.7)	17.3 (2.7)	19.3 (2.0)	<0.001***
Diversity Index	1389	0.6 (0.3)	0.7 (0.3)	0.7 (0.3)	0.7 (0.3)	<0.001***	307	0.6 (0.4)	0.5 (0.4)	0.6 (0.3)	0.5 (0.3)	0.030 *
N/A[3]		97	161	76	16			21	44	20	10	
Duration	1739	2.2 (2.2)	2.1 (2.1)	2.3 (2.0)	2.4 (2.2)	0.145	402	1.9 (2.0)	3.4 (3.0)	2.8 (2.9)	1.0 (1.7)	<0.001***
Frequency	1134	2.6 (1.6)	3.1 (2.8)	3.3 (3.0)	2.8 (1.8)	0.043 *	252	2.1 (1.1)	1.7 (1.2)	1.9 (1.6)	2.4 (3.1)	0.039 *
N/A[2]		158	287	128	32			33	59	34	24	
No. of crimes	1739	5.7 (5.4)	6.1 (6.5)	7.4 (8.7)	6.7 (5.8)	0.019 *	402	4.2 (3.6)	6.0 (7.1)	5.4 (5.4)	3.1 (2.3)	0.142
Seriousness	1631	26.6 (20.1)	36.6 (23.8)	39.3 (24.2)	44.2 (20.8)	<0.001***	402	20.2 (24.4)	18.0 (24.7)	20.8 (29.8)	43.7 (36.5)	0.002 **
N/A[4]		33	45	19	11							
Crime categories												

Appendix Table 3 (*continued*)

Characteristic	Italy, N = 1739						Netherlands, N = 402					
	N	50s N = 435	60s N = 778	70s N = 426	80s N = 100	p-value[1]	N	50s N = 82	60s N = 200	70s N = 85	80s N = 35	p-value[1]
Drugs	1739	0.0 (0.2)	0.2 (0.5)	0.6 (1.6)	0.8 (1.5)	<0.001 ***	402	0.0 (0.2)	0.1 (0.5)	0.4 (1.1)	0.8 (1.3)	<0.001 ***
Misdemeanors	1739	1.0 (1.6)	0.6 (1.1)	1.0 (2.2)	0.5 (0.9)	<0.001 ***	402	0.5 (0.8)	0.8 (1.3)	0.8 (1.3)	0.8 (1.1)	0.692
Organized crime	1739	0.0 (0.1)	0.1 (0.4)	0.3 (0.5)	0.6 (0.6)	<0.001 ***	402	0.0 (0.0)	0.0 (0.0)	0.1 (0.3)	0.3 (0.5)	<0.001 ***
Other	1739	1.0 (1.5)	0.6 (1.0)	0.7 (1.3)	0.7 (1.4)	<0.001 ***	402	0.1 (0.4)	0.2 (0.6)	0.3 (0.6)	0.2 (0.5)	0.049 *
Property	1739	2.0 (2.4)	1.7 (2.2)	1.7 (2.9)	1.2 (1.4)	0.005 **	402	2.3 (2.8)	3.8 (5.6)	2.6 (3.4)	0.4 (1.4)	<0.001 ***
Violent	1739	0.9 (1.3)	1.3 (2.3)	1.7 (3.3)	1.8 (2.1)	<0.001 ***	402	0.8 (1.2)	0.8 (1.3)	0.9 (1.7)	0.3 (1.0)	0.007 **
Weapons	1739	0.8 (1.4)	1.6 (2.9)	1.3 (2.4)	1.2 (2.4)	<0.001 ***	402	0.3 (0.7)	0.2 (0.6)	0.4 (1.0)	0.3 (0.8)	0.392

[1] Kruskall-Wallis test of differences per country and decade of birth *p < 0.05; **p < 0.01; ***p < 0.001
[2] The diversity index is unavailable when offenders only committed one crime.
[3] The frequency is unavailable when offenders only committed crime(s) in one year, thus reporting a duration of 0.
[4] The seriousness is unavailable for some offenders in the Italian sample when it was impossible to identify the average statutory penalty for all the offenses they have committed.

Appendix Table 4
Descriptive statistics by country and decade of birth. crimes before age 30. mean (Standard Deviation).

Characteristic	Italy, N = 2439						Netherlands, N = 653					
	N	50s N = 607	60s N = 1141	70s N = 553	80s N = 138	p-value[1]	N	50s N = 132	60s N = 307	70s N = 169	80s N = 45	p-value[1]
Career parameters												
Age at 1st crime	2439	20.5 (3.7)	20.8 (3.6)	20.2 (3.4)	20.0 (3.5)	0.001 **	653	21.1 (4.0)	20.0 (5.1)	21.4 (4.8)	20.7 (3.3)	0.007 **
Diversity Index	2227	0.7 (0.3)	0.7 (0.2)	0.8 (0.2)	0.8 (0.2)	<0.001 ***	524	0.6 (0.3)	0.6 (0.3)	0.6 (0.3)	0.6 (0.2)	0.096
N/A[3]		70	102	29	11			29	59	33	8	
Duration	2439	5.9 (4.2)	6.0 (4.1)	6.2 (3.8)	5.3 (3.4)	0.078	653	4.9 (4.6)	5.8 (5.3)	4.2 (5.1)	3.1 (4.0)	<0.001***
Frequency	2081	1.9 (1.8)	2.2 (2.3)	2.0 (1.8)	2.0 (1.4)	0.350	425	1.4 (1.0)	1.3 (0.9)	1.6 (1.3)	1.5 (1.2)	0.137
N/A[2]		109	171	62	16			39	89	78	22	
No. of crimes	2439	10.2 (10.0)	11.6 (14.5)	11.5 (11.5)	9.1 (6.5)	0.043 *	653	6.1 (5.9)	7.0 (8.1)	6.5 (7.0)	4.5 (3.0)	0.737
Seriousness	2314	31.8 (22.3)	40.6 (23.8)	42.0 (21.0)	43.3 (19.9)	<0.001 ***	653	22.5 (26.5)	22.3 (24.5)	34.1 (28.8)	34.5 (25.7)	<0.001***
N/A[4]		35	56	22	12							
Crime categories												
Drugs	2439	0.2 (0.6)	0.5 (1.2)	1.1 (2.8)	1.1 (1.8)	<0.001 ***	653	0.3 (0.9)	0.5 (1.0)	1.4 (2.0)	1.5 (1.8)	<0.001***
Misdemeanors	2439	1.4 (2.2)	1.1 (1.8)	1.4 (2.8)	0.7 (1.2)	<0.001 ***	653	0.7 (1.2)	0.9 (1.5)	0.7 (1.4)	0.9 (1.2)	0.227
Organized crime	2439	0.2 (0.4)	0.5 (0.7)	0.9 (0.6)	1.1 (0.4)	<0.001 ***	653	0.0 (0.0)	0.2 (0.4)	0.4 (0.5)	0.4 (0.5)	<0.001***
Other	2439	1.6 (2.3)	1.2 (2.0)	1.2 (1.9)	1.0 (1.6)	<0.001 ***	653	0.4 (1.2)	0.5 (1.5)	0.5 (1.2)	0.2 (0.6)	0.476
Property	2439	2.8 (3.2)	2.5 (3.2)	2.1 (3.0)	1.4 (2.0)	<0.001 ***	653	2.9 (4.0)	3.6 (6.1)	2.2 (4.0)	0.7 (1.3)	<0.001***
Violent	2439	2.0 (3.4)	2.8 (5.5)	2.8 (4.6)	2.3 (2.5)	<0.001 ***	653	1.1 (1.7)	1.0 (1.7)	0.9 (2.0)	0.5 (1.5)	0.001 **
Weapons	2439	2.1 (3.1)	2.8 (6.4)	1.9 (3.1)	1.5 (2.4)	<0.001 ***	653	0.7 (1.1)	0.4 (0.9)	0.5 (1.2)	0.4 (0.8)	0.024 *

[1] Kruskall-Wallis test of differences per country and decade of birth *p < 0.05; **p < 0.01; ***p < 0.001
[2] Frequency is unavailable when offenders only committed crime(s) in one year, thus reporting a duration of 0.
[3] The diversity index is unavailable when offenders only committed one crime.
[4] The seriousness is unavailable for some offenders in the Italian sample when it was impossible to identify the average statutory penalty for all the offenses they have committed.
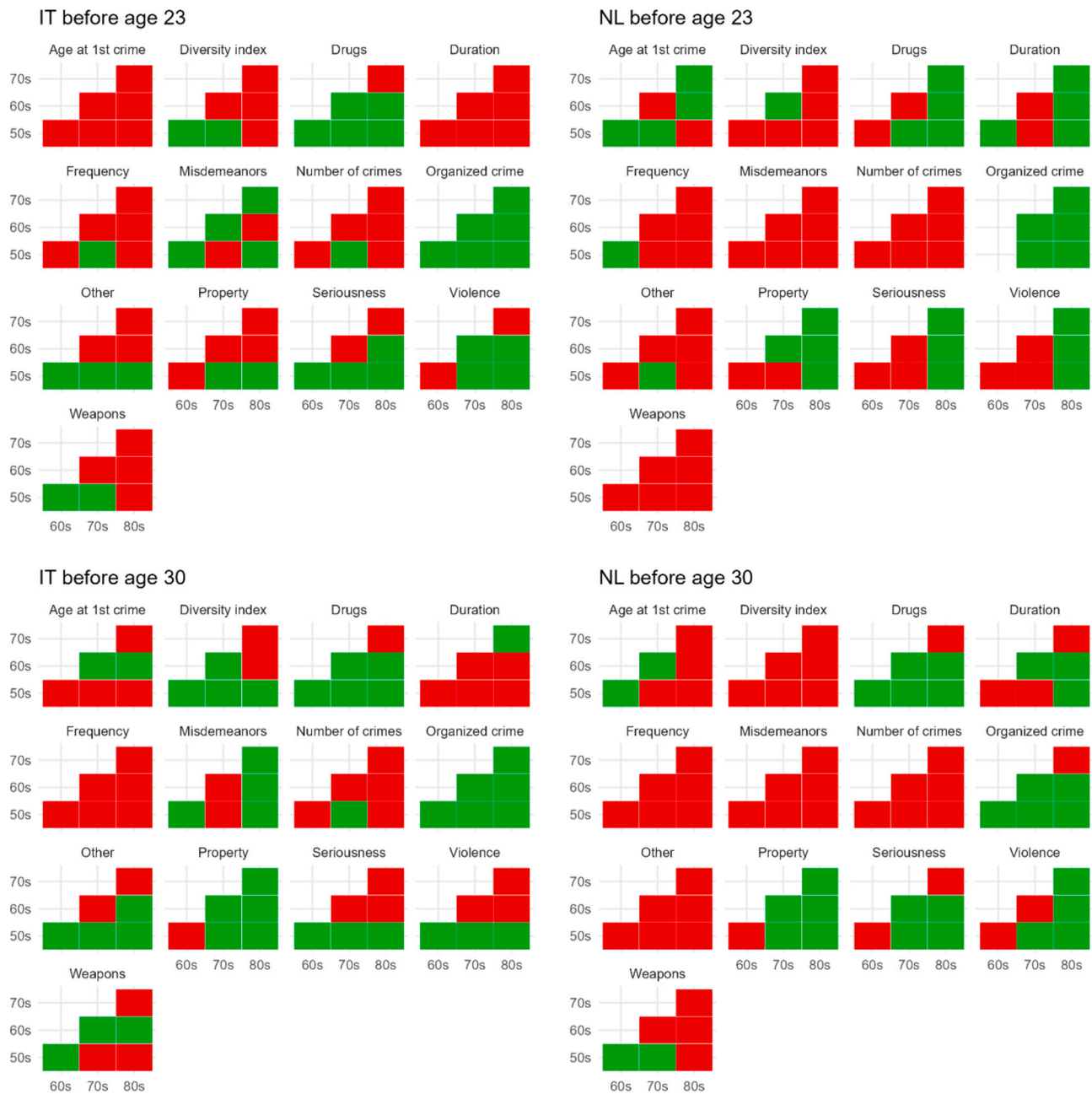
Appendix Fig. 1. Summary of the Results of Pairwise Wilcoxon Rank Sum Tests Across Decades of Birth by Country and Age Threshold.
Note: Each tile represents Wilcoxon rank sum test results between two decades of birth. Green tiles signify statistically significant differences ($p < 0.05$), while red tiles indicate non-significant differences. For instance, in the Italian sample before age 30 (lower left pane), statistically significant differences in the age at first crime are present only between the 60s and 70s, and between the 60s and 80s.

Appendix Table 5
Results of OLS Regressions. Italian Sample. Coefficients (Std. Errors).

	Dependent variable: seriousness						Dependent variable: frequency					
	Before age 23			Before age 30			Before age 23			Before age 30		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
50s (reference 80s)	−17.57***	−15.64***	−5.37**	−11.50***	−12.23***	−2.20	−0.29	0.03	−0.10	−0.09	−0.03	0.19*
	(2.68)	(2.53)	(2.30)	(2.23)	(2.18)	(1.93)	(0.20)	(0.13)	(0.13)	(0.17)	(0.11)	(0.11)
60s (reference 80s)	−7.57***	−6.96***	−1.82	−2.74	−4.32**	0.70	0.08	0.09	−0.04	0.12	0.01	0.16
	(2.57)	(2.43)	(2.17)	(2.13)	(2.09)	(1.81)	(0.19)	(0.12)	(0.12)	(0.16)	(0.11)	(0.11)
70s (reference 80s)	−4.90*	−4.48*	0.24	−1.35	−2.67	0.74	0.15	−0.07	−0.12	0.15	0.09	0.09

(continued on next page)

Appendix Table 5 (*continued*)

	Dependent variable: seriousness						Dependent variable: frequency					
	Before age 23			Before age 30			Before age 23			Before age 30		
	(2.68)	(2.53)	(2.19)	(2.24)	(2.19)	(1.84)	(0.20)	(0.12)	(0.12)	(0.17)	(0.11)	(0.11)
Frequency		5.27***	4.29***		1.42***	2.07***						
		(0.49)	(0.43)		(0.40)	(0.35)						
Age at 1sts crime		0.14	0.12		0.57***	0.34**		−0.01	−0.01		−0.03***	−0.03***
		(0.42)	(0.36)		(0.20)	(0.17)		(0.02)	(0.02)		(0.01)	(0.01)
Number of crimes		−0.51***			0.26***			0.24***			0.12***	
		(0.15)			(0.06)			(0.00)			(0.00)	
Duration		2.60***	3.67***		0.41*	1.22***		−0.52***	−0.52***		−0.26***	−0.27***
		(0.50)	(0.43)		(0.21)	(0.19)		(0.02)	(0.02)		(0.01)	(0.01)
Seriousness								0.01***	0.01***		0.00***	0.01***
								(0.00)	(0.00)		(0.00)	(0.00)
Organized crime			4.51***			5.06***			0.21***			0.12***
			(1.32)			(0.66)			(0.08)			(0.04)
Drugs			−0.72			−0.64**			0.15***			0.34***
			(0.49)			(0.26)			(0.03)			(0.01)
Misdemeanors			−3.36***			−1.83***			0.24***			0.12***
			(0.33)			(0.20)			(0.02)			(0.01)
Violent			2.26***			1.74***			0.17***			0.10***
			(0.26)			(0.12)			(0.01)			(0.01)
Other			−3.51***			−2.53***			0.25***			0.14***
			(0.40)			(0.21)			(0.02)			(0.01)
Property			−3.08***			−2.04***			0.26***			0.15***
			(0.24)			(0.15)			(0.01)			(0.01)
Weapons			0.60**			0.41***			0.30***			0.10***
			(0.27)			(0.11)			(0.01)			(0.01)
Constant	44.20***	26.69***	24.20***	43.31***	24.81***	23.48***	2.09***	1.47***	1.51***	1.65***	2.42***	2.14***
	(2.43)	(8.80)	(7.60)	(2.02)	(5.28)	(4.45)	(0.18)	(0.43)	(0.43)	(0.15)	(0.27)	(0.26)
Observations	1631	1631	1631	2314	2314	2314	1739	1631	1631	2439	2314	2314
R^2	0.05	0.16	0.39	0.03	0.09	0.36	0.01	0.67	0.68	0.00	0.60	0.65
Adjusted R^2	0.05	0.16	0.38	0.03	0.08	0.36	0.01	0.67	0.67	0.00	0.60	0.65
Residual Std. Error												
F Statistic	28.63*** (df = 3; 1627)	43.93*** (df = 7; 1623)	78.11*** (df = 13; 1617)	25.52*** (df = 3; 2310)	31.49*** (df = 7; 2306)	101.49*** (df = 13; 2300)	5.28*** (df = 3; 1735)	465.33*** (df = 7; 1623)	259.12*** (df = 13; 1617)	2.33* (df = 3; 2435)	497.04*** (df = 7; 2306)	328.73*** (df = 13; 2300)

Note:*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

Appendix Table 6
Results of OLS Regressions. Dutch Sample. Coefficients (Std. Errors).

	Dependent variable: seriousness						Dependent variable: frequency					
	Before age 23			Before age 30			Before age 23			Before age 30		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
50s (reference 80s)	−23.47***	−21.37***	−9.98**	−11.97***	−13.97***	−5.83	−0.68***	−0.45***	−0.16	−0.74***	−0.60***	−0.32**
	(5.45)	(4.53)	(4.63)	(4.52)	(4.02)	(3.79)	(0.20)	(0.13)	(0.14)	(0.20)	(0.15)	(0.15)
60s (reference 80s)	−25.69***	−27.00***	−14.61***	−12.20***	−16.00***	−9.07***	−0.83***	−0.45***	−0.18	−0.66***	−0.43***	−0.25*
	(4.94)	(4.29)	(4.38)	(4.18)	(3.71)	(3.44)	(0.18)	(0.13)	(0.13)	(0.18)	(0.14)	(0.14)
70s (reference 80s)	−22.87***	−23.90***	−15.83***	−0.35	−4.70	−4.49	−0.59***	−0.30**	−0.13	−0.10	−0.18	−0.14
	(5.42)	(4.53)	(4.42)	(4.39)	(3.84)	(3.47)	(0.20)	(0.13)	(0.13)	(0.19)	(0.14)	(0.14)
Frequency		7.52***	2.80		4.14***	1.72*						
		(1.74)	(1.74)		(1.03)	(0.97)						
Age at 1sts crime		2.04***	1.74***		1.00***	0.51*		0.02	0.01		0.05***	0.03***
		(0.60)	(0.56)		(0.30)	(0.28)		(0.02)	(0.02)		(0.01)	(0.01)
Number of crimes		1.01***			1.14***			0.16***			0.11***	
		(0.38)			(0.21)			(0.01)			(0.01)	
Duration		4.00***	2.67***		1.60***	0.68**		−0.26***	−0.26***		−0.15***	−0.16***
		(0.78)	(0.76)		(0.36)	(0.34)		(0.02)	(0.02)		(0.01)	(0.01)
Seriousness								0.01***	0.00		0.01***	0.00*
								(0.00)	(0.00)		(0.00)	(0.00)
Organized crime			32.59***			14.15***			0.92***			0.61***
			(5.77)			(2.15)			(0.17)			(0.09)
Drugs			7.94***			5.94***			0.31***			0.19***
			(1.53)			(0.65)			(0.04)			(0.03)

Appendix Table 6 (*continued*)

	Dependent variable: seriousness						Dependent variable: frequency					
	Before age 23			Before age 30			Before age 23			Before age 30		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Misdemeanors			−0.42			−1.78**			0.16***			0.14***
			(1.03)			(0.74)			(0.03)			(0.03)
Violent			3.37***			3.88***			0.16***			0.08***
			(0.91)			(0.56)			(0.03)			(0.02)
Other			−0.98			−1.87***			0.18***			0.11***
			(1.86)			(0.64)			(0.05)			(0.03)
Property			1.45***			1.14***			0.16***			0.10***
			(0.40)			(0.22)			(0.01)			(0.01)
Weapons			6.86***			2.77***			0.27***			0.17***
			(1.53)			(0.89)			(0.04)			(0.04)
Constant	43.69***	−18.97	−19.49*	34.47***	−4.21	2.90	2.16***	1.36***	1.16***	1.90***	0.67**	0.80***
	(4.56)	(12.56)	(11.78)	(3.90)	(7.62)	(6.95)	(0.17)	(0.35)	(0.34)	(0.17)	(0.29)	(0.28)
Observations	402	402	402	653	653	653	402	402	402	653	653	653
R^2	0.06	0.40	0.49	0.04	0.29	0.43	0.05	0.64	0.67	0.06	0.48	0.52
Adjusted R^2	0.06	0.39	0.47	0.04	0.28	0.42	0.05	0.63	0.66	0.06	0.47	0.51
Residual Std.	26.98 (df = 398)	21.74 (df = 394)	20.24 (df = 388)	26.16 (df = 649)	22.66 (df = 645)	20.37 (df = 639)	0.99 (df = 398)	0.61 (df = 394)	0.59 (df = 388)	1.14 (df = 649)	0.85 (df = 645)	0.83 (df = 639)
F Statistic	9.08*** (df = 3; 398)	37.30*** (df = 7; 394)	28.28*** (df = 13; 388)	9.86*** (df = 3; 649)	37.13*** (df = 7; 645)	37.00*** (df = 13; 639)	7.35*** (df = 3; 398)	99.17*** (df = 7; 394)	60.87*** (df = 13; 388)	13.92*** (df = 3; 649)	84.65*** (df = 7; 645)	52.63*** (df = 13; 639)

Note:*p < 0.1; **p < 0.05; ***p < 0.01

References

Aebi, M. F., & Linde, A. (2012). Conviction statistics as an Indicator of crime trends in Europe from 1990 to 2006. *European Journal on Criminal Policy and Research, 18*(1), 103–144. https://doi.org/10.1007/s10610-011-9166-7

Bersani, B. E., Laub, J. H., & Nieuwbeerta, P. (2009). Marriage and desistance from crime in the Netherlands: Do gender and socio-historical context matter? *Journal of Quantitative Criminology, 25*(1), 3–24. https://doi.org/10.1007/s10940-008-9056-4

Blokland, A. A. J., van Hout, L., van der Leest, W., & Soudijn, M. (2019). Not your average biker; criminal careers of members of Dutch outlaw motorcycle gangs. *Trends in Organized Crime, 22*(1), 10–33. https://doi.org/10.1007/s12117-017-9303-x

Boivin, R. (2014). Risks, prices, and positions: A social network analysis of illegal drug trafficking in the world-economy. *International Journal of Drug Policy, 25*(2), 235–243. https://doi.org/10.1016/j.drugpo.2013.12.004

Breuer, N., & Varese, F. (2023). The structure of trade-type and governance-type organized crime groups: A network study. *The British Journal of Criminology, 63*(4), 867–888. https://doi.org/10.1093/bjc/azac065

Calderoni, F., Comunale, T., Campedelli, G. M., Marchesi, M., Manzi, D., & Frualdo, N. (2022). Organized crime groups: A systematic review of individual-level risk factors related to recruitment. *Campbell Systematic Reviews, 18*(1), Article e1218. https://doi.org/10.1002/cl2.1218

Calderoni, F., Comunale, T., van der Geest, V., & Kleemans, E. R. (2024). Comparing the criminal careers of organized crime offenders in Italy and the Netherlands. *European Journal of Criminology*. https://doi.org/10.1177/14773708241232980

Campana, P., & Varese, F. (2018). Organized crime in the United Kingdom: Illegal governance of markets and communities. *The British Journal of Criminology.*. https://doi.org/10.1093/bjc/azx078

Campedelli, G. M., Calderoni, F., Comunale, T., & Meneghini, C. (2021). Life-course criminal trajectories of mafia members. *Crime & Delinquency, 67*(1), 111–141, 10/gt47gf.

CBS. 2010. "Standaardclassificatie Misdrijven 2010." Centraal Bureau voor de Statistiek. Retrieved December 19, 2022 (https://www.cbs.nl/nl-nl/onze-diensten/methoden/classificaties/misdrijven/standaardclassificatie-misdrijven-2010).

Cook, S. J., Hays, J. C., & Franzese, R. J. (2020). Fixed effects in rare events data: A penalized maximum likelihood solution. *Political Science Research and Methods, 8*(1), 92–105. https://doi.org/10.1017/psrm.2018.40

Curry, G. D., Decker, S. H., & Egley, A. (2002). Gang involvement and delinquency in a middle school population. *Justice Quarterly, 19*(2), 275–292. https://doi.org/10.1080/07418820200095241

Curry, G. D., Decker, S. H., & Pyrooz, D. C. (2014). *Confronting gangs: Crime and community* (3rd ed.). New York: Oxford University Press.

Street Gangs, Terrorists, Drug Smugglers, and Organized Crime: What's the Difference?. *The Handbook of Gangs,* (pp. 294–308). (2015) (pp. 294–308). Chichester: Wiley.

Farrington, D. P. (2015). Cross-National Comparative Research on criminal careers, risk factors, crime and punishment. *European Journal of Criminology, 12*(4), 386–399. https://doi.org/10.1177/1477370815584262

Fijnaut, C., Bovenkerk, F., Bruinsma, G., & Van De Bunt, H. (1998). *Organized crime in the Netherlands*. Den Haag: Kluwer Law International.

Fijnaut, C., & Paoli, L. (2004). Introduction to part I: The history of the concept. In C. Fijnaut, & L. Paoli (Eds.), *Organised crime in Europe: Concepts, patterns and control policies in the European Union and beyond, studies of organized crime* (pp. 21–46). Dordrecht: Springer.

Francis, B., & Humphreys, L. (2016). Investigating the relationship between the diversity index and frequency of offending. *Journal of Developmental and Life-Course Criminology, 2*(4), 397–416. https://doi.org/10.1007/s40865-016-0034-5

Fuller, G., Morgan, A., & Brown, R. (2019). *Criminal histories of Australian organised crime offenders. 567*. Canberra: Australian Institute of Criminology.

Gatti, U., Tremblay, R. E., Vitaro, F., & McDuff, P. (2005). Youth gangs, delinquency and drug use: A test of the selection, facilitation, and enhancement hypotheses. *Journal of Child Psychology and Psychiatry, 46*(11), 1178–1190. https://doi.org/10.1111/j.1469-7610.2005.00423.x

Istat. (2023). *Delitti Denunciati Dalle Forze Di Polizia All'Autorità Giudiziaria per Tipo Di Delitto - Anni 1955–2014*.

Kleemans, E. R. (2007). Organized crime, transit crime, and racketeering. *Crime and Justice, 35*(1), 163–215. https://doi.org/10.1086/501509

Kleemans, E. R. (2015). Organized crime research: Challenging assumptions and informing policy. In J. Knutsson, & E. Cockbain (Eds.), *Applied police research* (pp. 57–67). Cullompton: Routledge.

Kleemans, E. R., & de Poot, C. J. (2008). Criminal careers in organized crime and social opportunity structure. *European Journal of Criminology, 5*(1), 69–98.

Kleemans, E. R., & van Koppen, V. (2020). Organized crime and criminal careers. *Crime and Justice, 49*, 385–423. https://doi.org/10.1086/707318

Klement, C. (2016). Outlaw biker affiliations and criminal involvement. *European Journal of Criminology, 13*(4), 453–472. https://doi.org/10.1177/1477370815626460

Kosmidis, I., Pagui, E. C. K., Konis, K., & Sartori, N. (2023). *Brglm2: Bias reduction in generalized linear models*.

Kosmidis, I., Pagui, E. C. K., & Sartori, N. (2020). Mean and median Bias reduction in generalized linear models. *Statistics and Computing, 30*(1), 43–59. https://doi.org/10.1007/s11222-019-09860-6

Krohn, M. D., & Thornberry, T. P. (2008). In A. M. Liberman (Ed.), *Longitudinal Perspectives on Adolescent Street Gangs. Pp. 128–60 in The Long View of Crime: A Synthesis of Longitudinal Research*. New York, NY: Springer New York.

Kruisbergen, E. W., van de Bunt, H. G., & E. R: Kleemans.. (2012). *Georganiseerde criminaliteit in Nederland. Vierde rapportage op basis van de Monitor Georganiseerde Criminaliteit* (1st ed.). L'Aia: WODC.

Kruisbergen, E. W., Roks, R. A., & Kleemans, E. R. (2019). *Georganiseerde Criminaliteit in Nederland: Daders, Verwevenheid En Opsporing: Rapportage in Het Kader van de Vijfde ronde van de monitor georganiseerde Criminaliteit [organized crime in the Netherlands: Perpetrators, interconnectedness and detection: Reporting in the context of the fifth round of the organized monitor crime]*. Den Haag: WODC.

Lussier, Patrick, Evan McCuish, Nadine Deslauriers-Varin, and Raymond Corrado. 2017. "Crime Specialization as a Dynamic Process?: Criminal Careers, Crime Mix, and Crime Specialization in Chronic, Serious, and Violent Offenders." Pp. 112–39in *The Routledge International Handbook of Life-Course Criminology*, Routledge international handbooks, edited by A. A. J. Blokland and V. R. Van der Geest. London New York: Routledge.

La Spina, A. (2008). Recent anti-mafia strategies: The Italian experience. In D. Siegel, & H. Nelen (Eds.), *Organized crime: Culture, markets and policies* (pp. 195–206). New York: Springer.

McGloin, J. M., & Thomas, K. J. (2019). Peer influence and delinquency. *Annual Review of Criminology, 2*(1), 241–264. https://doi.org/10.1146/annurev-criminol-011518-024551

Melde, C., & Esbensen, F.-A. (2011). Gang membership as a turning point in the life course. *Criminology, 49*(2), 513–552. https://doi.org/10.1111/j.1745-9125.2011.00227.x

Meneghini, C., Campedelli, G. M., Calderoni, F., & Comunale, T. (2021). Criminal careers prior to recruitment into Italian organized crime. *Crime & Delinquency, 69*(11), 2243–2273. https://doi.org/10.1177/00111287211035994

Morgan, A., & Payne, J. (2021). *Organised crime and criminal careers: Findings from an Australian sample. 637.* Canberra: Australian Institute of Criminology.

Neil, R., & Sampson, R. J. (2021). The birth lottery of history: Arrest over the life course of multiple cohorts coming of age, 1995–2018. *American Journal of Sociology, 126*(5), 1127–1178. https://doi.org/10.1086/714062

Neil, R., Sampson, R. J., & Nagin, D. S. (2021). Social change and cohort differences in group-based arrest trajectories over the last quarter-century. *Proceedings of the National Academy of Sciences, 118*(31), Article e2107020118. https://doi.org/10.1073/pnas.2107020118

Payne, J., & Piquero, A. R. (2020). *Developmental criminology and the crime decline. A comparative analysis of the criminal careers of two New South Wales birth cohorts.* Cambridge: Cambridge University Press.

Pedersen, M. L. (2018). Do offenders have distinct offending patterns before they join adult gang criminal groups? Analyses of crime specialization and escalation in offence seriousness. *European Journal of Criminology, 15*(6), 680–701. https://doi.org/10.1177/1477370817751351

Pennings, L., Bruinsma, G., & Weerman, F. M. (2006). Jeugd en georganiseerde misdaad: Een empirische verkenning van de betrokkenheid van jongeren bij illegale handel. *Tijdschrift voor Criminologie, 01*.

Piquero, A. R. (2023). 'We study the past to understand the present; we understand the present to guide the future': The time capsule of developmental and life-course criminology. *Journal of Criminal Justice, 85*, Article 101932. https://doi.org/10.1016/j.jcrimjus.2022.101932

Piquero, A. R., Brame, R., & Lynam, D. (2004). Studying criminal career length through early adulthood among serious offenders. *Crime & Delinquency, 50*(3), 412–435. https://doi.org/10.1177/0011128703260333

Piquero, A. R., Farrington, D. P., & Blumstein, A. (2003). The criminal career paradigm. *Crime and Justice, 30*, 359–506, 10/gqhcsh.

Piquero, A. R., Paternoster, R., Mazerolle, P., Brame, R., & Dean, C. W. (1999). Onset age and offense specialization. *Journal of Research in Crime and Delinquency, 36*(3), 275–299. https://doi.org/10.1177/0022427899036003002

Pyrooz, D. C., Turanovic, J. J., Decker, S. H., & Jun, W. (2016). Taking stock of the relationship between gang membership and offending: A Meta-analysis. *Criminal Justice and Behavior, 43*(3), 365–397. https://doi.org/10.1177/0093854815605528

Reiss, A. J. (1988). Co-offending and criminal careers. *Crime and Justice, 10*, 117–170. https://doi.org/10.1086/449145

Reuter, P. (2014). The mobility of drug trafficking. In *Ending the drug wars. Report of the LSE expert group on the economics of drug policy* (pp. 33–40). London: London School of Economics.

Reuter, P., & Tonry, M. (2020). Organized crime: Less than meets the eye. *Crime and Justice, 49*, 1–16. https://doi.org/10.1086/709447

Sampson, R. J., & Ash Smith, L. (2021). Rethinking criminal propensity and character: Cohort inequalities and the power of social change. *Crime and Justice, 50*, 13–76. https://doi.org/10.1086/716005

Savona, E. U., Calderoni, F., Campedelli, G. M., Comunale, T., Ferrarini, M., & Meneghini, C. (2020). The criminal careers of Italian mafia members. In D. Weisburd, E. U. Savona, B. Hasisi, & F. Calderoni (Eds.), *Understanding recruitment to organized crime and terrorism* (pp. 241–267). Cham: Springer.

Song, M., & Zhong, H. (2020). Efficient weighted univariate clustering maps outstanding dysregulated genomic zones in human cancers. *Bioinformatics, 36*(20), 5027–5036. https://doi.org/10.1093/bioinformatics/btaa613

Steffensmeier, D., Yunmei, L., & Kumar, S. (2019). Age–crime relation in India: Similarity or divergence vs. Hirschi/Gottfredson inverted J-shaped projection? *The British Journal of Criminology, 59*(1), 144–165. https://doi.org/10.1093/bjc/azy011

Steffensmeier, D., Zhong, H., & Yunmei, L. (2017). Age and its relation to crime in Taiwan and the United States: Invariant, or does cultural context matter? *Criminology, 55*(2), 377–404. https://doi.org/10.1111/1745-9125.12139

Storti, C., & Cláudia, and Paul De Grauwe.. (2009). The cocaine and heroin Markets in the era of globalisation and drug reduction policies. *International Journal of Drug Policy, 20*(6), 488–496. https://doi.org/10.1016/j.drugpo.2009.02.004

Sullivan, C. J., McGloin, J. M., Pratt, T. C., & Piquero, A. R. (2006). Rethinking the 'norm' of offender generality: Investigating specialization in the short-term. *Criminology, 44*(1), 199–233. https://doi.org/10.1111/j.1745-9125.2006.00047.x

Sullivan, C. J., & Piquero, A. R. (2016). The criminal career concept: Past, present, and future. *Journal of Research in Crime and Delinquency, 53*(3), 420–442. https://doi.org/10.1177/0022427815627313

Thornberry, T. P., Krohn, M. D., Lizotte, A. J., & Chard-Wierschem, D. (1993). The role of juvenile gangs in facilitating delinquent behavior. *Journal of Research in Crime and Delinquency, 30*(1), 55–87. https://doi.org/10.1177/0022427893030001005

Tonry, M. (2014). Why crime rates are falling throughout the Western world. *Crime and Justice, 43*(1), 1–63. https://doi.org/10.1086/678181

Van Deuren, S., Blokland, A. A. J., & Kleemans, E. (2022). Examining membership of Dutch outlaw motorcycle gangs and its association with Indqividual criminal careers. *Deviant Behavior, 43*(7), 880–895. https://doi.org/10.1080/01639625.2021.1919498

Van Koppen, M., & Vere, and Christianne J. de Poot.. (2013). The truck driver who bought a Café: Offenders on their involvement mechanisms for organized crime. *European Journal of Criminology, 10*(1), 74–88.

Van Koppen, M., Vere, C. J., Poot, D., & Blokland, A. A. J. (2010). Comparing criminal careers of organized crime offenders and general offenders. *European Journal of Criminology, 7*(5), 356–374.

Van Ooyen-Houben, M., & Kleemans, E. (2015). Drug policy: the 'dutch model'. *Crime and Justice, 44*, 165–226. https://doi.org/10.1086/681551

Van Der Geest, Victor, M. V., Koppen, V., & Kleemans, E. R. (2020). Delinquent development, employment and income in a sample of Dutch organized crime offenders: Shape, content, and correlates of delinquent trajectories from age 12 to 65. In D. Weisburd, E. U. Savona, B. Hasisi, & F. Calderoni (Eds.), *Understanding recruitment to organized crime and terrorism* (pp. 309–335). Cham: Springer International Publishing.

Van Deuren, S., Blokland, A. A. J., & Kleemans, E. R. (2021). Differentiating between outlaw motorcycle gangs (OMCGs): Estimating the effect of membership of the Most crime-prone OMCGs on crime using matching weights. *Journal of Developmental and Life-Course Criminology, 7*(4), 649–675. https://doi.org/10.1007/s40865-021-00180-w

Varese, F. (2017). What Is Organised Crime. Pp. 27–55. In S. Carnevale, S. Forlati, & O. Giolo (Eds.), *Redefining Organised Crime: A Challenge for the European Union?* Oxford: Hart Publishing.

Voce, I., Morgan, A., & Dowling, C. (2021). *Early-career offending trajectories among outlaw motorcycle gang members. 625.* Canberra: Australian Institute of Criminology.

Wang, H., & Song, M. (2011). Ckmeans.1d.Dp: Optimal k-means clustering in one dimension by dynamic programming. *The R Journal, 3*(2), 29–33. https://doi.org/10.32614/RJ-2011-015

Weisburd, D., & Waring, E. (2001). *White-collar crime and criminal careers* (1st ed.). Cambridge: Cambridge University Press.

Wright, K. A., Pratt, T. C., & DeLisi, M. (2008). Examining offending specialization in a sample of male multiple homicide offenders. *Homicide Studies, 12*(4), 381–398, 10/csfrvh.