

**STOP AND GO: EXPLAINING THE TIMING OF INTERMITTENCY CYCLES IN CRIMINAL
CAREERS**

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Abstract

Few offenders maintain a linear or constant path in their criminal activities; instead, zigzag paths characterize most criminal careers. The present study seeks to understand the dynamics of such intermittent cycles and examines the effect of direct experience with the justice system and offender success in criminal ventures on the likelihood that offenders will interrupt and then restart their illegal activities. Using the method of life history calendars, the study is based on detailed criminal career data from 172 offenders involved in lucrative forms of crime. Results show the relevance and complementarity of sanctions and dimensions of criminal achievement in understanding an offending path. The research design highlights the importance of considering the timing of circumstances in understanding zigzag paths.

Keywords: Intermittency, Rational choice, Criminal justice interventions, Criminal achievement, Life history calendar

Introduction

Knowledge about criminal careers has evolved significantly over the past decades and it is now well documented that few individuals involved in criminal activity follow a linear path or maintain a constant rate of activity. Matza (1964; see also Nagin & Land, 1993) observed some time ago that offenders often temporarily abstain from criminal activity. Glaser (1969), in his study of prison and parole systems, goes further, showing that a zigzag path—intermittent cycles of offending and non-offending—is characteristic of most criminal careers (see Horney & Marshall, 1991; Laub & Sampson, 2003; Piquero, 2004). According to Glaser, the number of cycles and their duration vary from one individual to another. The frequency of zigzag paths has led researchers to look at the conceptualization of desistance (Bushway et al., 2001; Piquero, 2004) and to warn researchers about the illusion that these temporary interruptions can create (Kazemian, 2007; Kazemian & Maruna, 2009), arguing that these pauses should not be taken to indicate permanent desistance from crime.

The intermittency of crime is understudied, mainly because it is difficult to identify (Piquero, 2004). To avoid confusion and clearly distinguish these pauses in relation to the “real” end of a criminal career, some authors characterize these events as temporary desistance (Tunnel, 1992) or as episodes of primary desistance (Maruna & Farrall, 2004). Secondary desistance is then the final stage of the offending path, the movement from the behavior of non-offending to the role or identity of a non-offender (Maruna & Farrall, 2004: 19), and refers not only to a shift in identity but also to maintaining the initial decision to give up crime. This twofold definition of desistance is consistent with the thinking of many researchers, who see the end of criminal careers as a process (Bushway et al., 2001). Episodes of intermittence (primary desistance) could therefore be part of a “glide path” (declining criminality) toward desistance.

The goal of this article is to investigate both ends of episodes of inactivity in criminal careers. Our use of the concept of intermittency is based on Piquero’s (2004) definition: “a temporary abstinence from criminal activity during a particular period of time only to be followed by a resumption of criminal

activity after a particular period of time” (2004: 108). Such a conceptualization of intermittency does not imply a desire on the part of the offender to end his criminal career, as we do not have information about motives. Nor does it require introducing a purpose behind episodes of intermittency, recognizing that there may be several reasons motivating offenders to take a break from their criminal activity. In a study focused on intermittency in criminal careers, based on 15 interviews with adult offenders followed since adolescence, Carlsson (2012) discovered two different forms of intermittent offending. The first involves a pause without any commitment to stop offending in the future, while the second can best be understood as an attempt (or failure) at desistance. Carlsson (2012) concludes that in order to understand criminal behavior it is necessary to understand the individual offender by gathering information on his or her life story and immediate circumstances. He also discusses the need for increased study of intermittent cycles, suggesting that, as the great majority of offenders tend to follow a zigzag path, intermittency can be considered to be the norm in criminal careers. Despite this, little is known about the factors that support these intermittent episodes.

Using a retrospective self-report survey based on the life history calendar strategy (LHC), the current study aims to elucidate the zigzag path in criminal careers through a better understanding of the context and circumstances surrounding these intermittent cycles. As Piquero (2008) points out, cross-sectional designs are ineffective for examining intermittent episodes. Using LHC makes it possible to look at the retrospective details of a criminal pattern on a monthly basis. Intermittency can be explained by rational choice theory, which suggests that offenders are rational and respond to incentives (Becker, 1968; Ehrlich, 1973, McCarthy, 2002). This approach, following the expected utility paradigm, also implies that offenders weigh their criminal involvement against the probability of conviction and in relation to punishment if convicted (Ehrlich, 1973). The decision made by offenders incorporates both punishment (costs) and reward (criminal earnings). Becker argues that offending is also modulated by other elements. Offenders take into account available legal and illegal income, the frequency of arrests, and the willingness to commit an illegal act (p. 258). Ehrlich (1973) suggests that participation in illegal

activities can be explained by the search for the optimal allocation of resources accessible under uncertainty. Such an evaluation relies on the individual's perception of a given situation, available resources, and influential experiences, particularly with regard to short-term pursuit of illegal activities. In addition, researchers argue that this process of decision-making is likely to vary across persons over time (McCarthy, 2002; Paternoster & Pogarsky, 2009). This theoretical perspective gives offenders an active role in the decision to quit or continue in crime. The role of active human agent has proven effective in explaining desistance (Giordano, Cernkovich & Rudolph, 2002; Sampson and Laub, 2003) and is crucial for understanding intermittency.

Based on a research design that allows variation across individuals (between-offenders) and over time (within-offenders), the present study examines the impact of events that mark criminal involvement as well as other life circumstances and whether they influence the likelihood that offenders will interrupt their illegal activities. Interruptions from offending, no matter what the reason, are crucial to facilitating more permanent desistance. It is therefore important to know what helps predict them, using predictors from both criminal justice interventions and offender-related/criminal career-related attributes. This study potentially has theoretical implications for both desistance research and life-course criminology.

Criminal Justice Interventions

Personal experience of sanctions appears to be central to understanding criminal paths. For example, judicial experiences may modulate a person's evaluation of the probability of conviction and thus reduce the attractiveness of crime. These direct experiences of punishment act as specific deterrence, defined by Stafford and Warr (1993) as "the effects of legal punishment on those who have suffered it" (p. 123). Punishment may deter offenders by influencing their cost/benefit calculations, encouraging them to avoid criminal involvement. One can thus expect that the experience of sanctions will promote episodes of criminal inactivity. Previous work has looked at the effect of three types of sanctions: imprisonment, surveillance, and arrest.

Imprisonment remains one of the most important forms of sanctions used in modern criminal justice systems (Drago, Galbiati & Vertova, 2009). At the individual level, the principle behind imprisonment is to physically prevent offenders from committing other crimes in the present and to dissuade them from offending once freed. Although policymakers hold that such sanctions are effective in reducing crime, research on the deterrent effects of imprisonment shows mixed results at best. Some studies have found that offenders are sensitive to sanctions and that prison fosters abstinence from crime (Cromwell et al., 1991; Cusson & Pinsonneault, 1986). Drago, Galbiati and Vertova (2009) studied the effect of legislative change on post-release criminal behavior and found that longer expected sentences reduce the probability of recidivism. However, there is an abundant body of literature demonstrating that incarcerating offenders tends to have either a null or a criminogenic effect on both adult (Bales & Piquero, 2012; Nagin, Cullen & Jonson, 2009; Nieuwebeerta, Nagin & Blokland, 2009) and juvenile (Blomberg et al., 2011; Loughran et al., 2009) offenders. This seems to be especially true for offenders involved in lucrative forms of crimes. The results of a study by Nguyen et al. (2016) show that institutionalization may help increase an individual's daily illegal wage rate. The negative effect of incarceration can be explained in several ways: through the influence that prisoners have on each other (prison as a "school of crime") or through the shared conditions of detention (inmates leave the detention facility in an adverse economic situation). It may also provide support for the idea that incarcerated individuals share common characteristics that predispose them to commit crimes (e.g., low self-control).

It can be assumed that the risk of getting caught will be greater during periods when the individual is under surveillance. It can therefore be anticipated that formal supervision by authorities of the justice system will be a deterrent factor for offenders. However, studies using official data on new convictions say little about the "real" offending path and give little insight into the changes experienced by those on probation (Farrall & Calverley, 2006). Three studies using self-report data have looked at the short-term influence of supervision on offending careers. Horney et al. (1995) as well as Ouellet and Tremblay (2014) find that episodes of probation have no effect on criminal involvement over a short-term span,

while McGloin et al. (2007) reach the opposite conclusion, suggesting that in such circumstances offenders restrict, without completely stopping, the number of criminal activities in which they are involved. In other words, episodes of surveillance do not increase abstinence but do encourage caution and moderation.

With regard to arrest, it is assumed that contact with the authorities will have a deterrent effect, reducing the probability of reoffending in response to the perception of an increased risk of detection following an arrest. Relatively few studies have examined the effects of arrest on future criminal behavior (Morris & Piquero, 2013; 839) and even fewer have looked at adult paths (most involve adolescent samples). The research conducted by Anwar and Loughran (2011) looks directly at the link between arrest and risk perception. Based on a longitudinal investigation of the transition from adolescence to young adulthood in a sample of adolescents arrested for serious offenses, they find that juvenile offenders adjust their risk perceptions upward by about 5 percent per arrest on average and that this effect depends on the type of crime for which offenders were arrested. Despite their findings, the idea that arrest is not a deterrent but can encourage reoffending persists (Bernburg, Krohn & Rivera, 2006; Liberman, Kirk & Kim, 2014; Piquero & Pogarsky, 2002; Sherman, 1993). Morris and Piquero (2013) highlight the effect of arrest on a sample of adolescents and assess whether an arrest has the same effect across different types of offenders. They find that an arrest increases subsequent delinquency among greater-risk youth but not among lower-risk youth. The effect of punishment might also depend on how the individual internalizes the event—on how he or she perceives the threat of detection following arrest. For example, Pogarsky and Piquero (2003) use the concept of resetting to suggest an alternative explanation for the criminogenic effect of sanctions. Based on the concept of the “gambler’s fallacy”, which biases judgment and decision-making, individuals who are arrested may come to believe that it is extremely unlikely that they will be rearrested, leading to a decrease in their perceived risk of detection and fostering reoffending.

In general, the literature suggests that the deterrent effect of different types of punishment is mixed, with some studies finding that punishment weakens compliance (Piquero et al., 2011). However,

the risks a person is willing to incur depend not only on evaluation of the probability of conviction but also on the financial return from crime. Viscusi's study (1986) shows a positive relationship between the risks of punishment (incarceration, conviction, arrest) and criminal revenue, demonstrating not only the importance of the risk-rewards linkage in understanding involvement in crime but also that the threat of criminal sanctions influences criminal behavior.

Criminal Achievement

Rational choice theory suggests that not only costs but benefits are considered in making the decision to commit a crime: a context where anticipated rewards are seen to outweigh perceived risks represents a fertile ground for criminal activity. To capture the level of reward that offenders can obtain from their criminal activities, one can look at work on criminal success. The concept of criminal achievement is essentially defined by two objective indicators: criminal earnings and experiences of impunity. Presumably the amount of illegal gain acts as an incentive to continued involvement in crime. Benefits from crime might also create momentum that, like ideas of impunity, promote overconfidence, encouraging offenders to focus on maximizing criminal earnings with the collateral effect of lowering risk perception and increasing the number of crimes committed. The reverse is also true: modest or disappointing earnings may deter offenders, leading them to think that the game is not worth the trouble. The study of criminal proceeds is important, especially if one considers that most criminal activity is motivated by gain (Uggen & Thompson, 2003). Numerous studies have shown that some offenders obtain significant revenues from their crimes (McCarthy & Hagan, 2001; Morselli & Tremblay, 2004; Morselli, Tremblay & McCarthy, 2006; Tremblay & Morselli, 2000). Most research on achievement, however, emphasizes that there are significant variations over time and between individuals with regard to criminal performance (Uggen & Thompson, 2003). To the best of our knowledge, no study has investigated whether these changes and differences in performance have an impact on the continuity of criminal activity—on intermittent cycles. Unlike impunity, there is no study on the direct relationship between

earnings and an increase in offending, although there has been work on how the level of reward from crime influences perceptions of risk (McCarthy & Hagan, 2001).

Stafford and Warr (1993), in their reconceptualization of general and specific deterrence, attach importance to impunity experiences: “offenders acquire experience with avoiding punishment, and that experience is likely to affect their chances of committing crime again” (p. 124). Shover and Thompson (1992) show that offenders’ decisions to stop or to continue criminal activities depend directly on their experience of impunity. The effect of success in avoiding detection is not limited to the continuity of criminal activities—Loughran et al. (2012) argue, based on a sample of serious juvenile offenders, that undetected crimes may prompt overconfidence about perceived risks and therefore a lower perception of risk that can lead to an increase in self-reports of offending. They thus recognize that impunity has the effect of shaping risk assessment decisions by offenders about their illegal activities.

To sum up, events have the power to modulate offender’s future decisions and criminal careers. Fagan and Piquero (2007) found that elements of both risk and reward influenced patterns of offending over time. Other works suggest that the decision-making process is dynamic and that offenders constantly update their perceptions of costs and benefits in determining whether to reoffend (Matsueda et al., 2006).

Current Study

In this paper, we propose an analysis of intermittency cycles in criminal careers. More precisely, we want to examine the merits of two complementary aspects of rational choice theory. The first deals with costs and the effect of specific deterrence and involves not only the impact of past formal sanctions but also the effect that the timing of punishments has on criminal behavior. It is anticipated that sanctions will influence risk perceptions and therefore offenders’ decision to pursue their criminal activities. The second aspect looks at benefits from crime to determine whether variations in success in criminal ventures over time directly affect the probability of offending.

Within this theoretical framework we seek to understand the timing of interruptions to criminal activity within criminal careers and a dynamic analysis of intermittent cycles of criminal activity is proposed. Specifically, we look at whether it is possible to predict the two poles of such interruptions: the month offenders voluntarily interrupt their criminal activities (stop) and the month they reoffend after a period of inactivity (start; recidivism). This examination is based on the criminal justice interventions (specific deterrence) hypothesis, which proposes that the number of months in which offenders are involved in surveillance, arrest, and detention directly influences the probability that criminal activities will be interrupted or resumed. We also test the criminal achievement hypothesis, which suggests that monthly variations in success in avoiding apprehension and in criminal efficiency will directly affect both the beginning of a period of inactivity and the resumption of illegal activities.

Method

Participants

The data analyzed in this study are based on interviews conducted with 262 federal inmates (all male) from five medium and minimum security-level penitentiaries in the area of Montreal.¹ The survey was oriented towards offenders involved in lucrative forms of crime.² Respondents were randomly chosen from a list of inmates who were serving time for sentences that had begun shortly before the interview (76 percent were interviewed less than 2 years after the beginning of their current term). A few inmates could not be interviewed for various reasons but 80 percent of those invited agreed to participate and to take part in face-to-face interviews. The survey collected information on areas that were likely to impact criminal careers, such as criminal and legal activities, including details on earnings, crime frequency and co-offending patterns, arrests, and incarceration periods. Information gathered refers mainly to a 36-month window before the current incarceration. To facilitate reporting activities (legal and illegal) and life events on a monthly basis, the life history calendar (LHC) method was used. The life history calendar was developed by Freedman, Thornton, Camburn, Alwin, and Young-DeMarco (1988)

and elaborated within a longitudinal research framework to record events that occur inside developmental trajectories. It was imported into criminology for the study of criminal careers and has proved to be reliable (Caspi et al., 1996; Griffin & Armstrong, 2003; Horney & Marshall, 1991; Horney et al., 1995; MacKenzie & Li, 2002; Ouellet & Tremblay, 2014; Ouellet & Bouchard, 2017; Sutton et al., 2010; Uggen & Thompson, 2003). Fischer et al. (1989) showed that victims and witnesses of criminal acts are able to provide more precise details about their experiences when they use a method such as LHC, which is aimed at re-creating the specific circumstances surrounding the crime. In the same way, recall of criminal activities is facilitated when inmates visualize the other elements included in the calendars (Morris & Slocum, 2010; Roberts & Horney, 2010). Life history calendars, given their retrospective and self-reported nature, make it possible to model periods of activity/inactivity and parameters of criminal involvement on a monthly basis.

Although 262 criminals were interviewed, the sample in this article is composed of 172 inmates. Inmates were excluded on the basis of missing data in the LHC ($n = 23$) or if they did not report lucrative criminal activity during the 36-month window ($n=45$).³ Inmates who had been active in crime for fewer than three months during the same period ($n=22$) had to be removed because we could not calculate valid measures describing their criminal involvement prior to incarceration.⁴

Data structure and unit of analysis

The data used in this study are nested: months that make up the window period are nested within offenders. As this study examines intermittent cycles of criminal activity, focusing on factors that predict the two poles of episodes of intermittency, intermittency is examined on a monthly basis. Using months as the unit of analysis is in line with the literature that discusses changes in criminal careers (Griffin & Armstrong, 2003; Horney et al., 1995; Ouellet & Tremblay, 2014; Ouellet & Bouchard, 2017; Uggen & Thompson, 2003). Months allow closer attention to how transitions occur over time and make it possible to capture short term changes and to identify the immediate effects of life circumstances. This unit of

analysis is recognized as precise enough to measure both the sequence and the interaction of different events (Robert and Horney, 2009).

Variables considered in this study can be divided according to their nature. On the one hand, there are static factors, characteristics of individuals and their life history that do not vary over time and allow comparisons between individuals. In this study, static factors also refer to factors that could theoretically vary over time but must be considered invariant for different reasons (e.g. because very little change was observed during the period – education – or because dynamic data were not available – drug use). On the other hand, there are dynamic factors that are part of an individual path and vary on a monthly basis; these factors are used to examine changes within the path of an individual.

Measures

Static Factors

Characteristics of offenders and their criminal careers were used to determine what distinguishes those offenders who stopped committing crimes for at least one month during the period being considered as well as those who reoffend after a period of inactivity. Criminal inactivity is defined as months in which detainees were free to commit crimes (months in prison are excluded) but decided, for many reasons, to abstain. The majority of offenders in our sample (62%) experienced at least one episode of criminal inactivity, with an average period of inactivity of 11 months.

The number of past incarcerations was used to measure long-term effects of criminal justice interventions: on average, those in the sample had experienced 1.8 episodes of incarceration before the period under consideration. It is conceivable that offenders who have experienced several episodes of incarceration are less inclined to take risks or are simply exhausted by the criminal lifestyle (going back and forth between prison and the outside world), resulting in a higher probability that they will interrupt their criminal activities. The model takes into account differences between respondents on a number of characteristics antecedent to the period under observation and potentially associated with episodes of

criminal inactivity: age at the beginning of the period, high-school education, and low self-control.

Parameters that affect or define criminal involvement were also included: age at onset of criminal activity and size of criminal network. Descriptive statistics of these variables are presented in Table 2.

Dynamic Factors

In investigating the timing that frames the beginning and the end of episodes of criminal inactivity, we focus on segments (sequences of months) within offender paths that are specific to these two events. The logic is simple: the observed event (the beginning or end of a period of criminal inactivity) must have a chance to occur (e.g., you cannot start an episode of criminal inactivity when already criminally inactive). Also, analyses involve only changes during months of freedom, excluding months in prison.⁵ Table 1 summarizes the information analyzed for each of these events.

[Table 1 about here]

Start and Stop Points of an Episode of Criminal Inactivity. To study the onset of a sequence of criminal inactivity, we examined the circumstances that explain the interruption of criminal activity, concentrating on months when offenders were involved in crime and on the first month of the beginning of a period of criminal inactivity, whether it occurs or not. We tried to predict the occurrence of inactivity. Data from the sample showed that nearly two out of three offenders had at least one month of criminal inactivity. Those who experienced at least one period of criminal inactivity during the window period had on average two (1.8) distinct episodes, lasting on average six consecutive months (6.1).

We also looked at events at the end of the episode of inactivity and resumption of criminal activity to determine the factors and circumstances that affect recidivism. Using the self-report-based LHC makes it possible to avoid a major limitation in the study of recidivism based on official data by including information on whether offenders were criminally active or inactive during the months they were not under arrest (Ouellet et al., 2013). The focus here is on months of inactivity and whether it is possible to predict the occurrence of the first month in which recidivism is recorded. If we consider only offenders who report at least one episode of criminal inactivity during the period under consideration, we find that

the vast majority (84.1%) also resumed criminal activity. This descriptive result shown in Table 2 clearly demonstrates that the period of criminal inactivity was usually temporary.

Criminal Justice Interventions. Three indicators were used to measure the effect of criminal justice interventions. The first is surveillance, as formal monitoring may deter offenders from committing crimes, making it more likely that they will interrupt their illegal activities. Surveillance applies to the months within the window period during which offenders were either under probation or under conditional release, as well as the months during which they lived in halfway houses. A total of 38.4% of offenders spent at least one month under surveillance with an average length of supervision of 10 months. The two other measures reflect events that happened in the previous month and can be expected to influence continuity of criminal involvement in the present month. The deterrent effect of incarceration is examined as it is expected that the number of months spent incarcerated during the window period will affect criminal inactivity or recidivism. During the 36-month period, almost two thirds of offenders experienced an episode of incarceration, lasting an average of 10 months. In looking at the third factor, arrest, to determine whether arrest in the previous month had a deterrent effect, every month in which offenders were criminally active was coded for the presence or absence of an arrest. The majority of offenders in our sample (83.7%) were arrested at least once during the window period. On average offenders were arrested 1.6 times and the arrest occurred, on average, after 12.5 months of criminal activity.

Criminal Achievement. The second hypothesis in this research is that monthly variations in criminal achievement influence the continuity of illegal activities as occasional success has the effect of encouraging criminal activity. Both indicators (criminal efficiency and apprehension avoidance) assume that success in a previous month influences behavior in the following month. Experience of impunity has the effect of shaping the assessment of risk exposure, leading to an extension of criminal involvement.

Shover and Thompson (1992) emphasize that offenders' decisions about whether to desist or continue in their criminal activities depend on their experience of impunity. Hierarchical models are well suited to studying the ability of offenders to avoid arrest based on retrospective data from their criminal careers. The sense of impunity over time was calculated in the same way as a batting average in baseball: if an offender is active for ten months before being arrested for the first time, his relative success in avoiding arrest is 100% for the months before being arrested (9 out of 9) and 90% the following month (9 of 10). If he continues his criminal activities for five months before being arrested again, his ability to avoid police contact decreases to 87% (13 of 15). The measure of the sense of impunity thus varies on a monthly basis. The average success of our sample in avoiding apprehension during the window studied was 88%, with a standard deviation of 27%. Criminal efficiency was assumed to be the best indicator of both criminal achievement and competence in this sample. Following Tremblay and Morselli (2000), criminal efficiency was measured as the average payoff per crime, calculated by dividing total illegal earnings by the total number of crimes committed each month in which offenders were active. Respondents reported on average a pay-off of \$245 per offense.

[Table 2 about here]

Among factors that vary on a monthly basis, conventional life circumstances as well as parameters that characterize the criminal career were controlled for. A significant proportion of offenders (61%) reported having held a legitimate job during their months of criminal activity. In months where criminal earnings are not the only source of income, offenders may have more freedom to consider various criminal opportunities, choosing those that appear more interesting with regard to risk and rewards. The average proportion of months living with an intimate partner was 43%. In terms of costs, it should also be noted that a good body of research suggests that informal sanctions (opinions of romantic partners, work, friends, family, etc.) play a non-trivial role in desistance (e.g., Sampson, Laub & Wimer, 2006). Therefore, it is possible that work and intimate relationships influenced the intermittency of criminal activity.

The first parameter of criminal involvement measures the Lambda of criminal activity. Intensity is measured by the frequency of crimes committed each month. Respondents reported an average of 31 crimes per month. The second measure captures the monthly change in criminal opportunities, as determined by changes in the number of illegal activities in which offenders were involved monthly. Inmates who participated in the survey were asked to list the sectors in which they had participated during the window period (types of criminal markets and types of crimes against property). During the months of criminal activity, offenders were, on average, involved in two different areas of criminal activities (mean = 1.82, SD = 1.04).

Analytic Strategy

Generalized linear mixed (GLM) models were used to test the two main hypotheses of this study. GLM models are used to identify the antecedent factors (static factors) and intervening factors (dynamic factors) that have a direct effect on the probability that there will be a start or a stop to an episode of criminal inactivity. The logic behind GLM is similar to logistic regression. These models make it possible to examine intra-individual changes in life circumstances as well as differences between offenders. Data on individuals obtained at regular intervals can be regarded as being structured hierarchically: months of criminal activity are nested within individuals. This type of analysis is distinguished by its flexibility (Willett et al. 1998), which is useful for this study, since the number of months being observed varies from one individual to another, as the context surrounding the examination of intermittency within criminal careers requires the analysis of specific sequences of months and the removal of certain months within an offender's path. HLM version 6.06 (Scientific Software International, Inc., Skokie, IL, USA) was used in this study.

Results

When Do Offenders Stop?

As noted above, the first step in the multilevel model is to determine the context or conditions associated with the month offenders voluntarily interrupt their criminal activities (stop). The results presented in Table 3 show that most criminal career parameters and all conventional life circumstances in the previous month are not predictive of interruption of criminal activities. Being employed, being in a relationship, or the number of crimes committed in the previous month do not appear to directly influence the onset of an episode of criminal inactivity. The only exception in this regard is diversification of criminal activities: when the fields of activity in which offenders are involved have decreased in the previous month, it is more likely that they will cease their criminal activity. Individual characteristics (static factors) also have limited use in predicting the beginning of a sequence of criminal inactivity. Only the size of the criminal network appears to matter. The results also indicate that offenders who have fewer partners in their criminal network are generally more likely to interrupt their criminal activities.

Model 1 in Table 3 tests the criminal justice interventions hypothesis by introducing indicators of past formal sanctions. This model allows us to observe the effect of past sanctions as well as those that occurred during the thirty-six-month period. Model 1 shows that an increase in the number of months spent in incarceration, either during the window period or overall, has no impact and does not discourage offenders from further criminal activity once they are free. However, in accordance with ideas about specific deterrence, results show that arrest itself has an effect: odds of beginning a period of criminal inactivity increased by a factor of 13 in the presence of an arrest in the previous month, compared to no arrest. (During this time the majority have been released on bail or on their own recognisance so continuing their criminal career is possible.⁶) In addition, this desistance cannot be interpreted as an effect of incapacitation, as only months of freedom are considered in this analysis.

[Table 3 about here]

When variables related to criminal achievement are introduced it can be seen that offenders who have experienced success in the previous month—who have profited from crime and succeeded in avoiding contact with authorities—are less likely to interrupt their criminal activities. The effect of

efficiency is surprisingly absent from the study of the criminal career framework (Ouellet & Bouchard, 2017), but the idea that offenders have differing abilities when it comes to crime and that these skills have a bearing on criminal careers remains an interesting possibility to investigate.

When Do Offenders Start Again?

Having considered the circumstances surrounding the beginning of an episode of criminal inactivity, it is interesting to examine what affects the recommencement of criminal activity. In order to deal with recidivism, only criminal paths marked by at least one interruption are analyzed. However, analyses attempting to ascertain whether offenders who interrupt their criminal activities during a three-year period differ from those whose paths do not show any interruptions has shown that desisting offenders differ from those who are constantly active in crime (defined as offenders who committed at least one crime in each month of the window period) only in having smaller criminal networks ($p < .01$). To predict recidivism, sequences of months of inactivity from crime and the first month criminal activity resumes were analysed. As the analysis deals with months of criminal inactivity, models cannot include monthly parameters of criminal involvement. Two new dynamic indicators were therefore created. The first indicates whether the sequence of criminal inactivity followed a period of incarceration (yes or no). The second follows the same logic and examines whether criminal inactivity was preceded by an arrest. These two indicators allow us to observe the short-term effect of criminal justice interventions.

To take into account parameters of criminal involvement, we created aggregated measures (static factors) that reflect the monthly mean of the frequency of crimes committed and the diversification of criminal offenses. Offenders who have been more successful in general (criminal earnings, experience of impunity) might be more likely to resume their criminal activities. Criminal achievement was represented by two predictors—mean of criminal efficiency and mean of success in apprehension avoidance—aggregated measures that capture average success during the window period.

With regard to the relationship of static determinants to the timing of when offenders stop, younger offenders are more likely to reoffend during episodes of inactivity. Analyses also highlighted the influence of the size of criminal networks; individuals who rely on a wider network are more likely to reoffend. These results suggest that intermittent cycles are influenced (stop and start) by the ability to diversify criminal opportunities but also by the resources to seize these opportunities. In other words, an extended period of inactivity could reflect a lack of resources or interesting opportunities rather than a willingness to abstain from crime.

[Table 4 about here]

The results in Table 4 suggest that living with a partner does not predict the timing of reoffending. Change in involvement with legitimate work does, however, appear to be a key factor in determining recidivism. Previous analyses indicate that working does not encourage offenders to stop criminal activity but holding a legitimate job contributes to continuing abstinence from crime. During periods of inactivity, odds of reoffending are 2.43 times less when offenders are working as compared to not working.

Objective measures of criminal achievement had a significant impact on the beginning of an episode of inactivity (model 2 in Table 3), which is not the case for the beginning of a period of reoffending. Model 4 in Table 4 shows that average success in avoiding arrest and average payoff per crime during the period studied do not influence the likelihood of recidivism. Reoffending is better explained by specific deterrence.

Indicators developed to assess the short-term effect of criminal justice interventions showed an influence on recidivism. However, these effects are in opposite directions. Offenders were more likely to resume their criminal activities when the episode of inactivity was preceded by a period of incarceration. To be more precise, offenders released from prison are 2.09 times more likely to reoffend, compared to staying inactive. This result is in line with previous studies showing the criminogenic impact of imprisonment (Bales & Piquero, 2012; Nieuwebeerta, Nagin & Blokland, 2009). Arrest has the opposite

effect: odds of reoffending are 2.03 times less when the inactive period was triggered by an arrest. This suggests that arrest may have at least a temporary deterrent effect on recidivism.

Discussion

The results in this study highlight the relevance of the rational choice perspective to understanding intermittent cycles in criminal careers. The focus is on the two dimensions of this theoretical perspective that might guide an offender's actions – costs and benefits. The analysis looked at not only the general effect of these two dimensions on the probability of taking a break from crime but also their influence on both ends of an episode of criminal inactivity – starting or stopping. More specifically, it shows the importance of criminal justice interventions and criminal achievement in understanding offending paths. The findings also point to several important aspects of these two theoretical constructs in explaining the intermittency of offender paths.

With respect to specific deterrence related to criminal justice interventions, events that occurred before the window period, such as the number of past incarcerations, had little impact on criminal careers. Sanctions had more effect in the short term, highlighting the potential deterrent effect of arrest. Not only were offenders more inclined to stop committing crimes in the month following an arrest, regardless of their level of criminal success, they were also less likely to reoffend after a period of inactivity. The findings suggest that arrest may immediately influence individuals' perception of the risk of detection. This observation supports many empirical studies that have established a link between risk perception and punishment experience (Anwar & Loughran, 2011; Pogarsky & Piquero, 2003; Pogarsky et al., 2004). The finding that incarceration does not have a disruptive effect on a sequence of criminal activities also supports numerous studies (Bales & Piquero, 2012; Nagin, Cullen & Jonson, 2009; Nieuwebeerta, Nagin & Blokland, 2009), emphasizing that time spent in a penal institution does not have the expected outcome on offenders' paths. The study did not evaluate assumptions that incarceration represents a learning opportunity or a place to locate co-offenders ("schooling process"), but does suggest that this type of

event in a criminal career does not provide a form of social control that extends beyond prison walls. As argued by Nguyen et al. (2016), it is possible that incarceration has more benefits for offenders who are involved mainly in lucrative forms of crime. Our findings further highlight the importance of understanding the consequences of incarceration.

It is also clear that the benefits associated with crime matter in decisions about criminal activity. Shover and Thompson (1992) have shown the existence of a strong link between past success in sanctions avoidance and criminal desistance: those who are successful are less likely to stop their criminal activities. This study adds to their work by showing that it is not only avoiding punishment that influences intermittency but also the amount of earnings derived from crimes. Knowing an offender's level of earnings during the window period made it possible to predict whether his criminal path would be intermittent: offenders who were more successful were less likely to deviate from their criminal path. Criminal effectiveness and success in apprehension avoidance in the previous month were associated with the pursuit of criminal activity. These results support the concept of overconfidence put forward by Loughran et al. (2012), showing that both repeated experiences of impunity and criminal earnings promote continuity of criminal activity, suggesting that these two indicators of criminal achievement can modulate perceptions of risk.

The analysis makes clear the importance of timing in understanding zigzag paths. In showing that circumstances in preceding months greatly influenced the dynamics of criminal careers, the results are in line with those of Skardhamar and Savolainen (2014), who demonstrate that timing is crucial in understanding the relationship between employment and desistance. Although it is clear that timing is not affected only by immediate circumstances and that cumulative experience as well as past specific events may also have an effect on an offender's decision, the fact remains that the results of this study demonstrate that short-term events—the effect of arrest and of success in crime—are important to understanding intermittent sequences in the particular circumstances of criminal careers. These observations are consistent with our knowledge of persistent offenders, who are frequently described as

impulsive and affected by the present moment. Some offenders seem to have a short memory about past sanctions and successes when an opportunity arises and this characteristic can be captured only by a dynamic design (Piquero, Farrington & Jennings, 2016). In addition, the models considered in this study make clear the difficulty of using static factors to predict events that take place as part of a path. The study thus showcases the usefulness of life history calendars as an instrument that makes it possible to capture monthly variations in criminal (in)activity.

Some limitations of data and analysis need to be taken into consideration when interpreting the results. This research focuses on the criminal career of offenders involved in lucrative forms of criminal activity, which obviously limits the scope of our results, particularly in regard to the relationship between theoretical constructs and offending outcomes studied in this research. For instance, the findings might partly reflect the nature of this particular sample of incarcerated offenders, all of whom were “failed” offenders (Jacobs & Wright, 2006; Wright & Decker, 1997). Such individuals might be more willing to temporarily interrupt their illegal activity or to persevere in a criminal path even if it is not successful as they may lack better options; the extent or validity of these assumptions cannot, however, be addressed in this research, suggesting that the present study should be replicated with a sample of active offenders. Another limitation of this study is that it does not make it possible to consider offender perceptions directly. It would be interesting to further explore individual perceptions of success and risks and how these subjective indicators are influenced by actions, events, and circumstances. It is also important to note that the analyses determine only whether months following an incarceration period favored (or not) a return to crime but do not take into account the conditions of detention and time served. Nor do they allow us to consider other functional relationships between recidivism and incarceration (for more details, see Mears et al., 2016). Also, the study by Horney, Osgood, and Marshall (1995) finds that monthly changes in drug and alcohol use have a strong effect on month-to-month changes in criminal activity. Given that drug and alcohol use are likely to be related both to commission of economic crimes and risk of arrest, the inability to measure these variables on a monthly basis is a limitation of the study. In

addition, it would have been desirable to have included additional dynamic measures (e.g., information on habits of co-offending and alcohol/drug use). The same is true for the size of criminal networks. A dynamic measure of criminal networks would have made it possible to examine the effect of changes in this area (e.g., the addition of a new contact, incarceration of members of the network) on the criminal career. Finally, although previous studies have found life history calendars to be valid, the data underlying this study depends on the memory of participants and we must assume that retrieval capacities are not constant from one individual to each other, variations that represent a limitation of this study.

Conclusion

This study highlights the importance of both dissuasive events and criminal success in understanding the dynamics of offending careers in the short term. Consideration of data from a relatively homogeneous sample of offenders involved in lucrative forms of crime suggests that the conditions behind interruption are not necessarily the same as those that operate in recidivism. The findings also highlight the importance of considering the motives that affect decisions to commit crimes (illegal earnings and avoiding arrest). More specifically, success in illegal ventures has the potential to increase confidence and may influence other parameters of the criminal career (e.g., crime frequency, duration of criminal path, desistance). While this study highlights the contribution of considering the motive behind crimes, a decision that was affected by the nature of the crimes committed by the offenders being studied, there are many other reasons that may encourage illegal behavior (see Katz, 1988). For, example, in terms of benefits, research also underscores that crime can provide emotional returns (Katz, 1988; Matsueda et al., 2006), as well as status and respect (Matsueda et al., 1992). It would therefore be relevant to look at these elements to see what effect they have on the understanding of criminal careers. This might involve asking offenders directly about what prompted their crimes (e.g., revenge, personal challenge) and observing the effect of these motives on the continuity of offending paths—in other words, paying attention to the subjective experiences that affect criminal careers. This study also suggests several other

lines of inquiry that deserve further study. In particular, it would be interesting to go more deeply into the effect of incarceration by not only looking more closely at offenders during their stay in prison but also by examining their criminal careers following their release to determine, for example, if they take advantage of new criminal opportunities or if they become more effective in committing crimes. Finally, it would be interesting to examine the role (if any) of episodes of intermittency and their particular characteristics (e.g., length, circumstances behind them) in sustaining desistance from crime to extend our understanding of the process behind the end of criminal careers.

¹ These are offenders serving sentences of more than two years. In Canada, the federal system has jurisdiction over adult offenders serving sentences of two years or more.

² The various money-oriented crimes reported include robbery, burglary, vehicle theft, theft, fraud, economic crimes, other offenses involving goods, drug selling and distribution, fencing, and other market-related offenses (e.g.: smuggling, loan sharking, procuring, and illegal gambling).

³ As it was a research project on criminal achievement, the interest was only on offenders who committed crimes directed towards monetary benefits (successfully or not). These individuals were excluded because they did not meet this criterion.

⁴ Means tests were conducted to evaluate the extent of the differences between included and excluded individuals. Of all variables incorporated in the analyses, only low self-control, number of criminal contacts, and payoffs per crime were found to differ significantly: excluded offenders had higher levels of self-control ($p < .01$), fewer numbers of criminal contacts ($p < .05$), and a lower mean payoff per crime ($p < .01$) as compared to included offenders.

⁵ It might be interesting to broaden the perspective of this study and look at the dynamic of life circumstances that might influence the **path** of offenders during their incarceration. Interesting episodes during detention are beyond the scope of this study to the extent that imprisonment is a “world apart” that redefines relations of employment, terms of remuneration, extent of criminal diversification, offender status, marital relations, etc.

⁶ This result cannot be an incapacitation effect as we analyze only months where offenders are free to commit crimes; months spent in prison/penitentiary are excluded from analysis.

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Table 1. Sequence Observed for the two Events

	Months included	Months excluded
Start an episode of temporary desistance	1) months where criminal activity is recorded 2) first month in which an episode of temporary desistance occurs (this month precedes a period of criminal activity of a month or more)	1) months of temporary desistance sequence (except the first month) 2) first month where offenders started a new sequence of criminal activity 3) months of incarceration
Stop an episode of temporary desistance (recidivism)	1) months of the temporary desistance sequence (except the first month) 2) first month in which a new sequence of criminal activity is started	1) months where criminal activity is recorded 2) first month of an episode of temporary desistance 3) months of incarceration

Table 2. Descriptive Statistics for Dynamic and Static Variables

	Mean (SD) or n (%)
Start an episode of criminal inactivity (1 =yes; 0=no)	257 (8.1%)
Stop of criminal inactivity (recidivism) (1 =yes; 0=no)	178 (10.1%)
<u>Level 1: Dynamic Factors - (N=3179)</u>	
Living with an intimate partner (1 =yes; 0=no)	1380 (43.4%)
Legitimate work (1 =yes; 0=no)	1316 (41.4%)
Lambda (previous month) (number of crime committed in the last month)	30.59 (10.87)
Diversification (previous month) (number of distinct criminal activities in the last month)	1.82 (1.04)
Surveillance (1 =yes; 0=no)	622 (19.6%)
Number of months spent in detention (cumulative months in detention during WP)	2.34 (5.03)
Arrest (previous month) (1 =yes; 0=no)	173 (5.4%)
Success in apprehension avoidance (previous month) (months without arrest / months of criminal activities)	.88 (.23)
Criminal efficiency (previous month) (earnings per crime in the last month)	245.28\$ (16.44)
<u>Level 2: Static Factors - (N=172)</u>	
Episode of criminal inactivity during the window period (1 =yes; 0=no)	107 (62.2%)
Age (at beginning of window period)	32.37 (8.51)
High school diploma (1= graduated; 0=did not graduate)	32 (18.6%)
Low self-control (sum of the 24 items on the Grasmick's scale)	80.28 (14.47)
Daily use of alcohol (1 =yes; 0=no)	49 (28.5%)
Hard drug uses monthly (1 =yes; 0=no)	100 (58.1%)
Onset (age at first crime)	15.20 (6.81)
Size of core criminal network ^a (number of partners in the core criminal network)	6.92 (3.00)
Past incarceration (number of episode of incarceration before WP)	1.79 (1.52)

Table 3. Multi-Level Logistic Regression Predicting the Start of an Episode of criminal inactivity

Start of an episode of criminal inactivity	Model 1 Effect of specific deterrence		Model 2 Criminal achievement	
	γ	OR	γ	OR
Level 1: dynamic predictors (N=3179)				
Living with a intimate partner	0.26 (0.30)	1.303	0.25 (0.30)	1.286
Legitimate work	-0.11 (0.35)	0.892	-0.11 (0.34)	0.899
Lambda (previous month)	-0.00 (0.00)	0.999	-0.00 (0.00)	0.999
Diversification (previous month)	-0.79** (0.28)	0.454	-0.71** (0.27)	0.491
Surveillance	0.32 (0.27)	1.379	0.23 (0.28)	1.254
Number of months spent in detention (cumulative over WP)	-0.02 (0.02)	0.983	-0.02 (0.01)	0.981
Arrest (previous month)	2.61*** (0.28)	13.621	2.59*** (0.30)	13.344
Success in apprehension avoidance (previous month)			-1.02*** (0.27)	0.361
Criminal efficiency (previous month)			-0.28* (0.11)	0.752
Level 2: Static predictor (N=172)				
Age	-0.03 (0.02)	0.968	-0.03 (0.03)	0.979
Educational level	-0.09 (0.42)	0.910	-0.01 (0.42)	0.896
Low self-control score	-0.02 (0.01)	0.979	-0.02 (0.01)	0.983
Heavy drinking	-0.67 (0.40)	0.507	-0.66 (0.40)	0.518
Monthly use of hard drugs	-0.01 (0.36)	0.999	-0.04 (0.36)	0.960
Onset	-0.00 (0.03)	0.992	-0.00 (0.02)	0.993
Criminal network	-0.34* (0.15)	0.712	-0.32* (0.15)	0.723
Past incarceration	-0.01 (0.12)	0.996	-0.02 (0.12)	0.896

* = $p < .05$; ** = $p < .01$; *** = $p < .001$ (standard errors are in parentheses)

Table 4. Multi-Level Logistic Regression Predicting a Stop to an Episode of criminal inactivity (Recidivism)

Stop of criminal inactivity (recidivism)	Model 3 Effect of specific deterrence		Model 4 Overall Criminal achievement	
	γ	OR	γ	OR
Level 1: dynamic predictors (N=1771)				
Living with a intimate partner	-0.43 (0.26)	0.653	-0.45 (0.27)	0.639
Legitimate work	-0.89*** (0.23)	0.411	-0.86*** (0.23)	0.424
Surveillance	0.41 (0.24)	1.507	0.37 (0.24)	1.443
Incarceration just prior to criminal inactivity	0.79** (0.30)	2.200	0.74* (0.31)	2.090
Arrest just prior to criminal inactivity	-0.68* (0.30)	0.509	-0.71* (0.32)	0.493
Level 2: Static predictor (N=107)				
Age	-0.04** (0.02)	0.958	-0.04* (0.02)	0.961
Educational level	-0.41 (0.32)	0.666	-0.39 (0.35)	0.675
Low self-control score	-0.00 (0.01)	0.999	-0.00 (0.01)	0.997
Heavy drinking	0.01 (0.28)	1.006	-0.12 (0.31)	0.891
Monthly use of hard drugs	-0.01 (0.26)	0.989	-0.01 (0.26)	0.992
Onset	-0.01 (0.01)	0.992	-0.01 (0.01)	0.989
Mean of crime committed	-0.15* (0.07)	0.858	-0.11 (0.08)	0.898
Mean of diversification	0.24 (0.29)	1.275	0.21 (0.31)	1.229
Criminal network	0.25* (0.10)	1.279	0.24* (0.11)	1.272
Past incarceration	0.11 (0.08)	1.119	0.12 (0.09)	1.129
Mean of criminal efficiency			0.07 (0.05)	1.077
Mean of success in avoiding arrest			-0.01 (0.01)	0.994

* = $p < .05$; ** = $p < .01$; *** = $p < .001$ (standard errors are in parentheses)