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Longitudinal and Criminal Career Research in Japan

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Abstract Longitudinal research on the development of criminal careers has rarely been carried out in Japan. This article reviews the advantages and problems of longitudinal research, major international longitudinal surveys, and key conclusions about criminal careers. It then discusses results obtained in a study of the recidivism of over 700 male Japanese sex offenders against young children. It was estimated that 24 % of these men would be rearrested for sex offenses within 5 years after release. Older offenders and those on parole were less likely to offend. The article then discusses the criminal careers of two large samples totalling 1,700,000 Japanese offenders. The crime rate (the age-crime curve) was consistently higher for the 1935 birth cohort than for the 1950 birth cohort. The article concludes by reviewing new longitudinal research that is tracking the criminal careers of ex-inmates of Japanese training schools.

Keywords Japan · Longitudinal survey · Criminal career · Recidivism · Age-crime curve

Introduction

Longitudinal research in criminology is concerned with the development of criminal careers and with the influence of risk and protective factors and life events on the course of development of offending. It is very important and has been conducted in many different countries, but rarely in Japan. The main aim of this article is to encourage longitudinal research in Japan. The first part summarizes longitudinal research in criminology and discusses some key findings. The second part describes criminal career research in the National Research

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Institute of Police Science. The third part discusses criminal career and longitudinal research in the Ministry of Justice.

Prospective Longitudinal Surveys

Advantages

Prospective longitudinal surveys involve repeated measures of the same people. Therefore, they involve at least two data collection points. The word "prospective" implies that risk and protective factors are measured before outcomes. Risk factors predict a high probability of an undesirable outcome such as offending, whereas protective factors predict a low probability of offending in the presence of risk.

The most important prospective longitudinal surveys focus on community samples of hundreds of people, with repeated personal interviews spanning a period of at least 5 years (Farrington 1979; Farrington and Welsh 2006). We focus on community surveys (as opposed to surveys of offenders) because they are needed to study the natural history of offending and the effects of risk or protective factors and life events. In order to avoid retrospective bias, it is important to measure risk and protective factors before the development of offending and to calculate prospective probabilities. Therefore, we focus on prospectively chosen samples rather than retrospectively chosen ones. We require follow-up interview or questionnaire data because we believe that official record data cannot provide adequate information on offending, risk and protective factors, and life events. The best surveys collect data from several different sources, such as the participants, their parents, teachers, peers, and records. We set a minimum of a 5-year follow-up period because we think that at least this period is required to provide minimally adequate information about the natural history of development of offending. Of course, many prospective longitudinal surveys of offending extend for much longer, for 30–40 years or more (see, e.g., Farrington and Pulkkinen 2009; Laub and Sampson 2003).

In criminology, the main advantage of these longitudinal surveys is that they provide information about the development of criminal careers over time, including data on ages of onset and desistance, frequency and seriousness of offending, duration of criminal careers, continuity or discontinuity of offending, and specialization and escalation. They also provide information about developmental sequences, within-individual change, effects of life events, and effects of risk and protective factors at different ages on offending at different ages (Farrington 2003a; Loeber and Farrington 1994). A great advantage of longitudinal compared with cross-sectional surveys is that longitudinal surveys provide information about time ordering, which is needed in trying to draw conclusions about causes.

Problems

While prospective longitudinal surveys have many advantages, they also have problems. The main challenge is to draw convincing conclusions about causal effects (see Murray et al. 2009). Because of their focus on naturalistic observation, longitudinal surveys find it difficult to disentangle the impact of any particular variable from the effects of numerous others. It is particularly difficult to rule out selection effects; for example, child abuse may predict delinquency because antisocial parents tend to abuse their children and also tend to have

delinquent children, without there being any causal effect of child abuse on delinquency. A popular method of ruling out selection effects is to use propensity score matching (Theobald and Farrington 2009). Few researchers have tried to study the effects of life events by following people up before and after them in within-individual analyses.

Other problems can be overcome more easily. Attrition is a problem in some longitudinal surveys, but others have very high response rates (Farrington 2003b; Farrington et al. 2006). The infrequency of data collection often makes it difficult to pinpoint causal order, although some studies (e.g., the Pittsburgh Youth Study: see Loeber et al. 2008) have many years of repeated assessments. Testing effects can also be problematic; these refer to the effect of completing one assessment (e.g., a questionnaire or an interview) on a subsequent assessment. For example, it is commonly found that self-reported delinquency admissions are greater in a first assessment than subsequently, especially if participants realize that each admission triggers further questions and therefore prolongs the interview. The importance of testing effects can often be estimated (Thornberry 1989). It is sometimes difficult to determine if changes (e.g., in offending) over time are attributable to aging, changing time periods, or changing birth cohorts, and the length of time before key results are available is sometimes a problem. These difficulties can be overcome by following up multiple cohorts in an accelerated longitudinal design.

What Did We Know?

Farrington (1979) carried out one of the first detailed reviews of longitudinal studies in criminology. He focused on prospective community surveys of at least several hundred people, with measures of offending, and with a follow-up of at least 5 years involving face-to-face interviews or questionnaires. The most important surveys are those with large numbers of participants, a long-term follow-up, frequent assessments from different sources, and a great deal of information about offending. In general, large omnibus national surveys such as the U.K. National Child Development Study (Bowles and Florackis 2012) have provided little information on offending, whereas smaller focused city-based surveys such as the Cambridge Study in Delinquent Development (Farrington et al. 2013) have produced hundreds of articles on offending.

Many of the early surveys have been followed up to the present. Table 1 shows the nine surveys with the above characteristics (e.g., community surveys of at least several hundred participants with personal contacts) that have followed up a sample of children or adolescents at least to age 40, with repeated assessments including measures of offending. These surveys were carried out in six different countries. The Cambridge Study in Delinquent Development had the most face-to-face interviews (nine, over a 40-year period from age 8 to age 48). The Cambridge-Somerville Youth Study was a longitudinal-experimental project, with an experimental intervention followed by a long-term follow-up. It was the first large-scale randomized experiment in criminology.

The early longitudinal surveys advanced knowledge especially about criminal careers. In particular, the high prevalence of arrests or convictions of males that was discovered in these surveys was shocking to many. For example, in Philadelphia, Wolfgang et al. (1972) found that 35 % of males were arrested before their 18th birthdays and 43 % were arrested before their 27th birthdays; half of the non-whites and 29 % of the whites were arrested before age 18. In the Cambridge Study in London, 21 % of males were convicted by age 16, and 41 % by age 50 (Farrington et al. 2006).

Table 1 Long-term longitudinal surveys

Investigator, title	Initial sample	Follow-ups
McCord, Cambridge-Somerville Youth Study	650 males, average age 10 in 1939 (Boston, USA)	Interviews, questionnaires, records at average age 48 in 1975–1979 (McCord 1990)
Werner, Kauai Longitudinal Study	698 children, born 1955 (Kauai, Hawaii, USA)	Five assessments and records up to age 40 (Werner and Smith 2001)
Eron/Huesmann, Columbia County Study	876 children, age 8 in 1959–1960 (New York State, USA)	Three interviews and records up to age 48 (Huesmann et al. 2009)
West/Farrington, Cambridge Study in Delinquent Development	411 boys age 8–9 in 1961–1962 (London, UK)	Nine interviews up to age 48, records up to age 56 (Farrington et al. 2013)
Magnusson/Stattin/Andershed, Individual Development and Adaptation	1027 children age 10 in 1965 (Orebro, Sweden)	Questionnaire and record data up to age 43–45 (Bergman and Andershed 2009)
Pulkkinen, Jyvaskyla Longitudinal Study	369 children age 8–9 in 1968 (Jyvaskyla, Finland)	Five follow-ups to age 42, with interviews, questionnaires, records (Pulkkinen et al. 2009)
Venables/Raine, Mauritius Child Health Project	1795 children age 3 in 1972 (Mauritius)	Seven interviews up to age 40 (Raine et al. 2010)
LeBlanc, Montreal Two Samples Longitudinal Study	3070 adolescents age 12–16 in 1974 (Montreal, Canada)	Seven interviews and records up to age 50 (LeBlanc and Frechette 1989)
Elliott/Huizinga, National Youth Survey—Family Study	1725 adolescents age 11–17 in 1976 (national US sample)	Interviews up to 2002–2003 (age 38–44) and arrest records collected (Elliott 1994)

The early surveys revealed considerable continuity in criminal careers. In London, 61 % of juvenile delinquents (convicted up to age 16) were reconvicted before age 21 (Farrington and West 1981), while in Philadelphia, 44 % of juvenile delinquents (arrested up to age 17) were rearrested before age 27 (Wolfgang 1973). Offenders were also versatile, both in the variety of crimes they committed and also in their antisocial behavior. In London, boys convicted up to age 18 tended to be heavy drinkers, heavy smokers, drug users, heavy gamblers, sexually promiscuous, very aggressive, and reckless drivers, and they tended to have unstable, low status job histories.

The greatest advances in criminal career research were achieved in the National Academy of Sciences panel report (Blumstein et al. 1986). This described the key parameters of a criminal career (e.g., prevalence, onset, frequency, termination, specialization, escalation) and set out simple mathematical models that explained and predicted the number of crimes committed. This early research has recently been updated by MacLeod et al. (2012).

What Do We Know Now?

Farrington (2013) updated his earlier 1979 review of longitudinal studies. Later research has continued to study criminal careers, especially using self-report information. For example, Elliott (1994) used his Presidential Address to the American Society of Criminology to review results obtained in the US National Youth Survey on the prevalence, onset, and continuity of serious violent offending (according to self-reports). In the Pittsburgh Youth Study, Loeber

et al. (2008) compared prospective age-crime curves based on reported offending (by boys, mothers, and teachers) with similar curves based on arrests and convictions. They found that the prevalence, frequency, and duration of criminal careers were all greater for reported offending than for arrests and that the escalation from minor to more serious crime was greater for reported offending than for arrests. Also, there were differences in offending between different birth cohorts; boys who became teenagers during a period of high societal violence tended to be more violent themselves than boys who became teenagers when societal violence was lower (Fabio et al. 2006).

As longitudinal surveys have followed up participants to older ages, the interest has tended to shift from onset to desistance and from early onset to later adult onset. The burgeoning knowledge about desistance has been reviewed by Kazemian and Farrington (2010) and by Bushway and Paternoster (2013). In general, the most important influences on desistance are getting married, becoming employed, joining the military, and breaking up with delinquent peers (see, e.g., Sampson and Laub 1993). Following the seminal work of Moffitt (1993), there has also been a great deal of interest in types of offenders and especially in adolescence-limited versus life-course-persistent offenders (e.g., Farrington et al. 2009b). From the viewpoint of criminal justice policy, it is important to know whether a young offender is about to stop offending or whether he or she will continue into a long criminal career.

Krohn et al. (2013) reviewed knowledge about adult onset offenders. Their offending is often different from that of earlier onset offenders; in the Cambridge Study, late onset offenders tended to commit sex crimes, theft from work, vandalism, and fraud, whereas juvenile onset offenders were most likely to commit burglary and vehicle theft (McGee and Farrington 2010). In the same project, Zara and Farrington (2009) found that the best predictors of late onset offenders were high nervousness and few friends, which may perhaps have protected boys from offending in adolescence.

There has also been a great deal of interest in intergenerational transmission, and several longitudinal studies have followed up the children of the original participants. (Special sections of journals on this topic have been edited by Capaldi et al. 2003 and by Bijleveld and Farrington 2009.) Many researchers have been interested in mediating factors that might intervene between parental offending and child offending. For example, in the Rochester Youth Development Study, Thornberry et al. (2009) found that the continuity from parental self-reported delinquency to child antisocial behavior was primarily mediated by parent stress and ineffective parenting. Similarly, in the Cambridge Study, the intergenerational transmission of convictions decreased in strength after controlling for intervening family and socioeconomic risk factors (Farrington et al. 2009a).

In recent years, there has been a great deal of research on continuity and change in offending. Researchers now realize that relative stability is perfectly compatible with absolute change (Farrington 1990). Nagin and Paternoster (1991, 2000) proposed that the continuity between juvenile and adult offending may reflect either persistent or population heterogeneity (the persistence of an underlying construct such as an antisocial personality or low self-control) or state dependence (the fact that the occurrence of an early crime increases the probability of a later crime, for example because of labeling or stigmatization) or both. In the Cambridge Study, persistent heterogeneity was more important (Paternoster et al. 2001). The same was true in the Dunedin study, but additionally, Piquero et al. (2005) found that continuity was similar for males and females. In a related research, Gordon et al. (2004) found that boys who joined a gang were worse beforehand but that they became even more delinquent after joining a gang.

The language of risk and protective factors has taken over criminology (Farrington 2000; Hawkins and Catalano 1992). The key risk factors for offending that were identified in early longitudinal surveys have generally been confirmed in later surveys: high impulsiveness or low self-control, low intelligence, low school attainment, poor child-rearing, poor parental supervision, young mothers, child abuse, parental conflict, disrupted families, low socioeconomic status, delinquent peers, and bad neighborhoods (Derzon 2009; Farrington et al. 2012; Jolliffe and Farrington 2009; Leschied et al. 2008). However, there have been some new developments. For example, researchers have tested alternative hypotheses about intervening mechanisms between risk factors and offending (e.g., Juby and Farrington 2002). In the British Cohort Study, Murray et al. (2010) investigated the extent to which very early risk factors (measured up to age 5) predicted self-reported convictions at ages 30 and 34. Most of the early longitudinal studies did not start until age 6 or later. Murray and his colleagues found that the strongest early predictors were a single mother, a teenage mother, maternal smoking during pregnancy, loss of a biological parent, and family deprivation (low social class, low parental education, poverty, and household overcrowding). The likelihood of a conviction increased with the early risk score, from 17 to 44 % for boys and from 3 to 11 % for girls.

Surprisingly, there have been relatively few attempts in longitudinal studies to carry out within-individual analyses to study the effects of risk factors or life events on the course of development of offending (see Farrington 1988). Some researchers have retrospectively used life-history calendars to study this. For example, Horney et al. (1995) obtained monthly data from incarcerated felons on life circumstances such as living with a wife and drinking heavily and on crimes committed, and showed that life circumstances influenced offending. In the Pittsburgh Youth Study, Farrington et al. (2002) compared within-individual and between-individual predictors of offending. They found that peer delinquency predicted a boy's delinquency only between individuals, not within individuals, suggesting that it was an indicator but not a cause of delinquency. In contrast, parental factors predicted delinquency within individuals, suggesting that they were causes.

The life event that has been investigated most in prospective longitudinal studies is getting married. In the Cambridge Study, Theobald and Farrington (2009) found that convictions decreased after a man got married. They matched married and unmarried men on their prior number of convictions and on a propensity score measuring their likelihood of getting married. In a follow-up research, Theobald and Farrington (2011) reported that getting married at older ages had little effect on offending, because the later-married men tended to be drug users and binge drinkers and because they maintained their aggressive attitudes and continued to go out with their male friends after marriage.

There have also been increased efforts to carry out cross-national comparisons of results in longitudinal studies. For example, Pulkkinen and Tremblay (1992) found similar clusters of boys in the Jyvaskyla and Montreal studies, Farrington and Wikstrom (1994) compared criminal careers in the Cambridge and Project Metropolitan studies, and Broidy et al. (2003) compared developmental trajectories in six sites in three countries. The International Youth Development Study was designed as a comparable longitudinal study in Victoria (Australia) and Washington State, USA (McMorris et al. 2007), and many of the predictors of youth violence were similar in the two places (Hemphill et al. 2009). Cross-national comparisons are important to establish to what extent results are replicated in different settings and conversely to what extent findings might be influenced by environmental and cultural differences. Farrington and Loeber (1999) compared risk factors for delinquency in London and Pittsburgh and found that they were generally similar. However, there has not yet been any

cross-national comparison of longitudinal and criminal career research in Japan with similar research in another country.

Analyzing Recidivism of Ex-inmates with the Combined Use of Ministry of Justice and Police Data

Longitudinal Analyses of Delinquency Careers at NRIPS: Advantages and Limitations

The National Research Institute of Police Science (NRIPS) is a research institute attached to the National Police Agency of Japan. It has a considerably long history of longitudinal analyses of juvenile delinquency careers, which goes back to the 1960s and 1970s, when Mugishima and Matsumoto analyzed delinquency careers of the 1942 and 1950 birth cohorts of Japanese juveniles (Mugishima and Matsumoto 1967a, b, 1968, 1969, 1970, 1973).

Their pioneering work was succeeded by a number of younger researchers of the NRIPS, including Yutaka Harada, who has carried out a series of longitudinal analyses of delinquency careers of the 1970 and 1978 birth cohorts (Harada 1994, 2000; Harada and Yonezato 1997). These draw on the criminal career paradigm of Blumstein et al. (1986) as the analytical framework and use survival analysis and related statistical techniques. In recent years, a third generation of delinquency career researchers have worked on newer birth cohorts (Okabe and Harada 2006; Okabe 2007)

Such an accumulation of birth cohort studies makes it possible to examine similarities and differences in the delinquency careers of these birth cohorts over time. For example, Okabe and Harada (2006) compared age-crime curves of the 1970, 1978, and 1986 birth cohorts and found that peak age of offending has shifted toward a higher age by 1 or 2 years and that the drop in the offending rate in the high-teen period has become less steep in newer birth cohorts (Okabe and Harada 2006, p. 122, Fig. 2).

In spite of these and other advantages, longitudinal studies of delinquency careers at the NRIPS have suffered from two serious limitations. One is the truncation of data at the age of 20, which is the age of adulthood defined by Japanese Juvenile Law. Officially recorded "juvenile" delinquency data are discontinued once an individual becomes age 20. After that time, his or her offenses are recorded in *adult* criminal record files. The juvenile and adult criminal record files are maintained separately, and combining juvenile and adult offense records on an individual basis is prohibited, even for research purposes. This regulation makes it practically impossible to study lifelong criminal careers and is particularly unfortunate for such important research areas as the continuity and change from juvenile delinquency to adult crime (see, e.g., Loeber and Farrington 2012).

The other limitation in the NRIPS studies is that these studies are solely based on *police* records, because the NRIPS is a research institute attached to *the National Police Agency*, which is a different governmental organization from the Ministry of Justice. As a result, such pieces of information as the time period that a subject is incarcerated and the kinds of correctional treatment he or she received while in custody are not available in the dataset on the NRIPS delinquency career studies. This is a reason, at least in part, why NRIPS analyses have tended to focus on relatively early stages of delinquency careers, such as prevalence rates and the recidivism of first-time offenders. As a juvenile gets more "advanced" in his or her delinquency career, correlates related to juvenile justice institutions become much more influential than is the case in "beginners."

Recently, however, we had an opportunity that might be one small step toward breaking through the latter limitation, which is a study of recidivism of ex-inmates for violent sexual offenses against young children. This study takes the opportunity of a newly established interministry collaboration in which the Ministry of Justice provides the data on former violent sexual offenders against young children released from prisons to the National Police Agency to assist with the preventive efforts by the police.

Background of the Study

The interministry collaboration between the Ministry of Justice and the National Police Agency with regard to the information on former violent sexual offenders against young children released from prisons was put into operation in June 2005. When 5 years had passed by the end of May 2010, the Community Safety Planning Division of the National Police Agency and the Department of Criminology and Behavioral Sciences of the National Research Institute of Police Science made a collaborative effort to examine the recidivism of these former offenders during this 5-year period. This study is a part of this collaborative work and looks into the rates of rearrest and the correlates of rearrest, using survival analysis models.

Data and Methods

The data provided by the Ministry of Justice consisted of 740 former violent sexual offenders against young children[1] released from prisons during a 5-year period between June 1, 2005 and May 31, 2010. Among these 740 ex-inmates, two females were excluded because female sexual offenders might be too widely different from male sexual offenders so that they would turn out to be disturbing outliers in our analyses. Another five subjects were also excluded from the analyses, because they were practically incapable of committing further offenses.[2] Thus, the following analyses are based on the remaining 733 ex-inmates.

The official records of sexual offenses[3] for these 733 ex-inmates after release were searched in the offense history files managed by the National Police Agency. Although more than one offense was found for a few subjects, only the first offense was considered in the analyses that follow. The number of days from the day of release to the day of rearrest[4] was treated as the "time of survival." The individuals who did not commit any sexual offenses by May 31, 2010 were treated as censored cases. Note that the length of observation period differs from individual to individual, because each individual was released from prison at a different point in time during the 5-year period from June 1, 2005 to May 31, 2010, whereas the end point of the observation period was the same for everyone, that is May 31, 2010.

Out of the 733 subjects, 18 turned out to have died without committing any sexual offenses after release. For these cases, the date of death was treated as the time of censoring. Another 66 were arrested for offenses other than sexual offenses and kept under detention. Two had their

[1] "Violent sexual offenses" include indecency through compulsion, forcible rape, rape in the course of robbery, and sexually motivated kidnapping. "Violent sexual offenses against young children" means the above-listed offenses in which the victims were under 13 years of age.

[2] For example, those who were hospitalized right after being released from prison and stayed in hospital until they died.

[3] "Sexual offenses" include both "violent sexual offenses" and nonviolent offenses that are sexually motivated, such as indecency in public, violation of the "Law for Punishing Acts Related to Child Prostitution and Child Pornography, and for Protecting Children," and sexually motivated burglary/larceny, etc.

[4] Note that it is the day of arrest, NOT the day of offense.

parole revoked for breach of conditions. These 86 cases were treated as having been censored due to competing risk events.

The rates of rearrest were estimated with the Kaplan-Meier method, so that the differences in the length of observation time can be taken into account. Both overall rates of rearrest and attribute-specific rates of rearrest were estimated, in order to examine differences in the patterns of rearrest by attributes of subjects, such as the age at release and whether one was released on parole or served full-time. The correlates of rearrest were examined using Cox proportional hazards models. Both time-constant and time-varying correlates were taken into account, although only four independent variables were included in the current analyses, mainly because of the limited number of potential correlates provided by the Ministry of Justice.

Table 2 shows the variables included in the Cox proportional hazards models, together with brief descriptions on their definitions and measurements. Note that the last independent variable, namely TDCONPAL, was treated as a time-dependent explanatory variable. The analyses that follow were conducted using the SAS software package (version 9.2). The PROC LIFETEST procedure was used for the Kaplan-Meier analysis, whereas the PROC PHREG procedure was used for the Cox proportional hazards analysis.

Results

Rates of Rearrest

The subjects' overall rates of rearrest estimated with Kaplan-Meier method are shown in Fig. 1. The horizontal axis in Fig. 1 represents the time after release, measured in years. The vertical axis represents the cumulative proportion of those rearrested for sexual offenses, estimated with the Kaplan-Meier method. Therefore, the graph indicates the estimated cumulative proportion of subjects who were rearrested for sexual offenses by 1, 2, 3, 4, and 5 years after release. The height of the rightmost end of the graph indicates that the overall rate of rearrest for sexual offenses among the subjects during the 5-year period after release is estimated to be 24.4 %.

Table 2 A list of variables in the Cox proportional hazards model

Dependent variable	
DUR	The length of time after release until either rearrest or censoring, measured in days
Independent variables	
AGEATREL	Age at release, measured in years
DAYSSRVD	The length of time served in prison, measured in days
DMYPRLD	A dummy variable that represent the time-independent difference between those released on parole and those served full term:
	Coded 1 if the subject was released on parole
	Coded 0 if the subject was released after serving full term
TDCONPAL	A time-dependent dummy variable that represent whether a subject is still under parole supervision or not:
	Takes the value of 1 if still under parole supervision
	Takes the value of 0 after the parole period is over

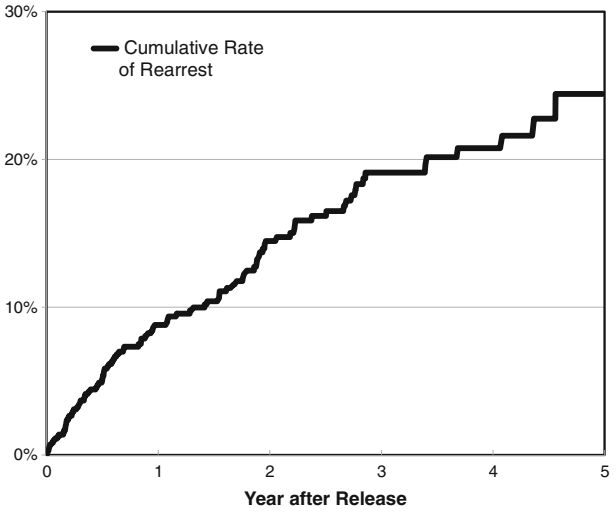


Fig. 1 A Kaplan-Meier estimate of cumulative rates of rearrest during a 5-year period after release

The convex shape of the graph indicates that those who committed a sexual offense during the 5-year observation period tended to commit it relatively early after release. The cumulative rate of rearrest for sexual offenses by 1 year after release is estimated to be 8.8 %, which suggests that more than one third of those who reoffended committed their offense within a year after release.

Figure 2 shows the Kaplan-Meier estimates of cumulative rates of rearrest of the subjects during the 5-year period after release, calculated for those full-served and for those released on paroled separately. The rightmost ends of the two graphs indicate that the estimated 5-year rearrest rate for those full-served is 29.0 %, whereas the estimated 5-year rearrest rate for those released on parole is 18.4 %.

It should be noted that the difference in cumulative rearrest rates between those full-served and those released on parole tends to be greater during the early period after release. The estimated cumulative rearrest rate by 1 year after release is 11.9 % for those full-served,

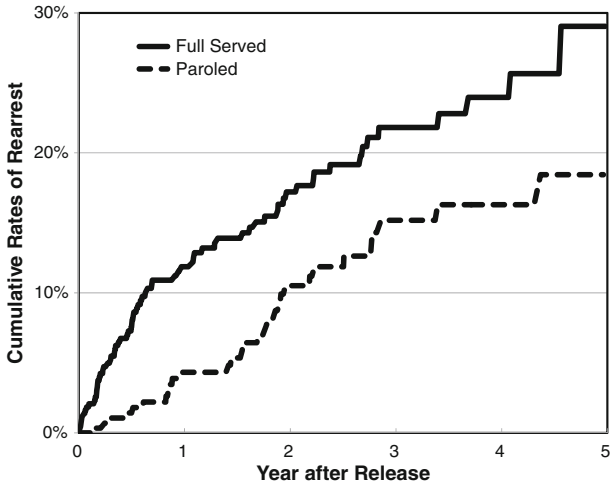


Fig. 2 Kaplan-Meier estimates of cumulative rates of rearrest during a 5-year period after release (those full-served and those paroled plotted separately)

whereas the corresponding rate is 4.3 % for those released on parole. Such a greater difference in the early period after release may be due, at least in part, to the fact that those released on parole are placed under parole supervision until the original term of the sentence expires,[5] whereas neither such supervision nor other forms of preventive/supportive intervention are given to those released after serving full term.

Correlates of Rearrest

The result of the regression analysis with Cox proportional hazards model is shown in Tables 3 and 4. Overall, our four independent variable model provides a better fit to the data compared with the model with no independent variable, and the improvement is statistically significant at the $p<0.01$ level. Therefore, the four independent variables, as a whole, can be seen as having a statistically significant impact on the hazard of rearrests for sexual offenses.

As to the impact of each independent variable, age at release (AGEATREL) has a statistically significant (at $p<0.01$ level) negative effect on the hazard of rearrest. The hazard ratio, shown in the rightmost column of the table, indicates that the hazard of rearrest declines by approximately 3.6 %[6] for the additional 1 year of age at release. On the other hand, the length of term served in prison (DAYSSRVD) appears to have no impact on the hazard of rearrest, since the hazard ratio for this variable is estimated to be 1.000 and its parameter estimate is far from being statistically significant.

The third independent variable (DMYPRLD) is a dummy variable that represents the time-independent (in other words, long-lasting) difference between those released on parole and those who served full term. This dummy variable was coded 1 for those released on parole and coded 0 for those who served full term. As the parameter estimate indicates, it has a negative effect on the hazard of rearrest, which is statistically significant at the $p<0.01$ level. The hazard ratio on the rightmost column indicates that those released on parole are less likely to be arrested for sexual offenses after release than those released after serving full term, by approximately 47.7 % ($(0.523-1)\times 100=-47.7$). In other words, the hazard of rearrest for those who served full term appears to be nearly twice as great ($1/0.523=1.91$) as the hazard of rearrest for those released on parole.

The fourth independent variable (TDCONPAL) is a time-dependent dummy variable that takes the value of 1 when the subject is still under parole supervision and takes the value of 0 after the parole supervision period is over. Note that this variable takes the value of 0 all the time for the full-served. The parameter estimates for this variable (−1.05227) suggest that this variable has a large negative impact on the hazard of rearrest (during the period under parole supervision only). However, its p value ($p=0.1028$) indicates that there *is* a possibility that the estimated negative impact of this variable may be simply a chance effect. Nevertheless, the large negative value of the parameter estimate suggests that the weak statistical power of this variable may be due mainly to the fact that only a very small number of parolees reoffended before their parole supervision period was over.[7] The hazard ratio in the rightmost column suggest that those released on parole are less likely to be arrested for sexual offenses *while they are under parole supervision*, by approximately 65.1 % ($(0.349-1)\times 100=-65.1$), *than after*

[5] The median length of parole supervision period among the parolees ($N=296$) was 97 days (i.e., approximately 3 months) and the 90 percentile was 189 days (i.e., approximately 6 months). The longest period of parole supervision was 352 days.

[6] $(0.964-1)$x $100=-3.6$.

[7] There were only three such cases among the 733 subjects.

Table 3 Results of Cox proportional hazard regression

Test of H0: Beta=0			
Test	χ^2	*DF*	Pr>χ^2
Likelihood ratio	33.578	4	<0.0001
Score	31.002	4	<0.0001
Wald	29.223	4	<0.0001

the parole supervision is over. In other words, the hazard of rearrest after the parole supervision is over (or for those full-served) appears to be nearly three times greater (1/0.349=2.87) than the hazard of rearrest during the period under parole supervision.

Discussion

The results illustrated above suggest strongly that former violent sexual offenders against young children released after serving the full term may have a greater risk of committing sexual offenses again after release, than those released on parole. What is particularly notable is that, during the early period after release, the time-independent difference between those paroled and those full-served (DMYPRLD) and the time-dependent effect of parole supervision (TDCONPAL) may work in a multiplicative manner. If that is the case, the relative risk of rearrest for those full-served may appear to be approximately five times greater than for those released on parole (and are still under parole supervision).

These findings imply that some kind of preventive intervention is urgently needed to cope with the high risk of former violent sexual offenders released from prisons after serving the full term. The National Police Agency has taken action in response to these findings. The Agency revised the operational guidelines for the prevention of recidivism of those notified by the Ministry of Justice. Starting on April 1, 2011, the police are visiting the individuals' place of residence, asking them to have face-to-face contact with the officers in charge,[8] in order to make sure that they have not become missing. Although it is not clear whether such a modification of operation will bring about a major improvement in preventing the subjects' recidivism, it appears to be a step forward toward designing better policies for preventing the recurrence of sexual offenses by the ex-inmates, based on scientific evidence.

This study is admittedly preliminary. An obvious limitation is that the independent variables used in the Cox model are far from comprehensive. A number of potentially important correlates of recidivism are not included in the current model, partially because of the limitations of the data provided by the Ministry of Justice. For example, such pieces of information as the treatments given to the subjects while they were institutionalized and the risk assessment conducted in the course of treatment are currently not provided in a systematic manner. Negotiations are continuing between the Ministry of Justice and the National Police Agency, because these pieces of information are essential not only for more relevant analyses but also for more effective practices of front-line officers, focused on the subjects with the greatest risks.

[8] Until then, officers were not allowed to have direct contact with the subjects and therefore officers had to make observations of the subjects from a distance.

Table 4 Analysis of maximum likelihood estimates

Variable	*DF*	Parameter estimates	Standard error	Wald χ^2	Pr>χ^2	Hazard ratio
AGEATREL	1	−0.037	0.008	18.758	<0.0001	0.964
DAYSSRVD	1	0.000	0.000	0.021	0.886	1.000
DMYPRLD	1	−0.648	0.237	7.479	0.006	0.523
TDCONPAL[a]	1	−1.052	0.645	2.662	0.103	0.349

[a] Time-dependent explanatory variable: still on parole supervision=1, after parole supervision is over=0

Conclusion

Even though there are still numerous limitations and shortcomings, this study is practically *the first* analysis of recidivism in Japan, in which data from the Ministry of Justice and from the National Police Agency were matched with each other on an individual basis. We sincerely hope that this study will trigger serious efforts for rethinking and redesigning the measures for preventing Japanese women and young children from being victimized by recurrent offenders.

Criminal Career Research by the Ministry of Justice

Criminal Career Research in the Research and Training Institute, Ministry of Justice

The Research Division of the Research and Training Institute (RTI) is the research body of the Ministry of Justice and is responsible for compiling the annual White Paper on Crime which contains basic statistical information on crime and the operation of criminal justice and thematic research (Crime 2007). In 2007, the RTI published the White Paper on Crime discussing the patterns of recidivism based on a large database of one million offenders extracted from the computerized archive of past criminal records (Crime 2007). It subsequently published a rather extensive research report based on these findings (Someda et al. 2009). These analyses were among the most influential theoretical foundations of the current criminal justice policy to tackle recidivism in Japan.

Data

The computerized criminal record database contains all records of convictions that were finalized in Japan since 1948. The RTI was allowed to randomly sample the records of one million offenders, whose conviction was finalized between 1948 and September 30, 2006. Convictions of a minor nature, e.g., offenses of criminal negligence, dangerous driving causing death or injury, and traffic-related violations, were excluded. Another dataset was created from this data, where the offender was (1) born after January 1, 1930; (2) more than 20 years old at the time of trial; and (3) not confirmed dead as of September 30, 2006. The first dataset contains a total of 1,680,495 convictions and is called the "one million offender data." The second dataset contains 1,218,843 convictions of 712,898 offenders and is called the "700,000 offender data."

In these data, when an offender was convicted for multiple offenses, such as theft (Penal Code offense) and Stimulant Control Act (special act offense), this is counted as one Penal Code offense. When an offender was convicted of more than one Penal Code offense, such as theft and burglary, the offense that appears earlier in the Penal Code was recorded for further analysis.

Since the data make it possible to measure the time between first, second, and subsequent convictions, recidivism can be measured to reflect the actual period of possible reoffending. It is measured from the date when actual reoffending is possible; for an offender whose conviction was either a fine or a suspended sentence, the time starts on the date when the judgment became final; and for an offender who was sent to prison, it starts from the day of release from the prison.

Findings

The "one million offender data" and the "700,000 offender data" contain a mixture of convictions committed by first-time offenders and repeat offenders. Since there is not enough space here to discuss all of the findings, the distribution of convictions, the age-crime curve, and the period between the first and second convictions are discussed here.

The Distribution of Convictions over Offenders

Table 5 shows the distribution of all 1,680,495 convictions by types of offenders. Offenders who were convicted only once during the studied period consist of 71 % of all offenders. However, they only accounted for 42 % of the total convictions. In contrast, offenders who were convicted more than once were 29 % of all offenders but accounted for 58 % of all convictions.

Further, it was found that the more recorded convictions an offender has, the more he/she contributes to the increase in the number of offenses. Those offenders with 10 or more recorded convictions, in particular, who only number 8398 or 0.8 % of the entire one million offenders, were actually responsible for 108,201 (6.4 %) of all the recorded convictions. This suggests that a lot of the crimes were committed by a few offenders. The same trend has been confirmed in various evidence-based research carried out in other countries (Dawson and Cuppleditch 2007; Farrington and West 1993; Garside 2004; MacLeod et al. 2012).

Table 5 Percent distribution of offenders and convictions by number of convictions

Number of convictions	Distribution of offenders (n=1,000,000) (%)	Distribution of convictions (n=1,680,495) (%)
1	71.1	42.3
2	14.9	17.7
3	5.9	10.4
4	2.9	7.0
5	1.7	5.2
6 to 9	2.6	10.9
10 or more	0.8	6.4

Source: The Research and Training Institute, Ministry of Justice

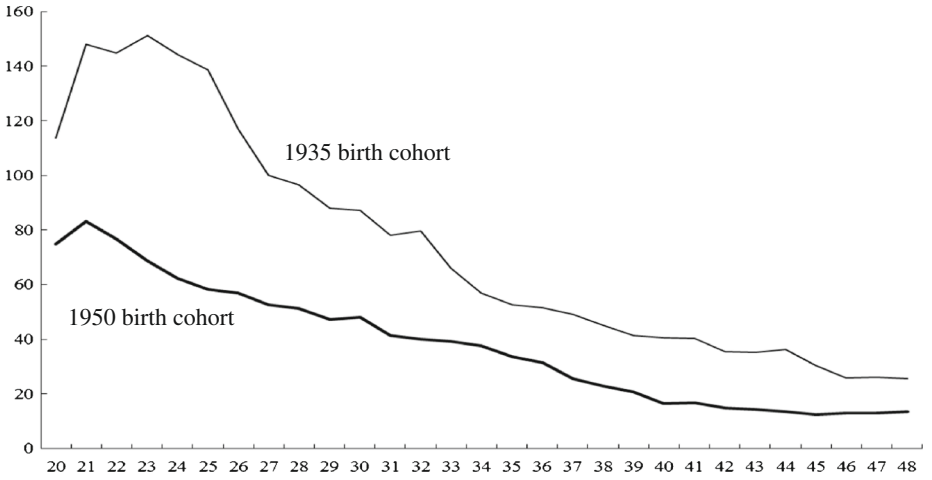
The Age-Crime Curve

The "700,000 offender data" was based upon convictions of offenders who were born after 1930 and still alive at the time of data extraction. It allowed us to compare the crime patterns of various birth cohorts without encountering problems of attrition by death, which is considered one of the crucial problems in criminal career research (Sampson and Laub 2003). Figure 3 shows age-crime curves by offender age for birth cohorts born in 1935 and 1950, based on their ages from 20 to 48 years old. In this figure, the vertical axis is not a simple count of convictions but a crime rate that is calculated by dividing the number of offenders in this sample by 100,000 general inhabitants of the same age. The overall crime rate of the 1935 birth cohort was higher than that of the 1950 birth cohort at all ages.

For the 1935 cohort, the crime rate peaked when they were 23, corresponding to 1958, and the rate remained relatively high until when they became 25, in 1960. Then the rate sharply declined. The curve again showed a small increase when they became 32, in 1967, and showed again a sharp decrease until they were 35. This pattern might be attributed to rather unique social circumstances in Japan. The period from 1958 to 1960 was a relatively difficult period after the end of World War II in 1945, and the whole Japanese society was suffering from a high crime rate.

The 1950 cohort were only about 10 years old during 1958–1960, and so they did not reach the age of criminal responsibility, which is 14. They showed a relatively constant decrease after their crime rate peaked at 21 years old, in 1971. Their crime rate was consistently low compared to that of the 1935 cohort.

Therefore, as Moffitt (1993) indicated, different social events or backgrounds, such as the social unrest for the 1935 birth cohort and the start of economic growth for the 1950 birth cohorts in our data, affect respective crime rates. However, the most salient pattern is that the



Note: "Crime rate" refers to the number of offenders in the sample per 100,000 general inhabitants of the same age.

Source: The Research and Training Institute, Ministry of Justice, and the Statistics Bureau, Ministry of Internal Affairs and Communications

Fig. 3 Age-crime curves by two birth cohorts, 1935 and 1950

age-crime curves of both cohorts showed an overall downward trend with increasing age after the peak in their 20's. Analyses have been carried out for other birth cohorts (not shown in this figure), and the overall trend was consistent. In all cohorts, the crime rates peak in the early 20's and then sharply decline through the late 20's to the 30's and the rates continue to show milder, but steady, decreases as age increases. This again is consistent with previous research findings in other countries (Farrington 1990; Sampson and Laub 2003; Kazemian et al. 2007).

Time Interval to the Next Conviction

As the 700,000 offender data contains extensive information on reoffending dates, it allows us to calculate the time between the first and second convictions. Among the offenders in this data, 28.9 % had two or more convictions, whereas 71.1 % had only one conviction. Table 6 shows the percent distribution of the duration between first and second conviction by age group for offenders who have two or more convictions. Young offenders from 20 to 24 years old consist of more than half (56.3 %) of the total (116,145 persons out of 206,242 persons).

However, the percentage of persons who were convicted of a new offense in less than 2 years increases with increasing age except for the youngest offenders. Thirty-two percent of offenders who were convicted when they were 25–29 years old were convicted of the second offense within 2 years after they were free from those criminal sanctions (after being fined, or released from prison). However, the same rate exceeded 50 % for the offenders who were first convicted at 55–59 years old (58.2 %). For offenders who were first convicted at 65 years old or older, astonishingly 75.5 % of them were convicted again within 2 years. This suggests the difficulties of social reintegration for offenders who start their criminal careers at later stage of their lives in Japan.

All of these findings suggest that the criminal justice system should direct its attention to repeat offenders, who account for a large number of convictions compared to offenders who are convicted only once. At the same time, we need to take into account the fact that crime is committed disproportionately by young offenders but the prevalence rate declines considerably with age. However, special attention should be directed toward offenders who commit crime at a late stage of their life.

Table 6 Percent distribution of time from first conviction to second conviction by age group at the time of the first conviction

Age group	6 months or less (%)	1 year or less (%)	2 years or less (%)	5 years or less (%)	Over 5 years (%)
20 to 24 (n=116,145)	15.4	14.2	17.5	23.7	29.1
25 to 29 (n=43,331)	11.6	10.8	15.5	24.7	37.4
30 to 34 (n=22,383)	11.0	10.5	15.2	25.1	38.3
35 to 39 (n=12,048)	11.3	10.5	15.3	25.4	37.5
40 to 44 (n=6281)	11.9	10.9	15.3	27.3	34.6
45 to 49 (n=3280)	12.4	11.4	16.8	27.8	31.6
50 to 54 (n=1666)	14.6	14.2	18.8	28.8	23.6
55 to 59 (n=667)	18.6	16.8	22.8	26.1	15.7
60 to 64 (n=290)	20.3	19.0	24.5	23.8	12.4
65 or older (n=151)	15.9	31.1	28.5	18.5	6.0

Source: The Research and Training Institute, Ministry of Justice

Political Development

A dramatic crime increase was recorded in Japan, since the police recorded crime was 2,465,503 cases in 1996 and increased to 3,693,928 in 2002, and the prison population was 49,414 in 1996 and it increased to 81,225 in 2006 (Crime 2013). This led to the establishment of the Ministerial Meeting in 2003 to tackle the crime problem and to create a society that is resilient to crime.

It first discussed mainly crime prevention and the methods to subdue criminals. But in 2009, the results of the abovementioned research were reported to the Meeting and it has started to discuss the importance of recidivism prevention since then. The amendment of the Act on Penal Detention Facilities and Treatment of Inmates and Detainees in 2007 that officially introduced the specialized treatment programs, such as sex offender programs and drug programs (Shinkai 2010), and the amendment of the Offender Rehabilitation Act (2007), also facilitated the trend.

In July 2012, the Meeting adopted the "Comprehensive measures for recidivism prevention." This underlines four basic principles for recidivism prevention as follows: (a) to select and focus on effective measures based on informed knowledge about recidivism, (b) to understand pathways that lead to recidivism, (c) to be considerate toward the restoration of damage caused by crime and toward the safety of crime victims, and (d) to continue mid- to long-range measures that are supported by the general public.

The comprehensive measures also identify the primary focal areas for recidivism prevention. They are as follows: to strengthen the guidance and assistance suited to the situation of clients, to create working/living places in society for ex-offenders, and to create measures that are supported by the public through further participation from the civil society. Among these focal areas, the study and analysis of the current state of knowledge on recidivism was also included. This emphasized the importance of studying offenders, including offenders who desist from offending, and the study of factors contributing to desistance.

New Research Initiatives of the Research and Training Institute

Backed up by these governmental measures, the Research Division of the RTI is now embarking on a totally new longitudinal research project. The abovementioned research that has been so far conducted by the RTI was consistent with various criminal career research conducted by other criminologists and became a basis for the current policy. However, the aggregate patterns of criminal activities do not necessarily inform us of the individual patterns of crime participation and desistance, such as what kind of factors are associated with the onset of crime, how individuals change over time, and what kind of changes contribute toward the increase in criminal activities or desistance (Farrington 2007). For this type of inquiry, research needs to focus on the study of within-individual changes over time. The research aims to understand not only the patterns of recidivism but also to identify factors influencing the offender's rehabilitation or desistance from offending.

Young offenders have been chosen as a start. The original sample was taken from ex-inmates (n=872) released from juvenile training schools (JTS), a type of correctional institution for juvenile delinquents in Japan, from January to March 2013 who agreed to participate in the study. The study aims to grasp quasi-developmental experiences of the subjects and tries to measure the effects of life events, self-cognition, and personality on their rehabilitation process. It includes questions on individual factors (intelligence, age of onset, personal traits, personality, attitudes) and environmental factors (family situation, adaptation to school, work, delinquent peers). Based on the results, it is hoped to group offenders and to see their

trajectories of behavioral patterns and identify factors that are associated with desistance or becoming a persistent offender (Mulvey et al. 2010).

The study was started as a pilot in 2012 and is intended to continue at least for 4 years. During this period, mail questionnaires and personal interviews of both a quantitative and qualitative nature will be repeated regardless of the offender's current legal status, whether they are in society or in custody. At the end of the research project, the official dossiers will be checked in order to verify the records of recidivism. The study is at the beginning stage and so far the initial mail questionnaire to survey life after JTS has been finished. The same questionnaire is also being administered to a comparison sample of the same age group. Personal interview sessions are in preparation.

This is an unprecedented longitudinal study of ex-JTS inmates in Japan, although the scale and duration is not comparable to the other existing longitudinal studies. Nevertheless, the research team hopes that the study will yield fruitful information and advance the developmental knowledge base.

Conclusion

We hope that this article shows that prospective longitudinal surveys are beginning to be conducted in Japan, to supplement the existing criminal career research. We hope that more, and more long-lasting, research of this type will be carried out and that efforts will be made to compare the development of criminal careers in Japan with the development in other countries.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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