

The Quantitative Analysis of Juvenile Delinquency in Contemporary Japan (Part 2)¹

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Chapter 4 Changes in Crime Type Associated with Repeat Delinquency— Consideration Based on Longitudinal Delinquency Record Data in Prefecture A

According to Blumstein et al. (1986), one analytical dimension in criminal career theory is seriousness, which focuses on crime type. Change in crime type associated with recidivism is a major issue in the study of criminal careers. Hence, many researchers have focused on whether there are tendencies toward specialization in a specific crime type or toward escalation to more serious crimes associated with repeated crimes.

However, the study of crime and delinquency in Japan lacks empirical reports pertaining to either of these concepts. Hence, this chapter uses longitudinal delinquency record data to examine specific aspects of change in crime type associated with repeated delinquency.

Section 1 Previous Research

First, the major concepts will be introduced.

Crime type specialization indicates conditions wherein, as crimes are repeatedly committed, they are concentrated into a certain type. The concept opposing “specialization” is “versatility.” In other words, a greater degree of versatility equals a greater variety of crime types committed by the same criminal.

On the other hand, escalation indicates conditions in which crimes committed are progressively more serious in degree as the criminal activity is repeated. Moreover, the concept opposite to seriousness is the transition to less serious crimes, a process known as “de-escalation.”

One major issue pertaining to changes in crime type is whether recidivism leads to

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specialization. According to a review article by Klein (1984), a summary of previous research undertaken before the early 1980s showed that juvenile delinquency research supporting versatility had been more dominant than research supporting specialization.

Meanwhile, it has been clarified that some crime types lead to specialization. Farrington et al. (1988) claim that crimes such as burglary, bicycle theft, and drug crimes generally lead to specialization associated with recidivism. Furthermore, with regard to the relationship between individuality and the tendency to specialize, we know that the younger a juvenile begins committing delinquent acts, the more versatile the crimes become; furthermore, versatility shows no evidence of gender bias (Mazerolle et al. 2000).

Section 2 Research Questions and Data

Based on prior research, this chapter examines the following research questions:

- (1) To what extent do specialization/escalation occur in delinquency? How does their state differ depending on crime type?
- (2) Similar to previous research conducted overseas, are there differences in the state of specialization in delinquency according to gender and age at initial arrest?

The data used is the same 1986 BC data used in the previous chapter. This data comprises juvenile records of individuals born between January and October 1986, in a certain prefecture (Prefecture A), with one of the highest rates of delinquent acts committed nationwide. They have penal code violations recorded by the day preceding the individual's 17th birthday. The actual number of individuals is 5,207, and the number of records (cumulative number of arrestees) is 7,536.

This chapter's analysis classifies crime types by the following seven penal code violations: brutal crimes, violent crimes, motorbike theft, bicycle theft (including theft of unsupervised property), shoplifting, other theft, and other.

Section 3 Research Method

Analysis Pertaining to Escalation

The concept of escalation in research question (1) is examined using crime type distributions

for each arrest (to examine whether the ratio of more serious crimes increases with repeated arrests). Brutal and violent crimes are viewed as more serious than other crime types.

As indicated by Harada (1990), an increase in the ratio of serious crime type that accompanies increased delinquency does not necessarily indicate escalation of delinquency within an individual as delinquent acts are repeated.

For example, assume that of 5,000 juveniles arrested at least once, 500 have been arrested at least three times, and the crime type distribution at the time of first arrest was 500 for violent crime (10%) and 4500 for nonviolent crime (90%). Also, assume that crime type distribution at the time of third arrest shows that 125 individuals (25%) were arrested for violent crimes, and 375 individuals (75%) were arrested for non-violent crimes. Then, it appears that the ratio of violent crime has increased, suggesting escalation. However, this becomes a completely different narrative if crime types at initial arrest of the 4500 who did not reach a third arrest were all for non-violent crime.

While this is an extreme example, the effect of a perceived increase in the ratio of serious crime types associated with further acts of delinquency by screening out juveniles with short delinquency careers (individuals who have “washed their hands” of delinquency) is known as the “potential selection effect” (Blumstein et al. 1986: volume 1, 84). To avoid this bias, I decided to control the examination of crime-type distribution using the total number of arrests within a tracking period.

Furthermore, because average values and resulting distributions for total numbers of arrests for females were minimal, analysis was conducted for males only.

Analysis Pertaining to Specialization

The methods used for measuring specialization trends are forward specialization coefficient based in transition matrix for research question (1) and diversity index (DI) for research question (2). Transition matrix, a concept proposed by Wolfgang et al. (1972), pertains to crime type transition. An overview of this concept is as follows.

First, a crime type distribution of the “k” number of occurrences and the distribution of “k+1” occurrences are portrayed in matrix form after classifying crimes based on some standards, such as name of crime, etc., in accordance with the research goal. Similar to the figure (Fig. 4-1) by Cohen (1986), the kth crime types $i \dots j$ are aligned from most (top) to least (bottom) serious. By aligning the k+1th crime types $i \dots j$ in the same order from left to right, individuals who committed crime type “i” for the kth time and k+1th time are located in cell “p_{ii}” in the matrix’s

upper left corner. Individuals who committed crime type “j” for the kth time and k+1th time are located in cell “p_{ij}” in the matrix’s lower right corner. Those located in diagonal cells linking p_{ii} and p_{jj} are individuals with no change in crime type in either kth or k+1th occurrence of their crime. Specialization of crime type between kth and k+1th occurrence is said to occur when there is a predominance of individuals located in these cells.

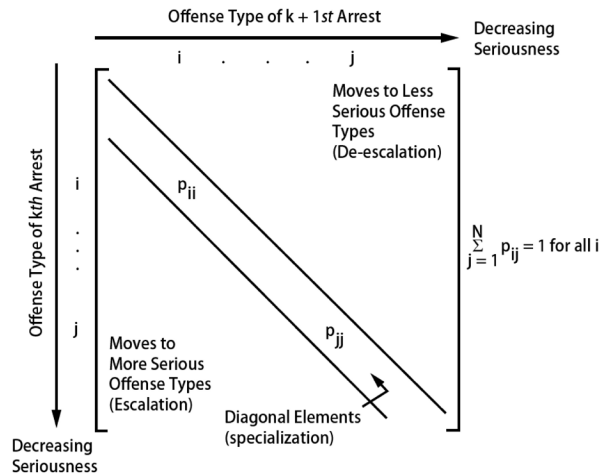


Fig. 4-1. Concept of Transition Matrix
 Note: Quoted from Fig. B-1 in Cohen (1986: 382)

On the other hand, individuals located in cells in the lower left matrix evidence escalation in the crime type committed by them. Conversely, individuals located in the upper right matrix evidence de-escalation in the crime type committed.

The suggested indicator for quantifying specialization trends based on the concept of a transition matrix is the forward specialization coefficient (FSC) (Farrington 1986; Farrington et al. 1988; Stander et al. 1989). The definition of FSC_m (forward specialization coefficient) for crime type_m is as follows:

$$FSC_m = \frac{f_m - e_m}{r_m - e_m} \quad (FSC_m \leq 1)$$

where f_m is a case frequency, kth and k+1th occurrence are the same crime type “m,” e_m is the expected case frequency that kth and k+1th occurrence will be the same crime type m assuming that the kth and k+1th occurrence are independent, and r_m is the case frequency that crime committed at kth occurrence is of type m, regardless of crime type at the k+1th occurrence. The maximum value for the forward specialization coefficient is 1, and a larger value indicates a

higher tendency toward specialization.

For example, in the transition matrix in Fig. 4-2, the forward specialization coefficient for any of the crime types is 0.95. In Fig. 4-3, the value is 0 for any of the crime types, and in Fig. 4-4, the value is 0.33 for any of the crime types.²

k^{th} occurrence ↓	$k+1^{\text{th}}$ occurrence			Total
	Crime type A	Crime type B	Crime type C	
Crime type A	870	20	10	900
Crime type B	10	870	20	900
Crime type C	20	10	870	900
Total	900	900	900	2,700
Expected frequency	300	300	300	
	300	300	300	
	300	300	300	

FSC of Crime type A-A: $(870-300)/(900-300)=0.95$
 FSC of Crime type B-B: $(870-300)/(900-300)=0.95$
 FSC of Crime type C-C: $(870-300)/(900-300)=0.95$

Fig. 4-2. Hypothetical Transition Matrix 1

Note: Created by the author, referencing Table I from Paternoster et al. (1998: 136)

k^{th} occurrence ↓	$k+1^{\text{th}}$ occurrence			Total
	Crime type A	Crime type B	Crime type C	
Crime type A	300	300	300	900
Crime type B	300	300	300	900
Crime type C	300	300	300	900
Total	900	900	900	2,700
Expected frequency	300	300	300	
	300	300	300	
	300	300	300	

FSC of Crime type A-A: $(300-300)/(900-300)=0$
 FSC of Crime type B-B: $(300-300)/(900-300)=0$
 FSC of Crime type C-C: $(300-300)/(900-300)=0$

Fig. 4-3. Hypothetical Transition Matrix 2

Note: Created by author, referencing Table I from Paternoster et al. (1998: 136)

k^{th} occurrence ↓	$k+1^{\text{th}}$ occurrence			Total
	Crime type A	Crime type B	Crime type C	
Crime type A	500	200	200	900
Crime type B	200	500	200	900
Crime type C	200	200	500	900
Total	900	900	900	2,700
Expected frequency	300	300	300	
	300	300	300	
	300	300	300	

FSC of Crime type A-A: $(500-300)/(900-300)=0.333$
 FSC of Crime type B-B: $(500-300)/(900-300)=0.333$
 FSC of Crime type C-C: $(500-300)/(900-300)=0.333$

Fig. 4-4. Hypothetical Transition Matrix 3

Note: Created by author, referencing Table I from Paternoster et al. (1998: 136)

² Piquero et al. (1999) state that this indicator should be carefully interpreted due to possible ecological fallacy.

The forward specialization coefficient focuses on changes in crime type distribution of an entire group for adjacent occurrences. In contrast, the argument that focus should be placed on crime patterns of individual criminals has become dominant in recent years (Mazerolle et al. 2000; Sullivan et al. 2006). This theory is particularly beneficial when examining differences in specialization caused by criminals' individual attributes. The diversity index (DI) is one of the representative indicators for this theory (Agresti and Agresti 1978; Reynolds 1984).

The definition of the DI_i for individual_i is as follows:

$$DI_i = 1 - \sum_{m=1}^M p_m^2 \quad (0 \leq DI_i \leq \frac{M-1}{M})$$

where M is the number of categories for crime type, P_m is the ratio of the number of occurrences of each crime type (m = 1, 2, ... M) to the total number of occurrences for each individual i. This index becomes zero when there is the maximum tendency toward specialization (when all the crimes committed by an individual are of the same type), and the value approaches $\frac{M-1}{M}$, the tendency toward specialization becomes smaller.

Assuming, for example, that for three crime type categories (crime type x, y, and z), three individuals—Subjects A, B, and C—commit the crime types from the first through fourth occurrences as shown in Table 4-1. In this case, the DI for each subject would be $1 - \{ (\frac{3}{4})^2 + (\frac{1}{4})^2 + (\frac{0}{4})^2 \} = 0.375$ for Subject A; $1 - \{ (\frac{2}{4})^2 + (\frac{2}{4})^2 + (\frac{0}{4})^2 \} = 0.5$ for Subject B; and $1 - \{ (\frac{1}{4})^2 + (\frac{2}{4})^2 + (\frac{1}{4})^2 \} = 0.625$ for Subject C.

Table 4-1 DI Example

	1 st	2 nd	3 rd	4 th	DI
	Occurrence	Occurrence	Occurrence	Occurrence	
Subject A	Crime Type x	Crime Type x	Crime Type x	Crime Type y	0.375
Subject B	Crime Type x	Crime Type x	Crime Type y	Crime Type y	0.5
Subject C	Crime Type x	Crime Type y	Crime Type y	Crime Type z	0.625

Here, we follow an example of use of DI in previous research to examine how much the degree of crime type specialization changes according to gender and age at time of first arrest.

Section 4 Results and Discussion

Analysis Pertaining to Escalation

Fig. 4-5 shows the ratios of brutal and violent crime for all individuals arrested for each occurrence, calculated by total number of arrests per individual, and based on data for males only. When the (overall) transition is viewed, without considering the total number of arrests, the result is an upward slope that seems clearly to suggest that the ratio of serious crime increases with the number of arrests. Here, whether this increase is due to the potential selection effect should be further investigated.

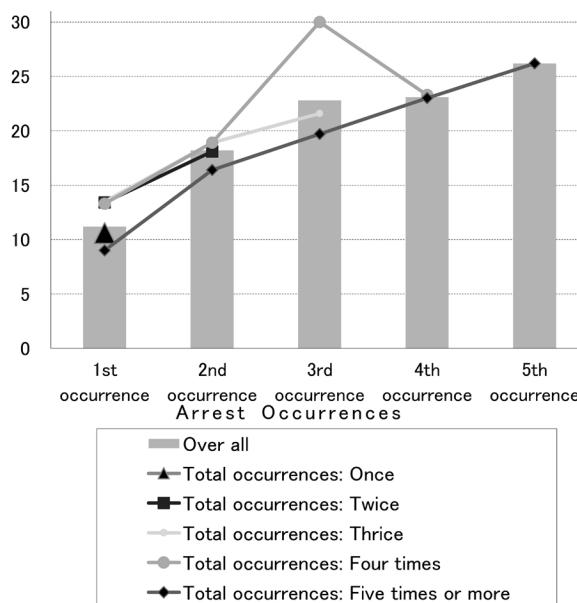


Fig. 4-5. Ratio of Brutal/Violent Crime Classified by Total Number of Arrests per Individual (Males) (Unit: %)

When the slope of the line for number of arrests per individual is chronologically compared, the graph still depicts an upward sloping line regardless of the number of occurrences represented by the total number of arrests. On the other hand, this does not indicate that the greater the total number of arrests per individual, the more upward the graph would be located.

Therefore, when viewing only the ratio of total brutal or violent crime, there appears to be a tendency to transition to more serious offenses with increasing numbers of arrests.

Analysis Pertaining to Specialization

Next, we consider aspects of crime type specialization.

Table 4-2 shows the forward specialization coefficient for each k^{th} and $k+1^{\text{th}}$ occurrence by crime type. Although a high degree of specialization in brutal crime from the third to the fourth occurrence is evident, other values are generally lower. Taking the average of the four values: $k=1$, $k=2$, $k=3$, and $k=4$, no strong trend toward specialization is found overall because the value for each crime type is below 0.3.

Table 4-2. Forward Specialization Coefficient for k^{th} and $k+1^{\text{th}}$ Occurrences by Crime Type

	k=1	k=2	k=3	k=4	Average (k=1 to k=4)
Brutal crimes	0.20	0.15	0.66	-0.07	0.24
Violent crimes	0.18	0.16	0.16	0.11	0.15
Motorbike theft	0.09	0.17	0.13	0.05	0.11
Bicycle + unsupervised theft	0.05	0.12	-0.04	0.37	0.12
Shoplifting	0.06	0.16	0.00	-0.11	0.03
Other theft	0.08	0.17	0.18	0.27	0.18
Other penal code offenses	0.07	0.09	0.04	0.19	0.09

Fig. 4-6 is the result of calculating the DI for each gender from the first occurrence to the k^{th} occurrence. Table 4-3 shows the sample size as well as Kruskal-Wallis χ^2 values and test results pertaining to the null hypothesis of no differences between the two groups. Statistically, the presence or absence of gender bias toward specialization is not consistent with k values; however, of the two genders, females seem to have a higher tendency to specialize than males.

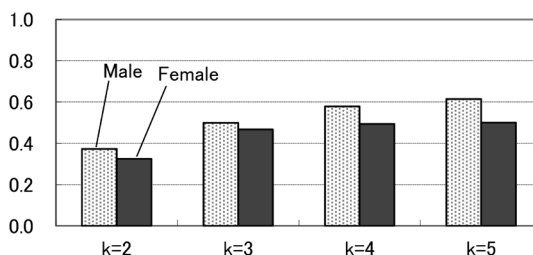


Fig. 4-6. DI up to the k^{th} Occurrence by Gender

Table 4-3. Test for Differences in DI

k	Male n	Female n	$\chi^2_{(1)}$	
2	1,046	283	10.19	**
3	434	78	1.15	n.s.
4	212	19	4.83	*
5	122	4	2.44	n.s.

** $p < 0.01$

* $p < 0.05$

Fig. 4-7 shows the result of calculating the DI from the first occurrence to the k^{th} occurrence by dividing the population into two groups, one where the age of initial arrest was 13 years or younger and another where the age of initial arrest was 14 years or older. Table 4-4 shows the sample size as well as Kruskal-Wallis χ^2 values and test results pertaining to the null hypothesis of no differences between the two groups. There was no difference in terms of trend toward specialization based on the age of initial arrest.

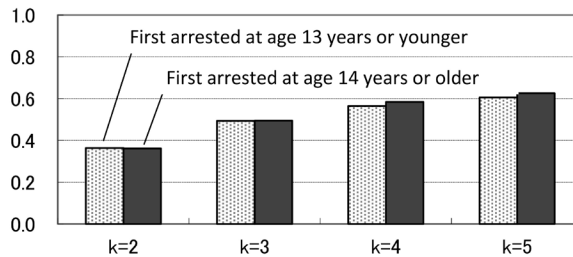


Fig. 4-7. DI up to the k^{th} Occurrence by Age When First Arrested

Table 4-4. Test for Differences in DI

k	First arrested at the age of 13 years or younger n	First arrested at the age of 14 years or older n	$\chi^2_{(1)}$	
2	557	772	0.01	n.s.
3	295	217	0.04	n.s.
4	163	68	0.17	n.s.
5	98	28	0.25	n.s.

Section 5 Summary

The results of the discussion above are summarized as follows.

First, evidence of escalation exists when brutal and violent crimes are perceived as more serious than other crimes. Second, when considering forward specialization coefficients, no strong overall trends are found toward specialization. Third, the results pertaining to DI suggest that females have a slightly greater tendency toward specialization than males, and age at initial arrest is not linked with tendency toward specialization.

Regarding the first point, the results suggest that violent delinquent acts, popularly known as “sudden type” are exceptions,³ and that the traditional development model of delinquency is still sufficiently valid in current times. This model holds that entering the world of delinquency starts with a relatively minor deviation for individuals with nurturing (home) environmental risk

³ See Okabe and Kobayashi (2005) for the validity of the concept of “sudden-type” delinquency.

factors and that the nature of delinquency deepens with accumulation of delinquent acts.

With regard to the second point, the results are consistent with major prior research conducted overseas that suggests, in general, a high degree of versatility in juvenile delinquency.

With regard to the third point, these results differ from previous research conducted in the Western countries. It is particularly noteworthy that no evidence emerged for an association between age at the time of first arrest and specialization. Possibly, there are a relatively small number of individuals in Japan who begin to participate in delinquent acts early and repeat specific crime types—“career criminals” or their underlings.

As mentioned previously, Mazerolle et al. (2000) present findings that suggest the earlier delinquency begins, the more versatile it becomes. Within this research’s background is a controversy regarding Moffitt’s (1993) proposed hypothesis that individuals who begin delinquency early are substantially different in a qualitative manner from those who do not.

This chapter’s results that are different from those of Mazerolle et al. (2000) might suggest that Moffitt’s (1993) hypothesis does not apply to Japan (at least partially)⁴.

Moffitt’s (1993) hypothesis is addressed further in the following chapters.

Chapter 5 Longitudinal Patterns of Delinquency Occurrence— Consideration Based on Longitudinal Delinquency Record Data in Prefecture A

Elucidating what crime patterns are perpetuated with the passing of time is the ultimate goal of criminal career research. In the previous chapter, analysis was provided along with the concepts of specialization and escalation. This chapter uses the two sets of BC data used in Chapter 3 to offer more detailed observations, based on previous analysis regarding patterns of change in criminal behavior associated with increasing age.

Section 1 Previous Research

Theoretical Model

Three different theoretical models pertain to change and stability of criminal behavior

⁴ There is also criticism of findings suggesting the earlier delinquency begins the lower the tendency for specialization, speculating that it is a spurious correlation due to the fact that delinquency at a lower age itself has greater versatility (Piquero et al. 1999).

associated with individuals' increasing age. A summary of these models is as follows.

According to Gottfredson and Hirschi (1990), the relative degree of individual criminality within a given group is determined through a general (single) causal process common to everyone in childhood. These researchers also claimed that criminality, while maintaining individual differences, temporarily increases for all individuals, for some reason or other, only in the adolescent stage.

In contrast, Sampson and Laub (1993), while recognizing the commonality of the causal process in determination of criminality, emphasized that criminal careers might change according to living environment. They observe that the sudden increase in individuals who discontinue criminal activity when entering adulthood can be explained by the aggregation of stabilizing life events, such as employment, marriage, and so on, that occur during this period.

In contrast, Moffitt (1993) and Patterson and Yoerger (1999, 2002) contended that there are two differing causal processes in the formulation of criminality, which lead to two different types of criminals. In one type, juvenile delinquency begins at an early age and continues criminal activity with a high frequency over a lifetime (life-course persistent type). However, in the other, delinquency begins relatively late, with participation in crime limited to the adolescent period only (adolescence-limited type).⁵

Trajectory Analysis

From the latter half of the 1990s to the present (2013), many empirical studies have been presented to verify the validity of each theory and to integrate multiple models. In recent years, analytical methods that utilize statistics and mathematics to analyze trajectories in criminal behavior changes associated with increased age, based on criminal classification models, have attracted the interest of researchers, beginning with Moffitt (1993).

Pioneering research by Nagin and Land (1993), who employed these methods, concludes, from applying the semi-parametric mixed Poisson regression model to approximately 400 males' criminal history data, that they can be classified into four groups: those with no criminal history, those limited to the adolescent period, high-level cumulative crime group, and low-level cumulative crime group. These results partially support Moffitt's (1993) classification model.

Subsequently, using the same method, many researchers have attempted analysis of criminal career trajectories. Interestingly, however, most of these studies reached conclusions

⁵ In addition to these two and based on their own empirical studies, Moffitt et al. (2002) claim the existence of a third type: that long-term crime continues at low levels.

similar to those of Nagin and Land (1993) in spite of slight differences in the number—around 3–5 derived groups, depending on the data (Nagin et al. 1995; D’Unger et al. 1998; Fergusson et al. 2000; White et al. 2001; McDermott and Nagin 2001; D’Unger et al. 2002; Chung et al. 2002). That a small number of typical patterns (trajectories) exist in the relationship between age and crime occurrence has been clarified by many studies.

Research Questions

In this chapter, the following topics are examined based on the theoretical backgrounds and trends in empirical studies mentioned above. First, I verify whether 3–5 classification groups relative to individual delinquency behavior patterns associated with increased age can be extracted, similar to previous research in North America and Europe. Once these are extracted, the trajectory formed by each group and group characteristics from the perspective of delinquent careers are examined, and longitudinal patterns of delinquency behavior in Japan are explored.

Furthermore, based on conducting the above analysis with two different sets of BC data, the question of whether delinquency career patterns have changed in recent years is discussed.

Section 2 Research Method and Data

Analytical Methods

Here also, semi-parametric mixed Poisson regression modeling is used. Many previous studies related to crime trajectories have used this model, beginning with Nagin and Land (1993). A characteristic of this model is the ability to express differences among groups through shapes of trajectories, making it a suitable method for analyzing multiple heterogeneous groups that have individual trajectories.⁶

In this model, the following two hypotheses are generally formed. In terms of crime trajectory analysis, the first is adherence of the number of crimes to Poisson distributions.⁷ The second is the ability to express the relationship between age and number of crimes in each

⁶ In addition to Nagin and Land (1993), see Nagin (2005) and Muthén (2004) for a detailed mathematical and statistical explanation of this analytical method. Moreover, Muthén (2004) viewed this method as a sub-model of growth mixture modeling.

⁷ To be specific, it is “zero-inflated Poisson” (ZIP). While probability distributions used when modeling count data are generally Poisson distributions, data on numbers of crime occurrences in most previous studies use ZIP models in place of Poisson models because the frequency occurrence of zero values is markedly higher than expected values commonly found in Poisson distributions. Our analysis also uses ZIP models. In ZIP models, two types of zero values are assumed. In terms of crime, the first always assumes a zero value, regardless of individual participation in any crime (structural zero). The other assumes a resultant zero value because crime occurrence for

trajectory in polynomial equations.

For instance, when expressing the relationship between age and number of crimes in a quadratic equation, the estimated value for the number of crimes committed by individual “i” belonging to group “k” at point in time “t” ($CRIME_{it}^k$) is expressed as follows when the age of individual i at a given point in time is “AGE_{it}” or “AGE_{it}²” when squared:

$$\log (CRIME_{it}^k) = \beta_0^k + \beta_1^k (AGE)_{it} + \beta_2^k (AGE)_{it}^2$$

The trajectory formation for each group is determined by three coefficients: β_0^k , β_1^k , and β_2^k . This model’s limitation is that all individuals in each group are assigned the same coefficient; however, different groups can possibly also have different coefficients. Presumably, then, trajectory formation will differ by group.

Hence, assuming that distribution of number of crimes for each group follows the Poisson process, using the parameter $CRIME_{it}^k$, the mathematical goal for this analysis is finding the estimated values for β_0^k , β_1^k , and β_2^k for this method by using the maximum likelihood. Proc TRAJ (Nagin 1999; Jones et al. 2001), developed for SAS, was used in the modeling.⁸ This chapter’s analysis was conducted in an environment with the modules for SAS 9.x (Version date: June 10, 2006) installed in SAS for Windows 9.1. Default initial variables were used in each modeling.

BIC (Bayesian information criterion) is used when selecting models. Here, BIC is the value obtained when the sample size is N, the maximum likelihood value is L, and the number of model parameters is p as follows:

$$BIC = \log (L) - 0.5p \log (N)$$

The greater this value the more suitable the data and the more parsimonious the model is determined to be.⁹

a given individual randomly results in zero within a specified time (random zero). While this does not mean that the individual will never commit a crime, but the frequency will be low. The ZIP model is a mixed model of two groups (zero class and non-zero class), in which the probability that an individual in the zero class will take zero (must be zero) is 1 and that an individual in the non-zero class will take zero follows a Poisson distribution. For more details, see Nagin and Land (1993) and Nagin (2005).

⁸ Proc TRAJ modules were obtained from a website by Bobby Jones. The URL is <http://www.andrew.cmu.edu/user/bjones/> (last accessed June 20, 2007).

⁹ The definition of BIC used here is the same as Schwarz information criteria (Schwarz 1978). The definition of BIC often used is -2 times the Schwarz information criteria, in other words, $-2 \log (L) + p \log (N)$. The definition used here follows Jones et al. (2001).

Moreover, if the model has the same maximum likelihood value, the larger the order of a polynomial, or the greater the number of groups, the smaller this value due to increased numbers of model parameters.

In this chapter's analysis, the relationships between the number of crimes and the age in each group is assumed to be represented by quadratic equations similar to previous important researches beginning with Nagin and Land (1993). Under those assumptions, the optimal number of groups is determined based on BIC. Specifically, sequential modeling is conducted when group number equals 1, 2, 3, etc., and the adoption model is directly before the point in time that meaningful improvements are no longer observed in BIC, once the number of groups increases beyond that number. In accordance with Jones et al. (2001), if the increased value of BIC is greater than one, then it is considered meaningful improvement.

Moreover, the ability to determine the relative size of each group by estimated values of the affiliation probability with each group, calculated based on the adoption model (posterior probability), is a useful point of this analysis method.

Data

Analysis was based on records of male data only, from that analyzed in Chapter 3. In other words, male delinquency records from Prefecture A (with a high number of delinquencies nationwide) were used. The 1978 BC data comprised 4,637 individuals and 6,791 records (number of cumulative arrests). The 1986 BC comprised 3,763 individuals and 5,708 records. While the 1978 BC included higher numbers of individuals and records, considering the difference in population of each BC (by population ratio), the numerical disparity between cohorts is actually reversed. Calculating numbers of individuals per 10,000 people, the 1978 BC had 961 individuals with 1,407 records, while the 1986 BC had 1,011 individuals with 1,533 records.

In analysis using Proc TRAJ, annual arrestee ratios for each age from 7 to 16 for each individual were calculated, and data from 10 time points were used in combination for each individual.¹⁰ In other words, the subject of analysis in this chapter is the delinquency career range from age 7 to 16.

Moreover, data used in the final analysis included individuals with no delinquency records. In other words, data analysis was conducted by finding the number of individuals with no

¹⁰ While data included very small numbers of delinquency records from ages 5–6 (each cohort had less than 5 such records), for the sake of convenience, these were treated as if they were recorded at the age 7.

delinquency records, based on the given BC population (calculated using the same method as in Chapter 3), and after creating records of zero occurrences at 10 time points for the given number of individuals, these records were combined with those of individuals with delinquency records.

Here, an overview of basic information regarding data is provided. First, the distributions for the total number of arrests for each cohort are shown in Table 5-1.

Table 5-1. Distribution of Total Number of Arrests

	1978 BC			1986 BC		
	n	Ratio in total arrestees	Ratio in the total cohort population	n	Ratio in total arrestees	Ratio in the total cohort population
1 occurrence	3,482	75.1%	7.22%	2,717	72.2%	7.30%
2 occurrences	707	15.2%	1.47%	612	16.3%	1.64%
3 occurrences	215	4.6%	0.45%	222	5.9%	0.60%
4 occurrences	103	2.2%	0.21%	90	2.4%	0.24%
5 occurrences	57	1.2%	0.12%	65	1.7%	0.17%
6 occurrences	28	0.6%	0.06%	29	0.8%	0.08%
7 occurrences	15	0.3%	0.03%	9	0.2%	0.02%
8 occurrences	14	0.3%	0.03%	10	0.3%	0.03%
9 occurrences	7	0.2%	0.01%	2	0.1%	0.01%
10 or more occurrences	9	0.2%	0.02%	7	0.2%	0.02%
Total	4,637	100.0%	9.61%	3,763	100.0%	10.11%

Of all individuals arrested, 24.9% of the 1978 BC and 27.8% of the 1986 BC were arrested twice or more, a slightly higher ratio for the 1986 BC. Moreover, the average number of arrests for each cohort was 1.5, with a maximum value of 15 arrests for the 1978 BC and 17 arrests for the 1986 BC.

Fig. 5-1 shows rearrests by cohort for youth arrested at least once. Values obtained by calculating the ratio of all individuals who experienced a first arrest to those who experienced a second arrest, and then, calculating the ratio of individuals who experienced a third arrest to all individuals who experienced a second arrest, and so on, are indicated by percentage values with the help of arrows in the figure. In both cohorts, with increase in the number of arrests, the likelihood of being arrested again also increased. For example, one of two individuals arrested three times will be arrested a fourth time.

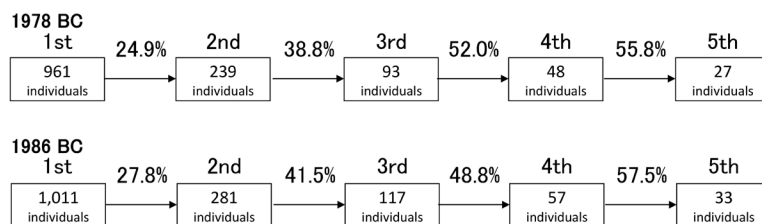


Fig. 5-1. Rearrest Conditions (per 10,000 population of each BC)

Figs. 5-2 and 5-3 show ages when a concentration of arrests occurs. Fig. 5-2 shows by cohort the value derived by summing the number of annual arrests for all individuals for each age and dividing the total value at each age by the total number of youth arrested at least once. For instance, for the value at age 14 of the 1978 BC, the total number of annual arrests at that age was 1,840. The number of individuals arrested at least once in this cohort was 4,637. Hence, the calculation is $1,840 \div 4,637 \doteq 0.40$.

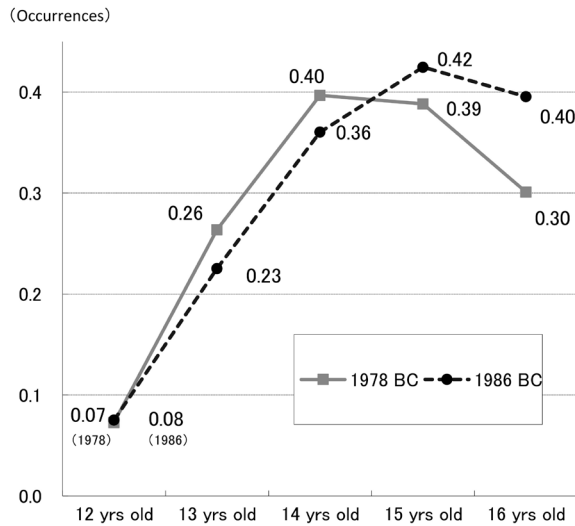


Fig. 5-2. Average Number of Arrests During a One-Year Period at Each Age for Individuals Arrested at Least Once Before the Age of 16

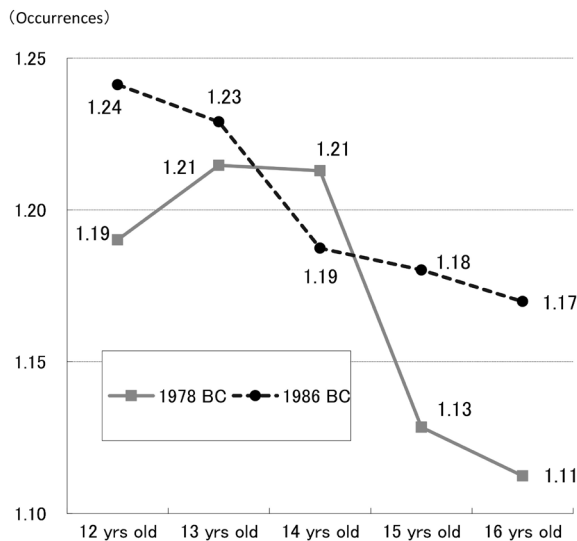


Fig. 5-3. Average Number of Arrests During the One-Year Period for Individuals Arrested at Least Once at Each Age

While obvious differences are observed between cohorts at the age 12, at ages 13–14 years, the 1978 BC value exceeds that for the 1986 BC. Conversely, at ages 15–16 years, the 1986 BC value exceeds that for the 1978 BC. Furthermore, it is noteworthy that 14 years is the peak for the 1978 BC, while the peak for the 1986 BC moves to 15 years. Moreover, the tendency to decrease from ages 15–16 is less pronounced for the 1986 BC.

Fig. 5-3 shows values by cohort derived by summing the number of annual arrests for all individuals for each age and dividing each total value by the total number of youth arrested at least once for the given age. For instance, for the 1978 BC, the total number of annual arrests at the age 14 was 1,840. The number of individuals in this cohort arrested at least once at that age was 1,517. Hence the calculation is $1,840 \div 1,517 \approx 1.21$. This value is an indicator that considers only individuals who actually participated in delinquency at each age (1,517 in this example). Even though the absolute number of participants in delinquency at a given age might be small, the value increases if that small number of participants is repeatedly arrested.

The trend of the 1978 BC showed a steep decline in occurrences at ages 15–16, compared with approximately 1.2 occurrences at ages 12–14. Interpreted along with Fig. 5-2, apparently recidivism was relatively minor at this stage even though a high number of individuals participated in delinquency at ages 15–16. In contrast, the 1986 BC peaked at the age 12, and showed a gradual decline in occurrences with increased age. The 1986 BC does not show the rapid decline characteristic of the 1978 BC.

Section 3 Results and Discussion

Model Selection

Pointwise modeling with sequential increase in group number is conducted for data from each cohort. The resultant BIC is displayed in Table 5-2.

Table 5-2. BIC Values

No. of groups	1978 BC	1986 BC
1	-30,656.04	-24,854.73
2	-29,856.37	-23,583.53
3	-28,957.88	-23,538.75
4	-29,108.09	-23,559.61

The BIC values for both cohorts increase as the number of groups increases to one, two, and three. However, when the groups number four, is compared with three, there is no increase

in the BIC value greater than 1 (conversely, a decrease for the 1986 BC). Hence, a three-group model is most suitable for both the 1978 and the 1986 BCs. Subsequent analysis for both cohorts is conducted based on this model.

Delinquency Trajectories

The relationships between age and number of arrests for each group are shown in graphs. Fig. 5-4 is the delinquency trajectory for the 1978 BC, and Fig. 5-5 is the delinquency trajectory for the 1986 BC.

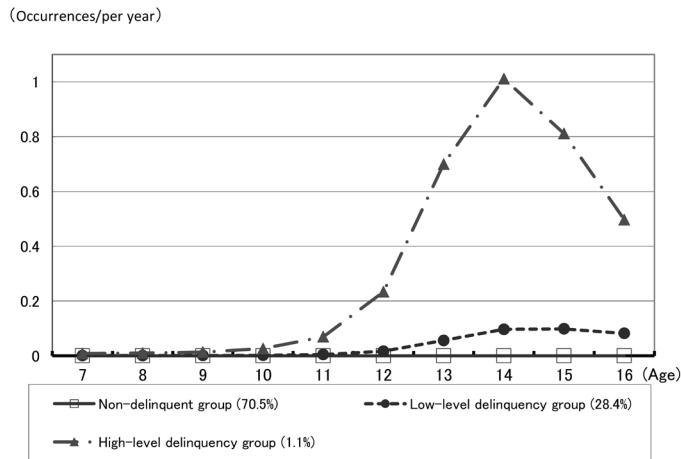


Fig. 5-4. Trajectory of the 1978 BC (Expected Value)

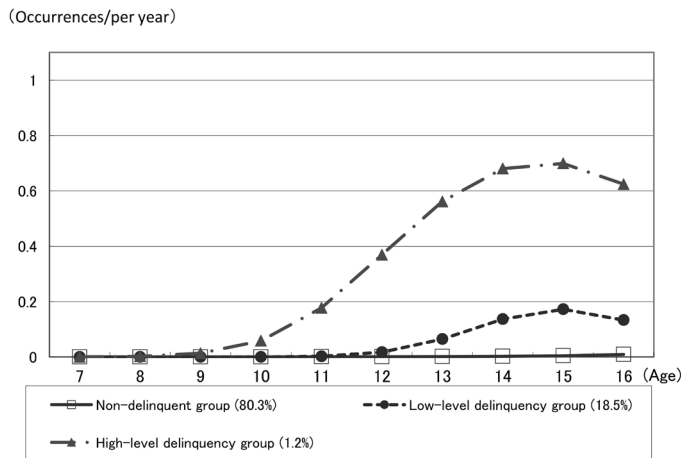


Fig. 5-5. Trajectory of the 1986 BC (Expected Value)

First, the following three typical groups can be derived from the 1978 BC trajectory: The group with no delinquency at any age; the group that started delinquency from around age 12 and peaked, albeit at low levels, at around age 14–15; and the group that began delinquency at around the age of 10 and repeated delinquency at rather high levels, peaking at age 14. As shown in the legend, these groups are referred to as “non-delinquent group,” “low-level delinquency group,” and “high-level delinquency group.”

Based on this model, the probability that a given individual is affiliated with each of the groups (posterior probability) can be estimated. The legend includes the size of each group based on these calculations, which show that the non-delinquent group is about 70% of the total population, while the high-level delinquency group is less than 1% of the total population.

Similar to the 1978 BC, the 1986 BC trajectory also suggests three groups: non-delinquent group, low-level delinquency group, and high level delinquency group. The size of each group shows that the non-delinquent group accounts for 80% of the total population, while the high-delinquency group accounts for approximately 1% of the total.

However, the peak of the high-level delinquency group shifts more to the right in the 1986 BC than in the 1978 BC. Furthermore, the formulation of the high-level delinquency group’s trajectory reveals that compared with 1978 BC, the 1986 BC demonstrates more gradual changes in increasing occurrences approaching the peak and decreasing occurrences after the peak.

By depicting trajectories for high-level delinquency groups of both cohorts, Fig. 5-6 elucidates differences between cohorts. While the 1986 BC exceeds the 1978 BC from ages 10–12; conversely, the expected value for the number of arrests in the 1978 BC is higher from ages 13–15. However, disparity in values is again reversed at the age 16, as the the number of arrests in 1986 BC exceeds that in the 1978 BC. The two cohorts depict relatively contrasting trajectories, at least with regard to high-level delinquency groups.

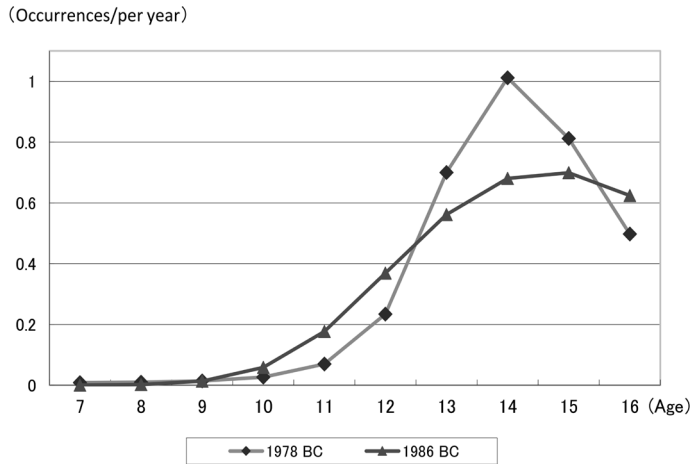


Fig. 5-6. Trajectories of the High-Level Delinquency Groups in BCs (Expected Value)

Next, fundamental data pertaining to expected values for the number of arrests is examined only for the low- and high-level delinquency group (Table 5-3). Almost no differences appear in average values for both the low- and high-level delinquency groups in both cohorts. However, examination of maximum values shows clear differences between the two cohorts. In particular, there is a difference in maximum value exceeding 0.3 (occurrences) between high-level delinquency groups in the 1978 BC and 1986 BC. The level of delinquency occurring at the peak for the high-level delinquency group is clearly higher in the 1978 BC.

Table 5-3. Basic Data Pertaining to Expected Values for Number of Arrests

	Expected value at age 7	Expected value at age 10	Expected value at age 13	Expected value at age 16	Average expected value	Maximum expected value
1978 BC						
Low-level delinquency group	0.00	0.00	0.06	0.08	0.04	0.10
High-level delinquency group	0.01	0.03	0.70	0.50	0.34	1.01
1986 BC						
Low-level delinquency group	0.00	0.00	0.06	0.13	0.05	0.17
High-level delinquency group	0.00	0.06	0.56	0.62	0.32	0.70

Characteristics of Each Group

With a focus on delinquency career aspects, Table 5-4 summarizes characteristics of each group. From the left, the table shows the sum of the total numbers of arrests for every member in the group until the age of 16, divided by the number of total group members (average value); the arrest ratio for each group’s members as a percentage of the overall cumulative number of arrestees (number with a delinquency record); the average age at initial arrest; and the ratio of

individuals arrested at least once for brutal/violent crimes as a percentage of the total members of the group.

Table 5-4. Characteristics of Each Group from the Perspective of Delinquency Career

	Average total number of arrests per individual (occurrences)	Ratio (%) of all number of arrests	Average age at initial arrest (years old)	Ratio (%) of individuals arrested for brutal/violent crimes
1978 BC				
Non-delinquent group	—	—	—	—
Low-level delinquency group	1.2	74.0	14.3	10.3
High-level delinquency group	4.4	26.0	13.0	42.3
1986 BC				
Non-delinquent group	0.0	0.9	—	0.0
Low-level delinquency group	1.3	76.6	14.6	15.1
High-level delinquency group	4.6	22.5	12.4	52.3

Note: Values were obtained by adding measured values of data for each group

The following can be deduced from this table. First, common to both cohorts is that the total number of arrests per individual is highest for the high-level delinquency group, followed by the low-level delinquency group, and then the non-delinquent group. Juveniles in the high-level delinquency group have three to four times more arrests than juveniles in the low-level delinquency group. In other words, a rather small portion of juveniles commits about 25% of all delinquent acts.

Second, average age at initial arrest for the high-level delinquency group in the 1978 BC was 13.0, while average age in the low-level delinquency group in the same cohort was 14.3. For the 1986 BC, average age at initial arrest for the high-level delinquency group was 12.4, and that in the low-level delinquency group was 14.6. It is particularly noteworthy that average age in the high-level delinquency group in the 1986 BC is lower than that in the 1978 BC. These results are consistent with previous observations regarding trajectories.

Third, the ratio of individuals arrested for brutal/violent crimes as a percentage of the entire group is higher for both the low- and the high-level delinquency groups in the 1986 BC than the ratio for the same groups in the 1978 BC. Furthermore, when comparing the low- and the high-level delinquency groups within the same cohort, the value is markedly higher in the high-level delinquency groups. Of youth in the high-level delinquency groups, 42% in the 1978 BC and 52% in the 1986 BC have been arrested for committing violent acts of delinquency.

In sum, the comparison of the two delinquency groups shows that the number of delinquent acts is markedly higher, the age at which delinquency begins is earlier, and the potential for committing violent acts of delinquency is higher for juveniles in the high compared with the low-level delinquency group.

Section 4 Summary

In this chapter, semi-parametric mixed Poisson regression modeling was used to examine longitudinal patterns in delinquency behavior based on trends in previous research in Western countries on crime trajectories, beginning with Nagin and Land (1993).

The major findings are as follows:

- (1) Three differing but typical groups were derived for both the 1978 and 1986 BCs based on patterns of relationship between age and crime. The three groups are as follows: no delinquency at any age (non-delinquent group), delinquency beginning around the age 12 and depicting a curve with relatively low levels of delinquency that peak at ages 14–15 (low-level delinquency group), and delinquency beginning at around ages 9–10 and depicting a curve with relatively high levels of delinquency at ages 14–15 (high-level delinquency group).
- (2) The groups' sizes revealed that the non-delinquent group accounted for 70–80% of the total, while the low-level delinquency group accounted for 20–30%. The high-level delinquency group accounted for approximately 1%.
- (3) A comparison of ages at peak delinquency shows that the 1978 BC peaked at around the age of 14, while the 1986 BC peaked at around the age 15.
- (4) The delinquency trajectory depicted by the high-level delinquency group was less pronounced for the 1986 BC than for the 1978 BC, and the peak value for the 1986 BC was also lower.
- (5) A comparison of delinquency groups shows that delinquency began at an earlier age, and the potential for committing violent delinquency acts was higher for the high-level delinquency group.

Additional observations addressing the following two points can be made from these findings.

First, an issue related to the identified groups has been discussed. The three groups derived from analysis in this chapter do not include the high- and low-level cumulative crime group depicted by Nagin and Land (1993). In spite of some differences in trajectory formation, previous

research often suggests existence of groups who dedicate themselves to continual crime even after adulthood. However, such groups were not found in this chapter's examination.¹¹ Possibly, these results demonstrate one characteristic of crime/delinquency occurrence patterns in Japan. Regarding this point, criminological classification frameworks by Moffitt (1993) and Patterson and Yoerger (1999, 2002) might not be able to sufficiently explain current aspects of crime/delinquency in Japan.

Second, the existence of two groups, namely, the high- and low-level delinquency groups, was suggested. Both groups depict trajectories that peak at ages 14–15. Significantly, a small minority of juvenile arrestees in high-level delinquency groups commit approximately one quarter of all delinquent acts, in spite of their rather small number.

I believe that these specific findings provide significant evidence for the practice of criminal justice. Repeated delinquency by a small minority of juveniles should be the focus of countermeasures against delinquency because reducing this group's recidivism would cause great reduction in the total volume of delinquency. This chapter's analytical results provide an empirical basis to the claim that, rather than general prevention, devising and implementing countermeasures focused on specialized prevention should be prioritized.

Chapter 6 Home Environment and Delinquency—Consideration Based on Official Statistics, Questionnaire Surveys of Youth Involved in Delinquency, and Longitudinal Delinquency Record Data

In this chapter, the relationship between home environment and juvenile delinquency is examined based on reviews of official statistics and questionnaire surveys of youth involved in delinquency.

While home and family environment is often presented as a leading relevant factor in delinquency, as mentioned in Chapter 1, the premise for “popularization of delinquency” and “average child” discourse is the perception that the relationship between home environment and delinquency is currently diminishing.

This chapter utilizes examination of official statistics and analysis based on data combining longitudinal delinquency records with questionnaire surveys of youth involved in delinquency

¹¹ Because data from their adulthood is not used in this research, affirmations cannot be made; however, because trajectories depicted from this chapter's analysis show downward trends from ages 15–16, groups that commit to continual crime from youth to adulthood could not be found.

to explore the extent of the relationship between home environment and juvenile delinquency in modern Japan.

Section 1 Research Method

Examination of Official Statistics

Analysis of official statistics uses the following methods.

First, populations according to status of both parents of those ages 12–17 were obtained from 2005 and 2010 census data. Census Reports show numbers of children belonging to family households according to co-residency status of the father and mother. Hence, the status of both parents is discerned through co-residency status. Married individuals and individuals not living in family households (children living independently, etc.) are excluded.¹²

Next, the number of arrestees for penal code violations according to status of both parents at juveniles' ages 12–17 was obtained from 2005 and 2010 Census Reports. Using data from the census and the "Crime Statistics," arrestee ratios for individuals with "both parents," "mother only," and "father only" are calculated. From these values, the relative risk of individuals in "mother only" and "father only" conditions is calculated using "both parents" as the standard. Values exceeding 1 suggest a relationship between home environment and juvenile delinquency based on the status of parents.

Consideration Based on Questionnaire Surveys and Longitudinal Delinquency Record Data

Questionnaire surveys were conducted to determine factors related to adolescents and violence: surveys targeted juveniles in their first year of middle school and beyond who had been arrested for crime types that correspond to brutal or violent crimes. The implementing organization was the National Research Institute of Police Science with the author as the chief researcher.

As a rule, the survey was conducted with juveniles arrested from August to October 2002 as participants. Implementation comprised establishing set respondent target numbers for each prefecture, based on the number of arrestees for brutal/violent crime in the past 2 years, and then selecting cases targeted for survey at the discretion of each police department's personnel.

In addition to demographic information, such as gender, etc., the survey included

¹² Quite a few individuals leave home and live independently after age 18. In this analysis, therefore, subjects are limited to those 17 and younger.

items related to abuse experienced at home as indicators of home environment. Specifically, respondents were asked the frequency with which they experienced the following eight actions: “had items thrown at you,” “were hit or kicked,” “repeatedly belittled,” “were told to ‘go to hell/die,’” “not given food to eat,” “ignored no matter what you said,” “breasts or genitals were forcibly touched,” and “forced intercourse or threat of the same.” The possible answers were “often,” “sometimes,” “not often,” and “never.”

In addition, of the questions asked by police department personnel, “whether the father is the individual’s actual father (including adoptive father) (variable name: natural or adoptive father)” was used as relevant to home environment.

Furthermore, each case was classified into three groups based on the juvenile’s record until the time of survey: “non-delinquent group,” “one-time delinquency group” and “two-or more-times delinquency group.”

After omitting surveys with incomplete responses, the participant pool comprised 728 cases (criminal records of 727 of the 728 cases were available). Distributions of these cases by gender and education/employment, age, crime type, and number of delinquency occurrences are shown in Tables 6-1 through 6-4. Table 6-3 shows combined distributions of number of arrestees by crime type in the 2002 official statistics (Crime Statistics) for the same age group. Distribution of crime type for respondents in this survey closely matches the distribution for official statistics, and absence of bias from data obtained in questionnaire surveys was confirmed regarding this point.

Table 6-1. Distributions by Gender and Educational/Work Status of Questionnaire Respondents (Unit: %)

	Male (n=613)	Female (n=115)	Total (n=728)
Middle school student	23.2	30.4	24.3
High school student	28.9	24.3	28.2
Vocational school/ university student	2.8	1.7	2.6
Employed	22.8	11.3	21.0
Not employed	22.3	32.2	23.9
Total	100.0	100.0	100.0

Table 6-2. Questionnaire Respondents' Distributions by Age (Unit: %)

Age	Ratio
12 yrs old	0.7
13 yrs old	1.9
14 yrs old	13.0
15 yrs old	19.0
16 yrs old	23.6
17 yrs old	19.2
18 yrs old	14.0
19 yrs old	8.5
Total	100.0 (n=728)

Table 6-3. Questionnaire Respondents' Distributions by Crime Type (Unit: %)

	Surveyed subjects (n=728)	2002 statistics (n=19,461)
Homicide	1.1	0.4
Robbery	9.6	8.3
Arson	0.7	0.6
Rape	1.4	1.2
Unlawful assembly with weapons	0.1	1.3
Assault	6.5	10.6
Bodily injury	47.8	50.8
Threats	1.1	0.9
Extortion	28.4	25.9
Other punishable offenses, such as violent acts, etc.	3.3	—
Total	100.0	100.0

Note: According to National Police Agency Statistics, violations of the law concerning Punishment of Physical Violence and Others (Articles 1, 1-2, and 1-3), are counted as either of violence, bodily harm, threats, or property destruction (penal code violations) depending on the manner in which the acts were committed. Of the violations concerning Punishment of Physical Violence and Other, property destruction was omitted from the table.

**Table 6-4. Distributions by Number of Delinquency Occurrences
for Questionnaire Respondents (Unit: %)**

N of Delinquency Occurrences	Ratio
None	44.3
Once	25.3
Twice	13.1
3 times	6.9
4 times	4.7
5 times	3.0
6 times	0.8
7 times	1.1
8 times	0.6
9 times or more	0.3
Total	100.0 (n=727)

Note: Included in the "5 times" grouping are two cases for which the number of occurrences was unclear, but for which "5x or more" occurrences could be confirmed.

Moreover, in the analysis of questionnaire survey data, answers were totaled after omitting non-responses.

Section 2 Results and Discussion

Examination of Official Statistics

The results of examining official statistics are shown in Tables 6-5 and 6-6.

Table 6-5. Arrestee Ratios and Relative Risk by Status of Parents (2005)

	Number of children belonging to family households (individuals)				Number of arrestees (individuals)			
	Both parents (a)	Mother only (b)	Father only (c)	Other	Both (d)	M only (e)	F only (f)	Other
Aged 12 yrs	994,326	153,583	26,985	6,935	2,307	1,201	262	35
Aged 13 yrs	1,005,001	160,802	28,642	7,297	8,010	3,754	861	136
Aged 14 yrs	997,107	164,685	30,425	7,801	14,726	6,152	1,579	194
Aged 15 yrs	1,002,290	170,300	31,826	9,276	18,140	6,829	1,709	266
Aged 16 yrs	1,014,557	176,139	34,602	10,951	20,790	6,074	1,684	273
Aged 17 yrs	1,040,758	182,583	35,848	11,891	14,217	3,994	1,144	192
	Arrestee ratio (per 1,000 individuals)				Relative risk (compared with "both parents")			
	Both parents (d)/(a)=(aa)	Mother only (e)/(b)=(bb)	Father only (f)/(c)=(cc)		M only (bb)/(aa)	F only (cc)/(aa)		
Aged 12 yrs	2.3	7.8	9.7		3.4	4.2		
Aged 13 yrs	8.0	23.3	30.1		2.9	3.8		
Aged 14 yrs	14.8	37.4	51.9		2.5	3.5		
Aged 15 yrs	18.1	40.1	53.7		2.2	3.0		
Aged 16 yrs	20.5	34.5	48.7		1.7	2.4		
Aged 17 yrs	13.7	21.9	31.9		1.6	2.3		

Note 1: Prepared by the author using "Crime Statistics" for each year and the "Census Report" from the Ministry of Internal Affairs and Communications Statistics Bureau

Note 2: Numerical values for "number of children belonging to family households" are the number of people categorized as "residing with both parents," "residing with a female parent," "residing with a male parent," and "not living with a parent or unknown whether living with a parent," respectively. Residing with parent(s) qualifies as status of parents. Moreover, married individuals and individuals not living in family households (children living independently, etc.) are not included in this table.

Note 3: Numerical values for "Number of Arrestees" are numbers of people who have "both parents"; "mother, but no father"; "father, but no mother"; and "neither parent or unknown," respectively.

Table 6-6. Arrestee Ratios and Relative Risk by Status of Parents (2010)

	Number of children belonging to family households (individuals)				Number of arrestees (individuals)			
	Both parents (a)	Mother only (b)	Father only (c)	Other	Both (d)	M only (e)	F only (f)	Other
Aged 12 yrs	977,538	177,182	28,097	6,994	1,906	1,086	197	22
Aged 13 yrs	960,570	185,043	29,978	7,103	6,471	3,763	701	90
Aged 14 yrs	944,492	189,739	32,213	7,911	11,615	5,903	1,169	151
Aged 15 yrs	945,336	198,806	35,077	9,055	12,576	5,982	1,404	204
Aged 16 yrs	932,986	204,142	36,332	10,232	12,014	5,042	1,261	186
Aged 17 yrs	906,132	203,378	37,278	10,775	7,731	3,117	803	123
	Arrestee ratio (per 1,000 individuals)				Relative risk (compared with "both parents")			
	Both parents (d)/(a)=(aa)	Mother only (e)/(b)=(bb)	Father only (f)/(c)=(cc)		M only (bb)/(aa)	F only (cc)/(aa)		
Aged 12 yrs	1.9	6.1	7.0		3.1	3.6		
Aged 13 yrs	6.7	20.3	23.4		3.0	3.5		
Aged 14 yrs	12.3	31.1	36.3		2.5	3.0		
Aged 15 yrs	13.3	30.1	40.0		2.3	3.0		
Aged 16 yrs	12.9	24.7	34.7		1.9	2.7		
Aged 17 yrs	8.5	15.3	21.5		1.8	2.5		

Note 1-3: Same as notes in Table 6-5

Calculations from 2005 official statistics show relative risks for arrest of 1.6–3.4-fold for individuals with “mother only” and that of 2.3–4.2-fold for individuals with “father only,” compared with individuals with “both parents.” Similarly, calculations from 2010 official statistics show relative risks for arrest of 1.8–3.1-fold for individuals with “mother only” and that of 2.5–3.6-fold for individuals with “father only,” compared with individuals with “both parents.” In both years and in all age groups, the risk for individuals with “father only” was higher than for those with “mother only.” Furthermore, it was clear that risk increased in lower age groups.

These results suggest that, even today, juveniles who have less favorable home environments have a higher probability of participating in crime. Furthermore, it can be interpreted that importance of home environment decreases relative to increased age.

Consideration Based on Questionnaire Surveys and Longitudinal Delinquency Record Data

Analytical results of questionnaire surveys are as follows.

Table 6-7 is a cross tabulation showing the number of individuals who have either a natural or adoptive father, by crime type (hereinafter referred to as the “natural father ratio”). Results of chi-square test show significant differences in the natural father ratio between groups ($\chi^2_{(2)} = 10.41, p=0.006$). Results of residual analysis (Table 6-8)¹³ show significantly positive residuals for applicability of “father is natural or adopted” in the group without criminal history, with significantly negative residuals in the group with juvenile histories of two or more occurrences. This suggests that the natural father ratio is high in the group without criminal history and low in the group with juvenile histories of two or more occurrences.

Table 6-7. “Father Natural or Adoptive” by Delinquency Career (Unit: %)

	No delinquency career group	1-time delinquency group	2-or-more-times delinquency group
“Father is natural or adoptive” is applicable	78.5	72.3	66.1
“Father is natural or adoptive” is not applicable	21.5	27.7	33.9
Total	100.0 (n=321)	100.0 (n=184)	100.0 (n=221)

¹³ Adjusted standardized residuals (ASR) are standardized residuals for each cell (value of the residual divided by the square root of the expected frequency), adjusted by row sum and column sum for given cells. The ASR is calculated as follows where observed frequency = O, expected frequency = E, row sum = nR, column sum = nC, and combined sum = nT: $ASR = \frac{O - E}{\sqrt{E(1 - \frac{nR}{nT})(1 - \frac{nC}{nT})}}$

Table 6-8. Adjusted Standardized Residuals (ASR) for Each Cell in Table 6-7

	No delinquency career group	1-time delinquency group	2-or-more-times delinquency group
“Father is natural or adoptive” is applicable	2.9 (**)	-0.3	-2.8 (**)
“Father is natural or adoptive” is not applicable	-2.9 (**)	0.3	2.8 (**)

** : p < 0.01

Next, the degree of abuse from families (including guardians) is examined. Here, an indicator of abuse was formulated by assigning 2 points to an answer of “often” and 1 point to an answer of “sometimes” in response to each survey question. (There were zero affirmative responses for the item “forced intercourse or threat of the same,” and thus, it was excluded.) The minimum possible total point is 0, with a maximum possible total of 12. The Cronbach’s alpha for item groupings was 0.77, with adequate internal consistency.

Table 6-9 shows the average and standard deviation of abuse points for all three groups. Analysis of variance showed that results of groups were significant ($F_{(2,724)} = 6.81, p = 0.001$). Due to obvious unequal variance, multiple comparisons were conducted using the Games-Howell method that does not assume homoscedasticity, resulting in significant difference between average values of the two or more delinquency occurrence group and the non-delinquent group ($MSe = 4.18, p = 0.002$). Results suggest a relationship between abuse from family members and delinquency.

Table 6-9. Summary of Abuse Points by Delinquency Career

	n	Average	SD
No delinquency career	322	1.02	1.687
1 occurrence of delinquency	184	1.35	2.043
2 or more occurrences of delinquency	221	1.67	2.476
Total	727	1.30	2.061

Section 3 Summary

Analytical results based on official statistics as well as research results based on the questionnaire survey and delinquency record data suggest a relationship between home environment and delinquency. Therefore, juveniles with less desirable home environments are considered to have a higher probability of participating in crime even today. Interestingly,

analysis from official statistics shows the likelihood that importance of home environment decreases with the increase in age. This finding is consistent with results of well-known prior research in the United States, showing that risk factors for violence differ according to age group (Office of the Surgeon General 2001).

Moreover, mere circumstances of not having both parents or having a father who is not the natural father cannot be perceived as causing delinquency. The author believes that these circumstances invite interpersonal conflicts within families and that insufficient educational considerations eventually lead to children committing delinquent acts. This chapter's research results show how critical it is for political actions regarding disadvantageous home environments to consider juvenile delinquency.

For instance, policies providing economic and psychological support to single-parent families should also be evaluated from the perspective of counteracting juvenile delinquency. Welfare/educational programs and institutional designs focusing on child abuse might also contribute to the prevention of juvenile delinquency in a broad sense. Political funding that targets juvenile delinquency should not be limited only to criminal justice. This chapter's results suggest that for counteracting juvenile delinquency, comprehensively proceeding with multiple types of policies—criminal, welfare, educational, and labor—is essential for supporting homes, schools, and communities in raising children.

Note:

The analysis in this chapter was made possible by the cooperation of those who participated in the questionnaire survey. We thank them for their cooperation.

Chapter 7 Education Level and Delinquency—Consideration Based on Official Statistics

Similar to studying the relationship between home environment and delinquency in the previous chapter, methods using quantitative analysis to clarify the relationship between social levels and delinquency can be broadly classified into two approaches—utilizing official statistics and social survey data. Variables indicating social level are included among official statistics utilized by the first approach. However, these statistics are rather limited. This chapter contains an outline of how official statistics can be used for the purpose of research in order of relevance.

Section 1 Overview of Official Statistics

First, National Police Agency statistics pertaining to juveniles arrested (“Status of Juvenile Guidance and Protection for the Year ____” hereinafter referred to as “police statistics”) include (1) whether the individual was in school at the time of the delinquent act, and if so, the type of school, or if the individual was not a student, (2) the school last attended and whether the individual graduated or dropped out from it. Moreover, the previously reported “economic circumstances of family, etc.” is not currently included in the survey.

Second, court statistics (“Annual Report of Judicial Statistics,” referred to in this chapter as “judicial statistics”) include surveys of juveniles who were not handled as a simple referral¹⁴ by police departments and received a final disposition from Family Court, including (3) whether the individual was in school at the time of the delinquent act, and if so, the type of school, and (4) if the individual was not a student, the school last attended by graduation/dropout status. In addition, individuals were surveyed because statistical values were publicized on employment status, lifestyle level of family (affluent/average/poverty/on welfare), and employment status of the guardian—until 1998; however, these are not currently included in the survey.¹⁵

Third, statistics pertaining to juveniles who have entered juvenile detention centers and reformatories (“Annual Report of Correctional Statistics,” referred to in this chapter as “correction statistics”) include survey results on employment status, highest education achieved, job type of individual/guardian, and family lifestyle level. Correctional statistics include the highest variety of indicators of social level. Notably, however, referral to juvenile detention centers and to reformatories is determined by Family Court (Articles 17 and 24 of the Juvenile Act).

Dispositions of Family Court are determined after considering the protective capability of the juvenile’s family. In fact, previous empirical research shows that parents’ employment and economic status is weighed heavily in such dispositions (Mugishima and Tamura 1978).

¹⁴ While juvenile cases are forwarded to Family Court as a general rule, less serious cases are actually concluded through relatively simple case processing in police departments, based on three-party consultation between the Supreme Court, Supreme Public Prosecutors’ Office, and the National Police Agency. See the Shonen Jitsumu Kenkyukai ed. (2010) for more background on the operation and applicability standards of simple referrals.

¹⁵ Upon the author’s confirmation with the Supreme Court General Secretariat Public Relations Division in June 2008, these items are not included in the revised, post-1999 format of the questionnaire (referred to as a “case log” in Family Court). It is regrettable that items continuously surveyed for many years were deleted due to format simplification.

Assuming that “with trends toward harsher punishment (in recent years), juveniles from poor economic backgrounds and disadvantageous protective environments are being referred to reformatories” (Hamai 2007: 151), it is problematic to make declarations such as, “the more serious the level of crime, the higher the increase in ratio of family poverty (Iwata 2007: 217),” solely based on the fact that more youth in correctional facilities are from lower social levels. It is impossible to thoroughly examine the issue of delinquency and social levels using correctional statistics, as long as the element of selective sanctions (the higher the level of poverty the more likely it would be for the individual to be referred to a correctional facility) cannot be excluded.

Evidently, therefore, only the following statistics can be used when studying the relationship between social level and delinquency: from police statistics, (1) whether the individual was in school at the time of delinquency and the type of school (2) last school attended and graduation/dropout status; from judicial statistics, (3) whether the individual was in school at the time of delinquency and the type of school (4) last school attended and graduation/dropout status.

Hence, in this chapter’s analysis, the relationship between educational level and delinquency is examined under the assumption that educational history is an indicator of social level.

Section 2 Research Methods

Police statistics and judicial statistics survey which school the participant is attending, or if the participant is not attending any school, the school last attended, and whether the participant graduated or dropped out, categorized by major crime type. However, both sets of statistics publish only the age group (aged 14–19 years), along with the attendance/education history of individuals regardless of gender.

On the other hand, social survey data pertaining to school attendance/educational history that covers the entire juvenile population is available in the census and the Employment Status Survey. For reasons explained later, I decided to use census data. Every 10 years, the census form incorporates items pertaining to type of school currently attended and last school attended. The most recent data was obtained from the 2010 census. Moreover, the census asks for the last school from which the respondent graduated, but schools from which the respondent dropped out are not included.

Here, the issue requiring clarification is the wide disparity in delinquency occurrence ratios by age and gender as well as variations by crime type. For example, the overwhelming majority of brutal crimes are committed by males. Moreover, individuals aged 18–19 are more likely to

be arrested for brutal crimes than individuals aged 14–15. Therefore, little meaning lies in, for example, simply comparing distributions of school attendance/educational history for males and females aged 14–19 (police statistics) arrested for brutal crimes with distributions of school attendance/educational history for all males and females of the same age level (census data), regardless of arrest record. The reason is that attendance/educational history is a variable for which distributions differ widely according to gender and age.

Hence, in this chapter, the procedures shown in the following examples are adopted.

First, distributions of attendance/educational history by gender and age were formulated for the target year (2000 in the example shown in Table 7-1) based on attendance and educational status values by age and gender from public census data (left side of Table 7-1).^{16 17} Attendance/

Table 7-1. School Attendance/Educational History of Total Population by Gender (2000 census)

	Currently attending middle school (unit: individuals)	Currently attending high school/university (unit: individuals)	Not attending school—graduated from middle school (unit: individuals)	Not attending school—graduated from high school (unit: individuals)		Currently attending middle school	Currently attending high school/university	Not attending school—graduated from middle	Not attending school—graduated from high school
Male	Aged 14 yrs	706,575	0	0		14 yrs	100.0%	0.0%	0.0%
	Aged 15 yrs	379,326	344,561	14,462	0	15 yrs	51.4%	46.7%	2.0%
	Aged 16 yrs	7,421	718,865	39,031	0	16 yrs	1.0%	93.9%	5.1%
	Aged 17 yrs	4,412	714,478	53,738	0	17 yrs	0.6%	92.5%	7.0%
	Aged 18 yrs	3,096	583,316	55,878	129,800	18 yrs	0.4%	75.6%	7.2%
	Aged 19 yrs	2,569	451,665	55,878	273,451	19 yrs	0.3%	57.6%	7.1%
Female	Aged 14 yrs	671,001	0	0		14 yrs	100.0%	0.0%	0.0%
	Aged 15 yrs	359,614	335,459	9,171	0	15 yrs	51.1%	47.6%	1.3%
	Aged 16 yrs	6,996	696,491	24,720	0	16 yrs	1.0%	95.6%	3.4%
	Aged 17 yrs	4,267	698,010	34,365	0	17 yrs	0.6%	94.8%	4.7%
	Aged 18 yrs	4,031	590,190	34,299	108,850	18 yrs	0.5%	80.0%	4.7%
	Aged 19 yrs	4,888	481,611	34,299	225,441	19 yrs	0.7%	64.5%	4.6%

Note: Prepared by the author using the “Census Report” from the Ministry of Internal Affairs and Communications Statistics Bureau

¹⁶ Census reports published before the 2000 census did not include summary tables showing the most recently graduated school by age (for each age), but included age data only in increments of 5. In other words, this data enables an understanding of the total number of individuals aged 15–19 years according to most recently graduated school. Summary tables of the number of individuals by age (for each age) in school are published by school type. Due to these circumstances, the values for a portion of the cells could not be determined when establishing the format shown in Table 7-1. Specifically, the breakdown of “not attending/graduated from middle school” and “not attending/graduated from high school” for ages 18 and 19 are unknown. Hence, for 2000, the number of individuals male and female aged 19 years “not attending/graduated from middle school” was assumed to be the same as those aged 18 year. Making this assumption enables to insert values for all cells. Furthermore, because the number of individuals never enrolled in school was minimal, it was decided to exclude it from the analysis.

¹⁷ Initially, the problem mentioned in footnote 17 was similar to the problem in data published in the 2010 census. In October 2011, the author was commissioned by the Ministry of Internal Affairs and Communications Statistics Bureau for “a newly created statistical table to meet the needs of various uses” and proposed the creation of a table with aggregates of most recently graduated school by age (for each age). The proposal was adopted, and the statistical table was published in January 2013. Hence, it is now possible to formulate a table format for 2010 data similar to Table 7-1 using public data, without making the assumption mentioned in footnote 17. A list of additionally created statistical tables that include this table is publicly available at the Ministry of Internal Affairs and Communications Statistics Bureau’s website. The URL is <http://www.stat.go.jp/data/kokusei/2010/tsuika21.htm> (last accessed June 30, 2013).

**Table 7-3. Calculation Methods for Hypothetical Distributions of Attendance/Educational History
(Unit: individuals)**

	Male	Female		Currently attending middle school	Currently attending high school/university	Not attending school—graduated from middle school	Not attending school—graduated from high school
Aged 14 yrs	572,700	62,704	14 yrs	572,700	0	0	0
Aged 15 yrs	1,074,336	79,426	15 yrs	551,939	501,354	21,043	0
Aged 16 yrs	1,676,298	129,589	16 yrs	16,254	1,574,553	85,491	0
Aged 17 yrs	1,918,755	146,310	17 yrs	10,957	1,774,345	133,454	0
Aged 18 yrs	1,818,428	83,606	18 yrs	7,292	1,373,827	131,604	305,705
Aged 19 yrs	1,212,285	87,786	19 yrs	3,975	698,791	86,451	423,068
			14 yrs	62,704	0	0	0
			15 yrs	40,558	37,834	1,034	0
			16 yrs	1,245	123,945	4,399	0
			17 yrs	848	138,637	6,826	0
			18 yrs	457	66,918	3,889	12,342
			19 yrs	575	56,656	4,035	26,520
			Total	1,269,504	6,346,860	478,226	767,636
			(Ratio)	(14.3%)	(71.6%)	(5.4%)	(8.7%)

Note: Totals might not match the breakdowns because the first decimal place has been rounded up.

Calculating distributions of attendance/educational history in this manner demonstrates that the breakdown of juveniles by gender and age results in the exact same distribution as measured values of individuals arrested for brutal crimes; this is nothing but the expected value for distributions of attendance/educational history when assuming these have been randomly selected from the total population. In other words, this enables study of the relationship between educational level and delinquency by comparing this distribution with actual distributions of attendance/educational history of the total population of males and females aged 14–19 arrested by police for brutal crimes in the same year.¹⁹

In this chapter, census data, police statistics, and judicial statistics from 1980, 1990, 2000, and 2010 were used to clarify conditions in the most recent years. However, only police statistical data from the years 1980, 2000, and 2010 were used because tables with attendance/educational history were not included in “Status of Juvenile Guidance and Protection During the Year 1990.” Data used from police statistics were for brutal crime, violent crime, and theft. Data from judicial statistics were for brutal crime, violent crime, theft, violations of the Stimulants Control Act, and violations of the Poisonous and Deleterious Substances Control Law.²⁰

¹⁹ In accordance with census data, dropouts were treated as graduating at the previous school level. Furthermore, attendance/educational background and classifications in judicial statistics included categories of “other” and “unknown.” The actual numbers were small enough to be disregarded; thus, they were excluded from total aggregations.

²⁰ Attendance/educational background is surveyed only for penal code offenders in police statistics. Furthermore, while judicial statistics did not include classifications for brutal/violent crimes, for purposes of this research, violations of the law concerning Punishment of Physical Violence and Others such as homicide, robbery, arson, and rape were considered brutal crimes while assaults, bodily injury, threats, and extortion were considered violent crimes. Strictly speaking, of the crimes listed in judicial statistics as violations of the law concerning Punishment of Physical Violence and Others (classified as Special Law Offenses), only those violations stipulated in Articles 1, 1-2, and 1-3 are listed, while assaults, bodily harm, threats, and property destruction are listed as such in police statistics. Crimes stipulated in Articles 2 and 3 of the same law are categorized as “other” comprehensive crime types in police statistics.

Section 3 Results and Discussion

Results are as shown in Fig. 7-1 and 7-5. A comparison of brutal crime distributions (Fig. 7-1) shows that police and judicial statistics distributions are closely aligned for a given year because for brutal crimes, almost no cases result in simple referrals. While the expected value in all periods has the highest ratio for those currently in high school/university, the measured values show that approximately 50–60% comprise those not in school/graduated from middle school. The results clearly show that the percentage is much higher for those with low educational levels.

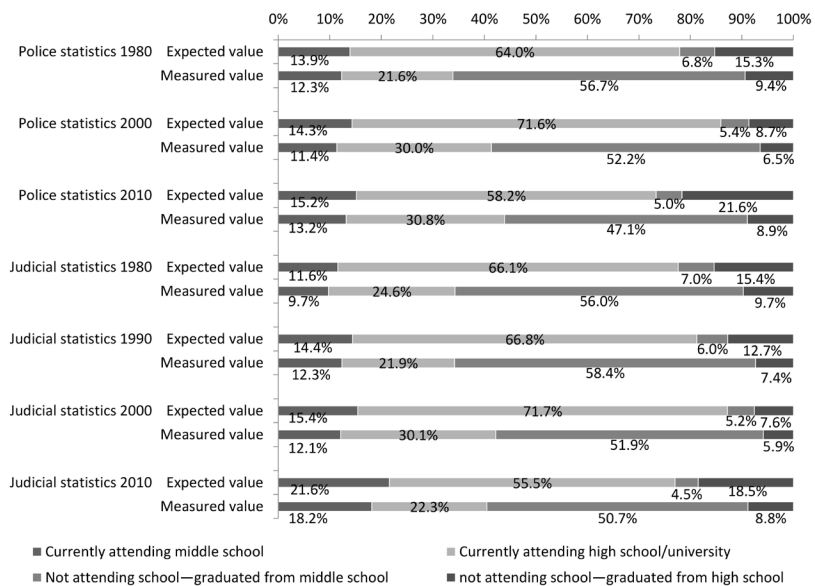


Fig. 7-1. Expected and Measured Values for Attendance/Educational Background Distributions (Brutal Crimes) (Unit: %)

Police and judicial statistics distributions for violent crime (Fig. 7-2) are also similar because for violent crimes, since almost no cases of violent crime result in simple referrals. Similar to brutal crimes, the expected value in all periods has the highest percentage for those currently in high school/university; in contrast, the measured values show that approximately 30–40% comprise those not in school/graduated from middle school.

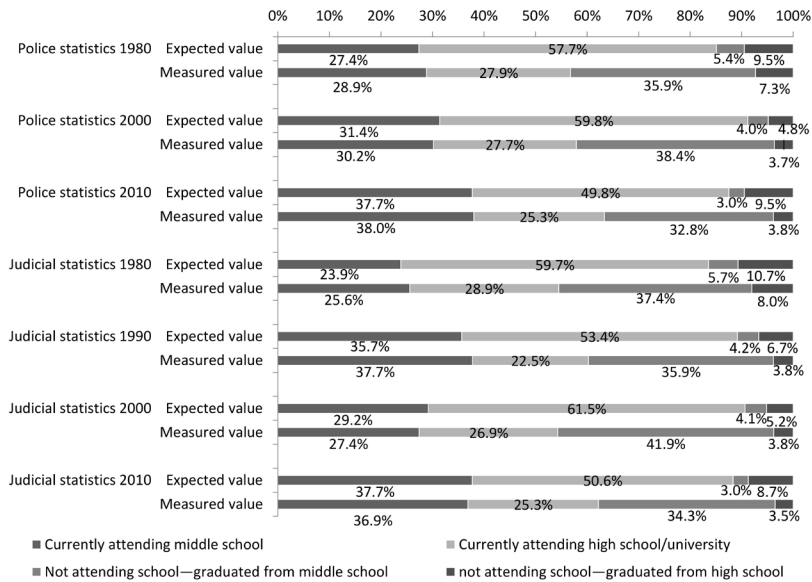


Fig. 7-2. Expected and Measured Values for Attendance/Educational Background Distributions (Violent Crimes) (Unit: %)

In the case of theft as a crime type with a comparatively large number of cases that result in simple referral, according to Fig. 7-3, there were no obvious differences between the police and judicial statistics distributions for 1980. Conceivably, there were no major differences in distributions of attendance/education history for cases that resulted in simple referral and those that did not. In contrast, the ratios of police and judicial statistics for those not attending/graduated from middle school were quite different in 2000 and 2010—much higher in cases that resulted in simple referral (that become subjects in judicial statistics).²¹ With regard to theft, even though both expected and measured values are highest for those currently attending high school/university in any time period, there were clear differences between measured and expected values. Measured values for ratios of those not attending/graduated from middle school are much higher than expected values.

²¹ Possibly, cases involving individuals in school are more likely to result in simple referral.

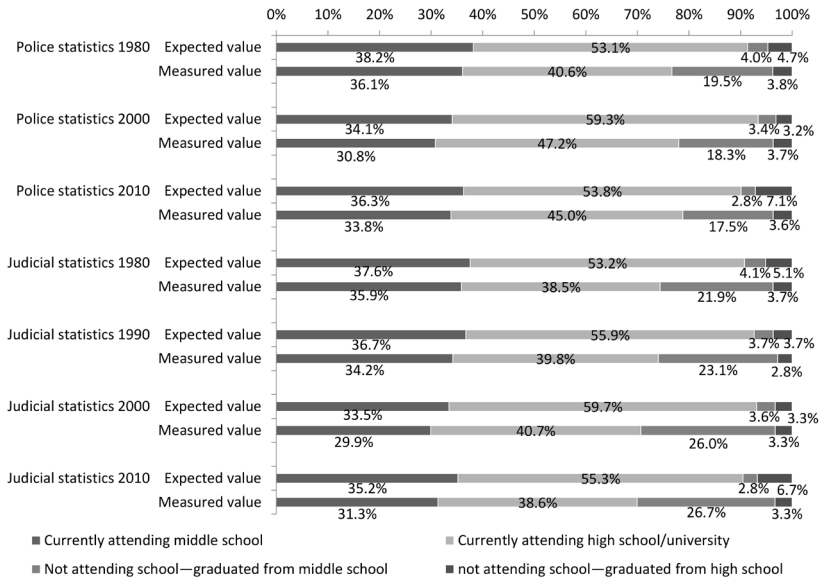


Fig. 7-3. Expected and Measured Values for Attendance/Educational Background Distributions (Theft) (Unit: %)

Violations of the Stimulants Control Act (Fig. 7-4) and of the Poisonous and Deleterious Substances Control Law (Fig. 7-5) show that both these violations, regardless of year, have high expected values for ratios of individuals currently attending high school/university, while measured values show the highest ratios for individuals currently not attending school/graduated from middle school. A particularly unique characteristic regarding violations of the Stimulants Control Act is that 80% to 90% of actual measured values are individuals not attending/graduated from middle school. Results clearly show that individuals with low educational levels have high ratios of delinquency.

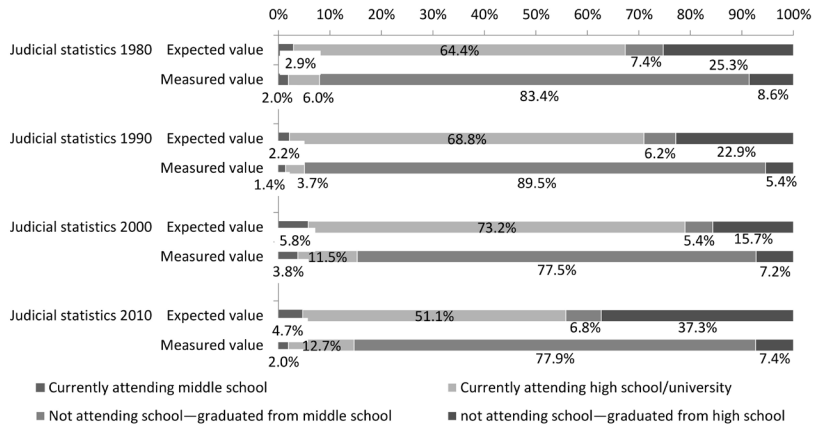


Fig. 7-4. Expected and Measured Values for Attendance/Educational Background Distributions (Violations of the Stimulants Control Act) (Unit: %)

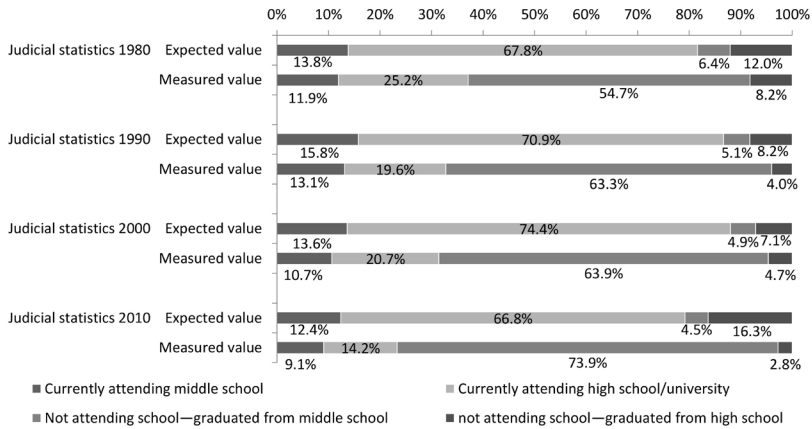


Fig. 7-5. Expected and Measured Values for Attendance/Educational Background Distributions (Violations of the Poisonous and Deleterious Substances Control Law) (Unit: %)

From these results, actual values for ratios of individuals not attending/graduated from middle school are clearly higher than expected values for any crime type. When viewed by crime type, the relationship between educational level and delinquency is clearly manifested in relation to brutal and drug-related crimes.

Section 4 Summary

The above analysis clearly shows that juveniles with lower education levels have a higher tendency to participate in crime. Results suggest that the relationship between education level

and delinquency is particularly strong for brutal and drug-related crimes.

Furthermore, it is important to note that results showing that even in theft crimes such as shoplifting, which comprise the majority of relatively minor offenses committed by juveniles, the ratios of not attending/graduated from middle school are much higher than expected values. This is due to the following.

Many arguments that reject the weakening relationship between social level and delinquency (popularization of delinquency) can be classified into those who believe—or not—that juvenile delinquents are transient actors; in other words, the logic that “the popularization of delinquency is due to those acting temporarily as juvenile delinquents” (Nakagawa 1982; Kawabe 1991). However, according to this chapter’s research results, even transient delinquency, or the majority of theft crimes, are actually committed by juveniles within a certain level of society. In other words, regardless of whether the offense is transient, it is difficult to make the case that delinquency is becoming more common.

In either cases, this chapter’s concludes that the validity of the “popularization of delinquency” discourse deserves minimal credence. While arriving at instant practical implications from this conclusion is difficult, at the very least, the evidence points to the following: the framework and principles of Japan’s juvenile court system, focusing on youth protection as a premise, retain a certain legitimacy even today.

As indicated by Hayami (1989: 121), the “popularization of delinquency” discourse emphasizes diminishing differences between delinquent juveniles and average juveniles. Therefore, “consequently, differences between both groups are sought at the level of action,” and countermeasures against delinquency, “lean toward action-centered control models.” On the other hand, the juvenile court system, based on principles of the Juvenile Law, is a “correctional model based on personalism,” which operates from the basic principle that correction of juvenile delinquents, whose character formation happened in inferior environments different from those of average youth more greatly benefits both the individual and the society.

In current Japanese society in which many skeptical voices are raised toward the current system that treats juvenile offenders differently from adults, a standpoint of devising delinquency measures based on an action-centered control model seems to be becoming dominant. Perhaps the premise of such circumstances is awareness of situations that can be likened to “the popularization of delinquency” discourse. This chapter presented evidence that the nurturing environment of average juveniles still differs from that of juvenile delinquents. Once this reality is recognized, I believe that the correctional model based on personalism will

continue to maintain its legitimacy.

(To be continued in Okabe (2017).)

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Erratum

The bibliographic information of the following literature was missing in the reference list of Okabe (2016).

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