Opportunities and Challenges in Using Administrative Justice Data for Longitudinal and Network Research

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Abstract

This paper explores ways in which data on the administration of justice held by the Canadian Centre for Justice Statistics (CCJS) have been used, and could be used, for longitudinal and network research on delinquency and crime, and some problems associated with such research. The paper focuses mainly on the Incident-Based Uniform Crime Reporting Survey (UCR2), but also considers the Youth Court Survey (YCS) and Adult Criminal Court Survey (ACCS). Although none of these surveys has a unique identifier for individuals, they have been used to do longitudinal research on the recorded “criminal careers” of accused offenders, by linking the records over multiple years for each accused person, matching on soundex code, sex and date of birth. Some results are presented. Research on delinquent and criminal networks would require linking together incidents involving overlapping sets of co-accused in different incidents.

Key Words: Longitudinal; networks; criminal; delinquent; UCR2.

1. Longitudinal research on crime and delinquency

1.1 Research questions in life-course criminology

Life-course criminology has become one of the major paradigms for the study of crime and delinquency (Sampson and Laub, 1993; Laub and Sampson, 2003). It considers parameters of the criminal career, or sequence of crimes committed over the life-span, and their causes and consequences. Key parameters include:

- The age of onset and termination of offending.
- Age-specific and cumulative prevalence and rate of offending, and the contribution of each to the age-specific volume of crime.
- Frequency of offending (i.e. the number of offences in the criminal career).
- Specialization versus versatility in the types of crimes committed.
- Escalation/de-escalation/stability in the seriousness of offending.
- Co-offending (i.e. committing crimes with accomplices).

1.2 Data sources for life-course research in criminology

Delinquent and criminal behaviour over the life-course are usually studied using custom data sets. Data are collected prospectively, following the sample as they age, and incorporating data from interviews and from administrative records such as police files or school records (Liberman, 2008). Because of the labour-intensiveness of this mode of data collection, samples are usually relatively small, comprising 500-2,000 cases.

Alternately, data may be taken exclusively from administrative records. This strategy permits the use of much larger samples or populations, and obviates the need for prospective following of subjects over a lengthy period of time. The main cost is the restricted range of variables available, especially on the correlates of offending. The author has adopted this strategy to study delinquent criminal careers of Canadian youth, using data from three surveys maintained by the Canadian Centre for Justice Statistics:

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• the Incident-Based Uniform Crime Reporting Survey (UCR2),
• the Youth Court Survey (YCS), and
• the Adult Criminal Court Survey (ACCS).

1.3 Selected results

Figure 1.3-1 is taken from a report on delinquent careers of Canadian youth between the ages of 5 and 17 inclusive, using data on police-recorded crime of age cohorts born in 1987 and 1990, from the UCR2 Survey (Carrington, 2007). It shows the percent of the age cohort who were first identified by police as offenders (i.e. the age of onset of recorded offending) at each year of age. For males the peak years of onset are 15 and 16; prevalence of recorded offending is lower in females, and the peak ages of onset are 14 and 15.

Figure 1.3-1
The peak ages of onset of police-recorded offending are 14-16 years of age


Figure 1.3-2 shows similar information, but for “court careers” (the sequence of court cases in offenders’ lives) over the ages of 12-21 inclusive, based on data from the YCS and ACCS. The peak age of onset for incidents that resulted in youth court or criminal court proceedings, and for cases resulting in a finding of guilt, was 18 at the time of the incident (Carrington, Matarazzo and de Souza, 2005).
Figure 1.3-2
The peak age of onset of court careers is 18

Figure 1.3-3
The “age-crime curve”: age-specific volume of crime, by sex


Figure 1.3-3, based on UCR2 data, shows the age-specific volume of recorded crime for ages 5-17 inclusive, by sex. There appears to be a rapid increase, or “take-off”, in the volume of recorded crime after the age of 11, followed by a tapering-off after 15 (for females) and 16 (for males). Life-course criminologists have asked whether this is primarily due to:

- An increase in prevalence; i.e. the proportion of the population who participate in crime, or
- An increase in the rate of offending, or
- Neither, but the result of under-recording by police of crime committed by children under 12, since they are below the age of criminal responsibility.

Figure 1.3-4
Observed and fitted age-specific prevalence, males, combined cohorts


Figure 1.3-5
Comparison of growth in prevalence and rate of offending, both sexes, combined cohorts

Analysis of UCR2 data suggested the first explanation. Figure 1.3-4, fitting the spline curve \( \log(y) = 0.48(x - 5.25) - 3.5 + (x > 11.75)(0.30(x - 11.75) - 0.09(x - 11.75)^2 + 0.00176(x - 11.75)^3) \) shows that the age-specific prevalence of recorded offending by males increases exponentially up to the age of 12, then more than exponentially from the ages of 12 to 15. Adding a parameter for a step-increase at 12, testing the third hypothesis, did not improve the fit of the curve. Figure 1.3-5 shows that the rate of offending increases much less rapidly, thus disconfirming the second explanation.

Figure 1.3-6 shows the uneven distribution of recorded delinquent activity among offenders. A few “chronic” offenders, with 5 or more recorded offences during their teenage years, are responsible for almost half of all recorded crime committed by this cohort. On the other hand, more than 60 per cent of offenders have only one recorded offence and are responsible for only one-quarter of recorded crime. This result, first discovered by Wolfgang and associates (1972), motivated the adoption of policies of selective incapacitation and intensive supervision of chronic offenders.

**Figure 1.3-6**

A disproportionate amount of crime is due to a few chronic offenders


Figure 1.3-7 shows the peak in co-offending in childhood and early adolescence, and the decline with age thereafter. This result, which has been replicated by research with other datasets, is susceptible of several different explanations:

- Age-related changes in the type of crime committed, from crimes characterized by co-offending to those characterized by solo offending;
- Selective attrition of offenders with a tendency to co-offend;
- Recruitment versus experience;
- “Maturation”: i.e. age-related decline in gregariousness and/or increase in autonomy.
Figure 1.3-7
Co-offending by the age of the offender

![Graph showing co-offending by age of offender]

Source: Adapted from P.J. Carrington. Group crime in Canada. *Canadian Journal of Criminology* 44 (3) (2002): 277-315, Figure 1.

Figure 1.3-8
Percent of incidents involving co-offending, by the age of the offender and selected types of offence

![Graphs showing co-offending by age and type of offence]


Figure 1.3-8 shows variations in the age/co-offending curve for different types of offences, suggesting that changes with age in the type of offence may be part of the explanation. Figure 1.3-9 shows a complex relationship between co-offending and criminal experience: co-offending decreases with criminal experience (the sequence number in the criminal career of the incident) for the great majority of offenders (those with 7 or fewer incidents in their careers),
but is approximately constant with experience for high-activity offenders, and increases with experience for younger offenders.

**Figure 1.3-9**

**Four co-offending trajectories**


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## 2. Network research on crime and delinquency

What is the social structure of co-offending? There are two opposed views:

- Co-offending is a manifestation of organized criminal groups; or
- Co-offending arises from the more-or-less random activities of “flexible and transient…microgroups” (LeBlanc and Fréchette, 1989).

Network analysis of longitudinal co-offending patterns could resolve this question. Non-randomness in co-offending would suggest criminal organization; randomness would suggest the converse. Examples of non-randomness in network structure include:

- Repetition: a tendency for co-offending pairs, triplets, etc. to be repeated (i.e. not to be transitory);
- Transitivity (clustering)
- Centrality (a tendency for one or some offenders to be central in the network).

The extent of these types of non-randomness could be estimated using network analysis (Carrington, Scott and Wasserman, 2005). Figure 2-1 shows the network structure among a hypothetical set of 8 offenders involved in 9 co-offending incidents, where the numbers on the lines indicate the number of incidents of co-offending between each pair of offenders. There is evidence of repetition (e.g. Jill co-offenders twice with Jamie and Jim), of transitivity, or clustering (Jill co-offends with Jamie and with John, who also co-offend with each other), and of centrality (Jill co-offends with four of the seven other offenders). While this evidence is visual and impressionistic, there are regression-like methods of network analysis that allow estimation of the strength and statistical significance of such tendencies.
References


