PROPORTIONS OF CRIMES ASSOCIATED WITH ALCOHOL AND OTHER DRUGS IN CANADA

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Executive summary

Research from a number of countries shows that there is a strong association between the use and abuse of drugs and alcohol and the commission of criminal acts. However, few in-depth studies have examined the nature of the links, and no comprehensive Canadian studies of this kind exist. In view of the considerable social costs felt to be caused by drug and alcohol abuse in Canada, the Canadian Centre on Substance Abuse initiated a set of studies aimed at estimating (1) the strength of the associations among different types of crimes and the use and abuse of psychoactive substances, and (2) the share of crimes in Canada that can be attributed to the use and abuse of alcohol and drugs.

It is not easy to estimate the role of alcohol and drugs in the total volume of crimes committed in Canada. Most crime incidents remain unreported and undetected by the authorities. Police reports, which represent the most complete source of information on crimes, often lack information on the perpetrator, and a large proportion of these incidents would not be considered criminal by the courts. Data can be obtained from incarcerated offenders, but it is difficult to generalize any findings from prisoners to all crimes, as this information concerns only the most serious crimes and criminals in Canada.

Methodology: As no single source of data is satisfactory for the purpose of this analysis, data were obtained from several sources, including surveys of federal prison inmates, provincial prison inmates and arresting police officers. First, data from a Correctional Service of Canada (CSC) survey of 8,598 male federal inmates admitted from 1993 to 1995 was analysed with regard to crimes committed and the use of alcohol and/or illicit drugs. Convicted offenders are sent to federal penitentiaries if their sentences are two years or longer. Second, in order to provide more detailed information, 469 in-depth interviews were conducted in 1999-2000 with newly admitted male inmates in the federal prisons of Québec and Ontario (referred to here as the FII study). Third, in order to provide comparable data on provincial inmates, interviews were also conducted with 100 female and 94 male inmates in two provincial prisons in Québec. Fourth, in order to assess the extent to which the findings on inmates can be generalized to less serious crimes and criminals, a special study was conducted on arrestees, using information recorded by police in 14 Canadian cities on 1,890 individuals arrested during May and June of 2000.

The data in the federal and provincial inmate studies are based on self-reports. There is always a risk of relying on such information, especially as it pertains to sensitive areas of behaviour (even among members of the general population). However, the results from the various studies, which in part used different methods of data collection, generally show concordant findings. The study of arrestees used the observations of the arresting officer as data, but the findings on behaviour patterns of these offenders did not differ greatly from those based on the self-reports of prison inmates. In addition, the responses to questions on drug use and criminal activity during the 36 months preceding the last arrest showed that inmates in the interview situation were willing to report on a great many undetected crimes that they had committed and on their extensive use of illegal drugs. These and other indications make the authors believe that the findings are based on sufficiently valid data.

Results

Use of alcohol and illicit drugs: A great proportion of inmates in both federal and provincial prisons reported using illicit drugs while free. Slightly more than half of the federal inmates (53% in the CSC study and 52% in the FII study) reported the use of illicit drugs during the six months immediately prior to their last arrest. Many used frequently, with 30% reporting the use of illicit drugs at least a few times a week. Cannabis was most widely used during the six months (43% of the inmates in the CSC sample), while 28% had used cocaine and 7% had used heroin. The proportion of alcohol users among federal inmates does not differ much from that found among males and females in the same age group in the general population. In all, 40% of federal inmates had used alcohol and at least one illicit drug together on the same occasion during this period, and 14% had used these substances jointly at least a few times a week. Rates of alcohol and illicit drug use were similarly high among the Québec provincial inmates. Sixty-two per cent of the inmates in the male prison and 64% of female inmates had used illicit drugs during the six months preceding arrest. About 90% of male and female provincial inmates in the two Québec prisons had used alcohol during the same period.

Dependence on illicit drugs and alcohol: Inmates in both federal and provincial prisons scored higher on psychometric scales measuring alcohol and drug dependency when compared with the general population. According to the Alcohol Dependence Scale (ADS), 16% of the male federal inmates were dependent on alcohol, while the Drug Addiction Severity Test (DAST) indicated that 31% were dependent on one or more illicit drug. Approximately one in twelve federal inmates (8%) were assessed to be dependent both on drugs and alcohol. In all, 38% of male federal inmates were dependent on at least one of these substances.

There were similarly high rates of alcohol and/or drug dependence among provincial male and female inmates. Indeed, the provincial inmates scored even higher on drug dependency than federal inmates, with 43% rated as drug dependent. Nearly one half (48% of men and 49% of women) of the inmates in the two Québec provincial prisons were dependent on either drugs or alcohol or both substances. There were relatively small differences between genders, with with 15% of males and 17% of females being alcohol dependent and 44% of male and 42% of female provincial inmates diagnosed drug dependent. Eleven per cent of both male and female provincial inmates were dependent on both alcohol and drugs.

Somewhat higher rates of dependence were reported among arrestees but it must be noted that these estimates are not based on well-established dependency scales, but rather on an assessment by the arresting officer if the offender was an “abuser” of drugs or alcohol. Fifty-five per cent of male and 47% of female arrestees were judged by the arresting officer to be abusers of either or both substances, with the combined share being 54%.

Relationship of dependency to type of offence: As most federal inmates are imprisoned for more than one crime incident, the crime for which they had been sentenced to the longest prison term was chosen for detailed analysis. The most serious crime of about 15% of the drug-dependent federal inmates was a drug crime. Alcohol-dependent federal inmates were much more likely to have committed a violent crime than were drug-dependent inmates, while drug-dependent inmates were more likely to have committed a gainful crime.

About one-third of the federal inmates who had committed robberies, break and enters and thefts as their most serious crime were drug dependent. Fraud offenders were the least dependent on any substance with only 16% being dependent on drugs or alcohol. Sex offenders were also relatively free of dependence; it was estimated that about 19% were dependent on either alcohol or drugs. Homicides and assaults were about equally committed by individuals who were alcohol or drug dependent.

Use and dependency as they relate to volume of crimes committed: Alcohol and drug users, particularly dependent users, reported higher volumes of crimes committed. In the more detailed interviews with federal inmates, information was obtained using a monthly calendar on all crimes committed during the 36 months prior to the last arrest. Several of the inmates reported committing thousands of crimes during that time. Most were of a relatively non-serious nature, such as drug possession and trafficking, shoplifting and minor thefts, as well as prostitution among the female prisoners. Federal inmates who reported having used neither drugs nor alcohol during a six-month period in freedom reported an average of 1.7 crimes a week, while those who used one or more substances without being dependent on any had committed 3.3 crimes a week. The inmates who were dependent on drugs and/or alcohol had committed the most crimes – averaging about 7.1 crimes in a one-week period.

Intoxication at the time of committing a crime: More than half (54%) of offenders entering federal custody reported having been under the influence of a psychoactive substance when they committed the most serious crime on their current sentence. Alcohol intoxication was more common than drug intoxication (24% vs. 19%). Another 14% of federal inmates reported having been under the influence of both alcohol and drugs at the time they committed their most serious offence. Thus, in total 30% of federal inmates committed their most serious crime at least under the partial influence of drugs, and 38% committed this crime at least in part under the influence of alcohol.

Similarly high proportions of provincial inmates in the two Québec prisons reported being under the influence of alcohol or drugs when they committed their most serious crime (60% of males and 47% of females). The provincial female inmates were much more likely to report having been intoxicated from drugs only (28%) than were the men in any of the inmate studies (between 15% and 19%). Males in both federal and provincial prisons were more likely to be under the influence of alcohol.

The arresting police officers reported that 51% of arrestees were under the influence of a psychoactive substance at the time of arrest – 53% of men and 44% of women. Alcohol was indicated much more often than illicit drugs. One-third (33%) were assessed as being under the influence of alcohol only, 9% under the influence of illicit drugs only and another 9% under the influence of both alcohol and illicit drugs.

Alcohol intoxication dominated in the various violent crimes committed by the federal inmates. Among assault offenders, 39% reported being under the influence of alcohol at the time of the crime, 9% illicit drugs, and 24% both drugs and alcohol. The corresponding proportions for homicides were 34% only alcohol, 7% only illicit drugs, and 21% both alcohol and illicit drugs. Among those convicted of attempted murder, 30% reported alcohol intoxication, 9% drug intoxication and 24% intoxication from both alcohol and drugs at the

time of the crime. Thefts (32%), robberies (25%) and breaking and entering (24%) were crimes in which drug intoxication predominated, but alcohol intoxication was also relatively high (between 16% and 22% of these crimes), as was the combined intoxication from illicit drugs and alcohol (between 13% and 19% of these crimes).

Where illicit drugs were involved, cocaine and cannabis were the drugs most frequently mentioned by male inmates. Twelve per cent of federal inmates and 16% of provincial inmates reported being intoxicated by cocaine when they had committed their most serious offence, while 7% of federal inmates and 21% of provincial inmates reported they had been intoxicated with cannabis. Cocaine was most often mentioned by female inmates in Québec correctional facilities (27% vs. 9% for cannabis). Heroin was infrequently mentioned by federal inmates (2%) and provincial inmates (1% among males and 4% among females).

Crimes reportedly committed to obtain alcohol or illicit drugs: A significant proportion of crimes are reported to have been committed in order to obtain psychoactive substances for personal use. The proportion of inmates who reported committing their most serious offence in order to obtain alcohol and/or illicit drugs was 23% among federal inmates (14% illicit drugs only, 2% alcohol only and 7% both alcohol and illicit drugs) and 20% among the Québec provincial inmates (14% illicit drugs only, 2% alcohol only and 4% both alcohol and illicit drugs). The corresponding proportion of arrestees who were reported by the arresting officer to have committed their most serious offence in order to obtain alcohol and/or illicit drugs was 18% (15% illicit drugs only, 2% alcohol only and 1% both alcohol and illicit drugs).

Crimes of acquisition were the type of crime most frequently reported to have been committed to obtain alcohol or illicit drugs. Among federal inmates who had committed theft, 46% reported they committed their crime in order to obtain alcohol or drugs (25% drugs only, 3% alcohol only and 17% both alcohol and illicit drugs). Among federal inmates who had committed robbery, 41% reported they committed their crime in order to obtain alcohol or drugs (25% drugs only, 4% alcohol only and 12% both alcohol and illicit drugs). The corresponding proportion of inmates jailed for breaking and entering is 36% (19% illicit drugs only, 5% alcohol only and 11% both alcohol and illicit drugs). Committing a crime to obtain alcohol and/or drugs was much less frequently reported by inmates jailed for crimes of violence (5-6% among those convicted of murder, attempted murder or assault). Only 17% of federal inmates jailed on drug charges committed their most serious crime to obtain drugs, indicating that these offenders were relatively high-level traffickers.

The proportion of crimes attributable to alcohol and illicit drugs: To this point the findings show that alcohol and drug use were strongly related to the commission of crimes. Rates of alcohol and illicit drug use and rates of dependency were very high among federal and provincial inmates and arresting officers frequently reported alcohol or drug abuse among arrestees. Inmates and arresting officers frequently report that crimes were committed under the influence of alcohol or illicit drugs and/or to obtain alcohol or illicit drugs.

At issue is the extent to which alcohol and illicit drugs can be *causally* attributed to the commission of crimes. In itself, the fact that convicted criminals reports high drug use, or that they are dependent on drugs, or that they committed a crime under the influence of

drugs or to obtain drugs would not constitute proof that they would not have committed their crimes anyway. For example, a perpetrator might have used alcohol or illicit drugs "for courage" prior to committing a crime. Similarly, the fact that a crime was committed to obtain drugs does not necessarily mean that this caused the crime to be committed – if the proceeds of a robbery were used to purchase a car, it could not be claimed that cars cause robberies. In order to estimate the proportion of crimes that can be attributed to the use and abuse of psychoactive substances, we need to apply other measures and models of how crimes are caused by these substances. The *attributable fraction* measure is used predominantly in studies of public health where certain risk factors are known for many illnesses and causal linkages are rather clear. Causal models are much harder to come by in the explanation of human behaviour, and human motivations, including motivations for criminal behaviour, are more complex. In order to avoid making questionable causal attributions it was decided that the models underlying attributable fractions must meet strict criteria of causality.

There are two major ways by which illicit drugs and alcohol are causally linked to the commission of crimes in this study:

· First, the proportion of violent crimes attributable to alcohol or drugs was estimated by taking the percentage of inmates convicted of a crime who reported (a) that they were intoxicated at the time of the crime, and (b) that they would not have committed the crime had they not been under the influence of alcohol or drugs at the time.

· Second, a proportion of crimes attributable to alcohol or drug use was estimated from the percentage of inmates convicted of a crime who (a) reported that they had committed the crime to obtain drugs or alcohol and (b) who were rated as alcohol- or drug- dependent.

These estimates are summed, and adjustments made for those offenders whose crimes are linked to alcohol or illicit drugs in more than one way. As the estimates for each type of crime attributable to alcohol or illicit drugs were based on different samples of offenders with varying geographical coverage and no possibilities for instituting weighting in order to arrive at one definite estimate, it was decided that a range of estimates would be used that incorporated the point estimates from the different studies. In order to avoid a false impression of exactness, the range estimates are given as multiples of 5%.

Using this method, the proportion of crimes committed by federal and provincial inmates that are attributed to the use of alcohol and/or illicit drugs in Canada was estimated as being between 40% and 50%. Between 10% and 15% are attributed to illicit drugs only, between 15% and 20% are attributed to alcohol only, and 10% to 20% are attributed to both alcohol and illicit drugs.

Including crimes (mainly crimes of violence) that are a direct outcome of the illegal drug economy, such as crimes linked to turf wars and conflicts over drug debts, would slightly increase the total attributable fraction. Information on the size of this factor is only available from the arrestee study. It indicates that adding this aspect to the two-factor attributable fraction estimate would only add 1 (one) percentage point to the overall estimates. However, the reason for not including such crimes in our calculations of attributable fractions of

drugs and alcohol on crime is conceptual: it does not meet the strict causal criteria that we have established for this fraction.

Crimes such as drug possession, drug trafficking, drug manufacture and drug use are a special category of crimes. The same criteria of compulsion or lack of free choice mediated by intoxication or addiction were used to arrive at estimates of attributable fractions for these crimes as for the other types of crimes. It was estimated that about one fourth (24%) of drug crimes committed by the inmates (mainly drug trafficking) were attributable to intoxication by alcohol or drugs, or the need to engage in gainful crimes to sustain alcohol or drug abuse. However, it is relatively common in the literature to include all such drug-defined crimes in the attributable fraction for drugs on criminality. Doing so assigns a fraction of 100% to the drug crimes. Including the drug-defined crimes in the calculation of the overall attributable fraction in the CSC federal inmate study would increase the total estimate of the fraction of crime attributable to alcohol and/or illicit drugs by about 10 percentage points. It is not included in our estimates.

The proportion of crimes that were attributable to alcohol and/or drugs according to our two-factor estimation method varied somewhat by type of crime. Among the federal inmates, approximately one half (49%) of violent crimes such as homicide, attempted murder and assault were attributed to alcohol and/or illicit drugs (5% drugs only, 28% alcohol only and 16% drugs and alcohol combined). Similarly, one half (50%) of gainful crimes such as theft, break and enter and robbery were attributed to alcohol and/or illicit drugs (20% drugs only, 11% alcohol only and 19% drugs and alcohol combined). As mentioned above, although, in a non-causal sense, all drug crimes are attributable to illicit drugs, it was estimated that about one fourth (24%) of drug crimes committed by the inmates, mainly drug trafficking, were attributable to intoxication by alcohol or drugs, or the need to engage in crimes of acquisition to sustain alcohol or drug use. The proportion of other crimes (not included in the violent, gainful and drug crime categories) that were attributed to alcohol or illicit drugs was estimated at 54% (6% drugs only, 35% alcohol only and 14% alcohol and illicit drugs). As these estimates are derived from data on federal inmates who had been sentenced to two years or more, they only apply to more serious crimes.

There were indications that alcohol and illicit drugs may have played an even greater role in the commission of less serious offences. In the detailed interviews with 469 federal inmates in Ontario and Québec, calendar data were collected on crimes committed in the 36 months prior to imprisonment. These were generally less serious offences such as minor theft or drug infractions. Analyses of a representative subset of these crimes provided a total attributable fraction estimate for all psychoactive substances of 64%. The proportion of these less serious crimes attributable to alcohol and/or illicit drugs was greater for gainful crimes (70% vs. 50% of the more serious crimes) but less for violent crimes (35% vs. 49% of the more serious crimes).

Conclusions and future research possibilities: The main findings of this report confirm the close association between the use of psychoactive substances and criminal behaviour and indicate that a substantial portion of this association represents a causal relationship.

However, conceptual problems remain with the present approach and the research methodology can always be improved. The validity of self-reported data on sensitive

behaviours is always subject to question. There may be a tendency by some offenders to over-estimate the role of alcohol and/or drugs in their crimes. Furthermore, it is not clear whether these estimates would apply today. The findings of this report reflect the prevailing conditions during the period from the mid-'90s to the beginning of the new millennium.

The estimates of the share of crime that can be attributed to drugs and alcohol should be based on studies using more than one type of method. In addition to the event-based methodology used in the studies of this report, longitudinal studies are the best way to examine how the volume of crimes varies with the use and abuse of psychoactive substances. Several suggestions are made in the report regarding the type of research that would serve to check the robustness of the estimates presented.

Foreword

The aim of our empirical research and the analyses of data has been to obtain estimates of the associations that the use and abuse of alcohol and illicit drugs have in relation to crime in Canada. In this work we have developed some new data collection methods and a new conceptual frame for arriving at estimates of associations. The methods and the conceptual frame used for the estimation of attributable fractions need further development in future studies. Attributing causal influences is a complex task and presupposes considerable familiarity with existing research and theories in the field. Despite such challenges, it is our opinion that our estimates are as reliable as any that can be made at the present time.

We owe a great debt of gratitude to many individuals who have been involved in various stages of the research described in this report. Jacques LeCavalier has been a driving force in both Canada and internationally for the study of the costs of alcohol and drugs to society, and he is the power source behind the coalition of funders that made our research possible. In his work on the social costs of alcohol and illicit drugs, Dr. Eric Single posed the salient questions on attributable fractions and thereby initiated the research presented in this report. Dr Single also provided valuable comments on a near-final draft of this report.

The collection, processing and analyses of the data that form the basis of this report are the product of a fruitful cooperative effort. The authors want to thank Larry Motiuk, Director General of the Research Division, Correctional Service of Canada, for providing access to the CLAI data which the CSC has collected from Canadian federal inmates for more than a decade. In addition to providing valuable data, this databank played an important role in the planning of other studies in the research program. We also extend our thanks to Professor Louis-Georges Cournoyer, Université du Québec at Hull, for his skilful analysis of the CSC data.

Harvey Skinner, professor of Psychology at the University of Toronto, has not been personally involved in our research, but his influence has nonetheless been profound. He authored the CLAI questionnaire for the CSC as well as the DAST and ADS scales measuring dependence on drugs and alcohol. All three instruments have been central in our research.

Interviews with inmates were carried out in four penal facilities. The Regional Reception Centre for federal inmates in Québec helped the research team by providing access and logistical support at the facility. Larry Motiuk in Ottawa and Ralph Serin of the Correctional Service of Canada in Kingston, Ontario were instrumental in securing access to the inmates in the Ontario part of this study. Mrs. Christine Perreault fulfilled the same important function in the Québec part of the federal inmate interviews.

The study of arrestees would not have been possible without the initiative and effort of Police Chief Barry King and Michel Pelletier of the RCMP. This is the first study of its kind in Canada. A great number of police departments and a great many individual police officers from all across Canada participated in this study. They provided a conscientious record of the arrests included in the study, and it is to be hoped that future studies will provide data of equal quality, and with an even greater number of police forces participating.

The competent and dedicated assistance of Sophie Alarie was central in the designing and testing of the new calendar instrument, and for carrying out a large portion of the interviews in Montréal. Sophie also helped in supervising the interviews both in Montréal and Kingston. Martine Barrette joined the project at a crucial stage and very quickly showed her value as a competent interviewer in the Montréal part of the study. Our two research assistants in Kingston, Lori Jo Matts and Crystal Twofoot, as well as the staff of the Reception Centre in Kingston have worked jointly to produce an excellent set of data.

In the studies of male and female inmates in provincial prisons, Martine Barrette, Melanie Desrosiers and Amélie Marsh contributed to the research through competent interviewing of inmates. The collection of data in these institutions would not have been possible without the full collaboration of Mr. Claude Nil Claveau, for Bordeaux and Aline White and Marie-Lyne Fournier, for Tanguay.

A major part of the data from the interviews is of a complicated nature with little guidance available from past research for designing computer files and for planning the data entry. A new kind of entry schedule had to be developed and it was quickly learned and applied by Veronique Noel and Katia Petit in Montréal and Lori Jo Matts and Crystal Twofoot in Kingston under the careful supervision of Martine Barette.

The share of crime that can be attributed to the use and abuse of drugs and alcohol undoubtedly differs among societies. The differences are due to variations in demographic, social and cultural factors, but are also strongly influenced by local drug and alcohol policies. The Norwegian National Institute for Alcohol and Drug Research early realized the international scientific and policy relevance of this type of research and provided travel funds for the frequent meetings of the research group as well as part of the salary for the first author of this report.

Finally, all the members of the steering committee are to be thanked for their positive and practical support and stimulating discussions.

Background

The impact of substance abuse on society is an issue of vital importance, yet very little information exists that links this impact to familiar economic indicators such as Gross Domestic Product. To address this information gap, the Canadian Centre on Substance Abuse (CCSA) held three international symposia in 1994, 1995 and 2000. In June, 1996, CCSA published the first comprehensive Canadian study of the costs of substance abuse using the international guidelines (Single *et al.*, 1996a). This study represented the first in a series of steps leading to more rigorous analyses of the cost effectiveness and cost-benefit of policy and program options.

Much progress has been made in resolving methodological issues involved in cost estimation. For example, extensive investigation of relative risks associated with substances has led to the development of attribution fractions for specific diseases in Australia (English *et al.*, 1995) and in Canada (Single *et al.*, 1996b). However, acceptable estimates have been missing on the contribution to economic costs of crimes associated with psychoactive substances. In order to fill this gap in knowledge, a research program was initiated by the Canadian Centre on Substance Abuse (CCSA). This report presents the most central findings from this research aimed at estimating associations between psychoactive substances and crime and the proportions of crime that can be attributed to alcohol and illicit drugs.

This report is divided into nine major sections. First, we will present a brief literature review of studies relevant to our theme with a discussion of some causality issues. In the second section, the aims and statistical background of the empirical research will be discussed. The methodology and findings from the three criminal populations studied will be presented in the following sections: the federal inmate studies in section 3, the provincial inmate studies in section 4, and the study of arrested individuals in section 5. The conceptual background of our measure of attributable fraction for alcohol and drugs on crime and the numerical calculations are presented in section 6. The special nature of our event-based estimates require a deeper discussion of the attributable fraction concept and its relationship to other major methods of estimation. This is done in section 7. Our estimates are mainly based on self-report data, and validity issues are therefore of prime importance. These are discussed in section 8. Finally, a brief summary of the findings and the conclusions that can be drawn from them are brought forth in the final section (section 9) of the report.

1. Brief review of the literature

As an initial part of the research program, a review of the literature was conducted on the relationships between the use and abuse of alcohol, cannabis, heroin and cocaine and crime. In particular, this literature review focused on prevalence studies, longitudinal studies and pre-post addiction studies concerned with alcohol, cannabis, heroin and cocaine use/abuse and crime. A special effort was made to find administrative and (other) unpublished reports on the topic as well as studies in progress. Researchers who specialized in this field were contacted through personal letters asking them about ongoing research and as yet unpublished findings[1].

Most of the studies treating the connections between alcohol use and crime have focused on the immediate situational influence that drinking may have on the risk of violent crime. The individual crimes looked at have been predominantly assaults and homicides, with robberies and rapes receiving much less attention.

A sizeable presence of alcohol is found in almost all studies on assaults and homicides. Canadian studies generally find lower rates than U.S. studies, with a modal value around 40-45% of perpetrators drinking, while the most representative U.S. studies report proportions of about 50-60%. The highest values are found in Scandinavian countries with shares of drinking offenders typically in the 70% to 80% range. In part these differences can be explained by how carefully the presence of alcohol is reported, but there is probably also a core of factual differences that depend, among other things, on amounts typically consumed, the types of locations where drinking occurs, the drinking company, beliefs about the effects of alcohol, to what extent drinking occasions are defined as "time out", etc. The alcohol component in the few studies reporting on rapes and robberies shows a wider range than for homicides and assaults. There are indications that alcohol use is somewhat more evenly distributed between offender and victim in these crimes. A few studies have reported on the presence of alcohol in non-violent crime events, but this is an underdeveloped area of research and it is difficult to generalize any numerical estimates. These studies are mostly based on samples of prisoners, and other sampling bases are needed. As a general observation it can be said that the alcohol involvement in non-violent crime incidents is lower than for violent crimes. However, some studies of property crimes show values of 40% or more of offenders drinking. Prison studies show that a disproportionate number of prisoners abuse alcohol in their daily lives. It is also a common finding that a substantial proportion of victims of violent crime had been drinking at the time of the incident. Analyses of coroners' reports show that victims of homicide who had been drinking were in most cases highly intoxicated.

The crime patterns with regard to illicit drugs differ from those of alcohol. It is only with regard to cocaine that one or more studies have found the same type of situational connection with assaultive crime that is so typical of alcohol. On the other hand, it is also true that a great proportion of the crimes that are committed under the influence of an illicit drug have also been preceded by alcohol consumption. Drug-related crimes are mainly acquisitive in nature. Even when a drug-dependent person is not under the influence of any

[1] The authors are indebted to Ms. Penny Parnell for her competent assistance in this initial stage of the research.

drug, the crimes he or she commits are mostly related to the use of drugs. Property crimes of all kinds, including robberies, are linked to the acquisition and use of illicit drugs. Violent crimes are part of the illegal economy structured around drug use. Longitudinal studies indicate that there is no definite causal nexus where substance abuse initiates a pattern of criminal behaviour. Criminal behaviour seems to precede drug abuse in about as many cases as drug abuse precedes criminal behaviour. However, the critical point is that drug abuse is at the very least associated with an increase in criminality of different kinds, and that periods of particularly high use coincide with the most intense criminal periods.

There is some evidence that drug effects may be confounded with pre-addiction psychiatric conditions. In such cases, this common factor may explain both the abuse of alcohol or drugs and the criminal behaviour. The association could then be spuriously attributed as being caused by the chemical abuse.

1.1 A brief review of reviews

A number of researchers in the field have conducted reviews of the literature, and their conclusions reinforce the general picture outlined above. Although research that is directly relevant to the estimation of attributable fractions on crime by alcohol and other drug use is scarce, the volume of material that discusses the joint occurrence of alcohol or other drugs and crime is overwhelming (Bennett, 1990). The following brief overview tries to condense the conclusions reached by some key reviews, summaries and criticisms of methodological shortcomings.

In the reviews undertaken in the alcohol and crime area, much of the attention has been directed at violent crime. Reviews have been written by, for instance, Pernanen (1976), Norton and Morgan (1989), Murdoch *et al.* (1990), and Collins and Messerschmidt (1993). These reviews often conclude that causality cannot be established and/or that the relationship is complex in that it involves individual, situational and socio-cultural influences. It is also of interest that Bushman and Cooper (1990) in reviewing the experimental research on aggression concluded that alcohol does, in fact, cause aggression. One reviewer, Cordilia (1985), discussed the alcohol and property crime literature and was led to conclude that the "categories of crime and alcohol use that are employed in current research are not specific enough" (p.162). This points to the difficulties that anyone attempting to assign attributable fractions even to alcohol is faced with in consulting the research literature.

Reviews in the illicit drugs field reach similar conclusions. Since the majority of reviews are from the U.S., it is no surprise that many deal exclusively with heroin. Greenberg and Adler (1974), Gandossy *et al.* (1980) and Brochu (1995), all conclude that as most heroin users have committed crimes prior to heroin use, the drug cannot be said to directly cause people to commit crimes. Gandossy and co-workers add that the need for money can, however, lead to crime. But Brochu *et al.* (1995) point out that this link depends in large part on the user (his/her previous involvement in criminality, capacity to control the level of drug use, etc.) and the context of use (e.g., price of drugs, other sources of income). Overall, these authors' assessment of the field was that "despite numerous existing studies, few if any, directly address the drug/crime nexus" (p.122). Speckart and Anglin (1986) and Nurco *et al.*

(1991), in reviewing recent advances in the field, concluded that narcotic addicts were a heterogeneous group, and that there was great individual diversity in the type, amount and severity of the crimes they committed. McGlothlin *et al.* (1978) had earlier addressed this issue while examining a sample of 690 admissions to the California Civil Addict Program. They found that 35% of the time an addiction career involved less-than-daily or no narcotic use and that during such periods self-reported criminal behaviour and arrest rates for property crimes were substantially lower.

Fattah (1971) critically reviewed the relationship between cannabis and crime, finding that most researchers agreed that cannabis did not change the personality structure, and that there was little agreement on the causal relationship between cannabis and crime. Abel (1977) examined the evidence dealing with the alleged relationship between cannabis and violence; he found the consensus to be that marijuana did not precipitate violence in the majority of those using it sporadically or chronically.

1.2 An illustration of causal complexities: Alcohol as a cause of violent crime

The logic of establishing causality is thoroughly discussed in textbooks on scientific method. However, in any science, and in the social sciences in particular, establishing the validity of causal attributions is usually a long-term process where the evidence of different types of studies addressing different parts of a causal sequence are gradually and painstakingly assembled into a (relatively) coherent whole. Ideally, replications are carried out under more or less varying conditions in order to test various explanatory models and the generalizability of findings. Thus, the case for tobacco smoking causing lung cancer is based on numerous epidemiological studies relating smoking to health problems in a great number of populations, clinical studies of smokers in treatment, studies of smokers who quit smoking, evidence from autopsies, etc. The ideal textbook study that would once and for all provide irrefutable evidence on causality is simply not possible, because data from one study can always be re-interpreted and causal roles attributed to other (often unmeasured) factors.

Probably the most powerful means of establishing causality between two phenomena is to discover the empirical processes whereby one phenomenon affects the other. A central strength of the experimental method is that it can focus in great detail on such processes, often basing the hypothesis to be tested on a statistical association found by means of epidemiological level studies. If one, in addition, is able to deduce the nature of mediating processes from widely accepted theories, one has strengthened the case for a causal connection.

In the case of several illnesses (such as liver cirrhosis), there exist well founded theories, epidemiological studies and evidence from clinical practice linking alcohol to the particular illness. The same type of situation pertains to the role of alcohol in various kinds of accidents. In the best researched areas, the microbiological mediating processes by which alcohol in the blood affects specific systems of the body and increases the risk of a specific illness or functional deficiency have been laid bare. This makes it possible to assign a causal role to alcohol with great confidence. Finding an etiologic fraction to assign to the alcohol factor is nonetheless not an easy task.

The situation regarding mediating processes is different with alcohol-related crimes and other types of behavioural outcomes linked to drinking. There is little agreement regarding the processes that determine the associations found on the epidemiological level. Even with regard to crimes of violence, which is the most thoroughly researched alcohol-linked crime area, or the even more specific area of interpersonal assaults, there is no general agreement regarding the nature of the causal processes that bring about the co-variation between alcohol and that type of crime.

Social and psychological factors are deeply implicated in most explanations of alcohol-induced crime. This differs greatly from the explanation of alcohol-related illnesses where the causal connections are predominantly chemical and physiological, and therefore dose-response modelling is a realistic possibility.

1.2.1 Causal attributions to alcohol intoxication

The substance-crime associations reported in the literature can be explained in a number of ways. Some explanations make use of theories that assume that there is a causal link between the use of a substance and the occurrence of a crime event. Such theories have received much more attention with regard to alcohol where the focus has traditionally been on acute intoxication and the role that it plays in the causal scenario leading up to a crime. The complexity of the causality issue can perhaps best be illuminated by looking at some of the key theories that have been suggested for explaining, and "explaining away", a direct causal role of alcohol intoxication in the processes that bring about violent behaviour.

Five types of theories are frequently used to explain why alcohol appears to increase the risk of excessive, "disinhibited", deviant, criminal or aggressive behaviour, and these are outlined below. It seems very likely that all the theories described below explain parts of the association and that more than one theory may in fact be applicable in explaining the same crime event.

1.2.1.1 Direct cause models

There is a common tendency to assume that a very direct causal relationship exists between drinking and criminal behaviour. Often the direct cause link between drinking and excessive, deviant and criminal behaviour is attributed to alcohol-induced "disinhibition". This presumably is a process whereby excessive and/or counter-normative behaviour occurs after drinking. It is sometimes thought to be in the nature of a neuro-physiological process in the brain, although no such specific neural process has been found (e.g., Woods and Mansfield, 1983)[2].

If a disinhibition process leading to deviant and, in some cases, criminal behaviour inevitably followed upon drinking (sufficient amounts of) alcohol, the assignment of attributable fractions to alcohol's role in criminal behaviour would be relatively easy.

[2] References to disinhibition are often only empirical generalizations that do not specify a causal mediating process (Pernanen, 1993, 1998). The disinhibition concept, in fact, has several different uses that ought to be kept separate. What is relevant in the present context is that references to "disinhibition" are often just a short form for stating that there is a direct causal link of some kind between drinking and deviant or excessive behaviours, without any causal process being defined.

Drinking would in effect be a sufficient cause for criminal behaviour to occur, and the epidemiological task would only consist of finding the proportion of crime events prior to which the perpetrator had been drinking alcohol. However, if there are in addition to this type of process other alcohol-related processes that help produce criminal behaviour, the situation is more complex.

In its simplest interpretation, the disinhibition process would mean that as long as a perpetrator had consumed any amount of alcohol, however small that amount, the crime event would be caused by alcohol and entered as a positive case in the calculation of etiologic fractions. Some studies of police reports include as alcohol-involved all crime events for which alcohol is even mentioned or where the crime occurred in a setting where alcohol was used, without trying to ascertain the level of drinking or intoxication. This is tantamount to an implicit acceptance of a strong disinhibition link. However, common observations of drinking individuals, and experimental evidence as well, indicate that the alcohol threshold for a direct cause process would have to be set higher than marginally above zero. In fact, it has been found that victims who had consumed alcohol prior to being assaulted had very high levels of alcohol in the blood. Relatively large-scale studies report mean BACs above 0.20% in victims of homicide who had consumed alcohol prior to being killed (e.g., Virkkunen, 1974; Goodman *et al.*, 1986)[3]. A question to be raised is whether the cases with BACs at the lower end ought to be considered alcohol-induced crimes even under a direct cause assumption.

There is no empirical evidence for a simple and unalterable disinhibition process caused by alcohol that would produce specific types of alcohol-related behaviour. Instead, there is overwhelming evidence that the relationship between drinking and excessive, deviant and aggressive behaviour is conditional on a number of different types of factors: (1) the situation, setting or social context in which drinking occurs, (2) several characteristics of the drinker, such as the gender, age, drinking history, (e.g., Pernanen, 1991) and also some biological factors that vary among individuals (e.g. Linnoila *et al.*, 1989; Virkkunen, 1982), (3) national and cultural differences (e.g. Lenke, 1989; MacAndrew and Edgerton, 1969; Marshall, 1983), and (4) the type of drinking itself, such as amounts of alcohol consumed, and the incidence of extended drinking bouts (binge drinking) with resulting drinking-related deficiencies in nutrition and consequently hypoglycemia and (possibly) sleep deprivation (Pernanen, 1976). Drinking habits vary among different cultures, geographical areas and population segments. Differences in the strength of the relationship between alcohol use or abuse and criminal behaviour can therefore be expected.

In consequence of the variability in behaviour after drinking, several theories of alcohol-related behaviour challenge a direct disinhibition link between alcohol and different kinds of excessive or uninhibited behaviours. Some of these theories allege that the linkage is independent of alcohol's psycho-pharmacological effects.

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[3] Very little is known about the amounts consumed by *offenders* in different crimes, even though most explanatory attempts assume that the offender's drinking is the main explanatory factor in alcohol-related homicides and assaults. The intoxication levels of victims in assaults and homicides may be expected to positively correlate with intoxication levels of their assailants, since they often have consumed alcohol together. The strength of this correlation over populations of crime events is unknown.

1.2.1.2 Conditional disinhibition theories of the alcohol-crime link

It is possible to conceive of a psycho-pharmacological disinhibition process that is contingent not solely on alcohol, but also on other factors. Several types of conditional disinhibition theories are possible and, in fact, used in explaining alcohol-related behaviour (although mostly without spelling out the contingent nature of a disinhibition process). The stimulus-bound disinhibition notions are among the simplest. These argue that, for instance, frustrating, threatening, provocative, insulting, etc. stimuli start a disinhibition process together with the psycho-pharmacological effects of alcohol. Other conditional disinhibition-type theories argue that there is something in the biological makeup of some people (almost exclusively men) that causes them to act violently after drinking (e.g., Linnoila *et al.*, 1989; Virkkunen, 1982).

What do these conditional types of disinhibition theories entail for the calculation of etiological fractions? Will it still be possible to infer etiologic fractions from pure alcohol-presence figures? If there is a biological base for disinhibition, shared only by a certain proportion of individuals who drink alcohol, one would need to know their share in the population of perpetrators of crime events, and probably assign an etiologic fraction of 1.0 to these events. The rest of the alcohol-related crimes would then either (1) be caused by other alcohol-induced causal processes, (2) alcohol in combination with other conditional factors, or (3) the crime event would only be associated with alcohol by chance.

1.2.1.3 Other conditional or combined theories

There are other more general theories of alcohol-related behaviour that treat deviant or excessive behaviour as merely special cases of general psycho-pharmacological effects of alcohol on the individual. The specific behaviours that ensue after drinking will then in this view depend on conditional factors of many different kinds.

Theories that do not try to predict the consequences of drinking on the behavioural level, as disinhibition theories do, include those that argue that the effects of alcohol on cognition have a significant causal role in determining the types of behaviour that ensue after drinking (e.g., Hull *et al.*, 1983; Pernanen, 1976; Taylor and Leonard, 1983; Steele and Josephs, 1990). The effects of alcohol on perceptual and attentional capacity are at the centre of this approach. In addition, the ability for higher-order processing of information that determines memory capacity, recognition, and definition and interpretation of occurrences, etc is affected by alcohol. These cognitive effects have been studied by experimental means. The consequences of these cognitive processes on the behavioural level have been characterized as an alcohol-induced tendency to be concerned with the here-and-now and to make cognitively simple interpretations of occurrences in the situation; characteristics that can be labelled as situationality and simplicity (Pernanen, 1993).

Alcohol's effects on social interaction are central in the etiology of interpersonal conflict and criminal violence. Introducing social interactional processes into the explanation brings in an additional level of uncertainty between the more immediate effects or accompaniments of drinking and the behaviour that results from drinking. Interactional effects can come about through a number of causal pathways. A relatively simple disinhibition process would be able to incite obnoxious, provocative, etc. behaviour in an interactional episode, and this

could escalate into physical violence. Alcohol's sensori-motor effects (on gait, speech, eye movements, facial expressions, etc.) are a giveaway sign of intoxication (which in itself sometimes suffices for negative responses by others in interactional episodes), but they also disrupt interaction through clumsy and "rude" behaviour. Through social interaction even the drinker's positive feelings (at times resulting in excessive or indiscriminate affectionate behaviour) may lead to conflict, aggression and violence, when common proprieties are not observed (Pernanen, 1981).

1.2.1.4 The alcohol-crime link as based on social constructions

Let us now look at the theories that are the total opposite of the disinhibition notion. Their proponents accept that the association between drinking and criminal behaviour is not (merely) a chance occurrence, but they argue that it is not caused by any causal processes in the drinker of a biological or neuro-psychological nature. Three theories of this type have been widely discussed, and are apparently widely accepted: (1) expectancy theories (e.g., Goldman *et al.*, 1987, 1991), (2) deviance disavowal theories (e.g., Gil, 1970), (3) "time out" theories of drinking events (MacAndrew and Edgerton, 1969).

Expectancy theories are based mainly on some interesting experimental findings. It has been shown in numerous studies that the mere belief that they have consumed alcohol (while, in fact, they have not) will induce experimental subjects to behave more aggressively (e.g., Lang *et al.*, 1975), to be more easily sexually aroused (e.g., Wilson and Niaura, 1984), to become more sociable and outgoing (Wilson and Abrams, 1977), etc. In fact, some experiments show no alcohol effects at all on these kinds of behaviour tendencies – just expectancy effects. Meta-analyses which have been conducted on the results from published studies indicate that both alcohol in the blood and the belief that one has been drinking alcohol affect behaviour (Hull and Bond, 1986), although this conclusion is not shared by all who have analyzed the experimental literature on the subject. Bushman and Cooper (1990) conclude on the basis of their analysis that there is only a beverage effect (and no expectancy effect) and that the propensity for aggressive responding increases with the level of intoxication. It should be pointed out that the beverage deception only works at low levels of drinking: after a while, subjects tend to become suspicious when their physiological sensations are not concordant with the information they have been given regarding the beverage they are consuming.

The findings from expectancy experiments have sometimes been over-stated and over-generalized. Nevertheless, one cannot rule out the possibility that expectancies pertaining to alcohol's effects on behaviour and human interaction have a significant effect on behaviour at least in the early stages of an drinking event.[4] And although expectancy effects may be

[4] An observation from one of the early Finnish experiments on the effects of different types of alcoholic beverages on group interaction is relevant in this context (personal communication by Touko Markkanen, 1970). The researchers observed that the sound of the elevator approaching the floor where the experiment was conducted, and carrying the person who brought the next round of drinks for the experimental sessions, caused a distinct change in the interaction within the groups of subjects. It became more lively, humorous and expressive. In the same way, hearing the clinking of bottles inside a shopping bag will change the mood of many passengers on public transportation at least in some Scandinavian countries, and perhaps more so when the weekend is approaching. Seeing a bottle and smelling alcohol also affects people's behaviour through expectancies and social beliefs.

overshadowed by the psycho-pharmacological effects of alcohol at higher blood alcohol concentrations, the tone and the content of the interaction in a drinking event may already have been set by expectancy effects. There is considerable evidence indicating that expectancies and expectancy-linked behaviour vary across different countries and cultures. For calculating alcohol-induced social costs, these findings raise some central conceptual questions.

Deviance disavowal theories "explain away" the association between alcohol and deviant behaviour by suggesting that alcohol is used as a means of avoiding responsibility and culpability for deviant acts committed after drinking. This theory was first suggested by Gil (1970) in explaining the association between drinking and child abuse. It is frequently used to account for the association between drinking and family violence. Feminist explanations favour this type of explanation, considering it to be the main (sometimes the only valid) explanation for drunken male violence against female partners. This way of looking at the alcohol-crime association is related to the expectancy approach in that the connection is seen as being essentially "artificial". There is, however, one important conceptual difference. While expectancy effects are treated as being independent of the drinker's free will and largely subconscious, deviance disavowal is seen mainly as a conscious and rationally planned exercise. This comes out with particular clarity when deviance disavowal is phrased as "blaming alcohol" or drinking being "used as an excuse" for deviant behaviour.

Deviance disavowal or blaming alcohol for unwanted behaviours can be used as a "second-order" theory, because the alcohol effects or other alcohol-related circumstances that are being blamed for one's actions can be based on any of the theories outlined above. That is, alcohol can be used as an excuse for committing criminal acts by invoking psycho-pharmacological properties of alcohol that "made" the person act in this manner either by releasing inhibitions or by appealing to its cognitive effects, etc. "Time out" theories or expectancy effects can also be used to justify behaviour that is against sober norms. The less the alcohol-related phenomena used for excusing behaviour are amenable to wilful control, the stronger the case for claiming lack of responsibility. "Pathological intoxication" is probably the most extreme case of alcohol-induced automatism, but it is a very rare phenomenon.

Other related theories consider drinking occasions to be *"time out"* situations where deviant behaviour is tolerated and even socially encouraged (MacAndrew and Edgerton, 1969). According to this type of explanation, it is the societal norms governing drinking occasions and not any alcohol-induced causal processes that explain deviance in connection with drinking.

The *semiotic approach* to alcohol-related deviance does not form one single coherent theory. In common with the expectancy and the deviance disavowal explanations, it stresses the importance of socially meaningful constructions in the explanation of all behaviour, including behaviour after drinking. Semiotic theories regarding the social meanings of alcohol and drinking can be invoked in, e.g., rape cases by arguing that a female victim's mere presence in a drinking establishment or her manner of drinking signalled sexual availability. This could be used as an excuse by the rapist, but it is also a semiotic explanation of his behaviour in that it invokes interpretations of the symbolism of human behaviour and its social context. In a similar way, alcohol and the act of drinking may be symbols of independence or rebellion among youth. For instance, vandalism after drinking

would reflect this definition and it may in part semiotically explain the behaviour of youthful drinkers and its links to alcohol use.

1.2.1.5 Rational use of social and psycho-pharmacological effects

There are other types of explanations of alcohol-related deviant behaviour where alcohol is clearly a component in a rational means-end scheme. One of these is the planned use of alcohol's effects (see Burns, 1980, for an instance of this among a group of young working-class men from a Boston neighbourhood). In this variant of explaining alcohol-related behaviour, alcohol's "real effects", either pharmacological consequences or expectancies or social definitions linked to alcohol, are assumed to be used in a planned and rational manner to facilitate excessive, deviant or "disinhibited" behaviour of different kinds. Theories of this kind could perhaps be labelled facilitation theories: pharmacological alcohol effects and/or beliefs and social definitions linked to alcohol use are used rationally to enable oneself to carry out some socially unwanted actions.

Drinking to "work up one's courage" is an instance of this use of alcohol. Partial tests of the idea that alcohol increases more daring behaviour, conducted through experiments that measure changes in risk-taking behaviour after drinking, generally show that alcohol increases risk-taking tendencies. In this way alcohol can be used to facilitate aggressive responding when consumed before the drinker goes "looking for a fight". The rational utilization of the consequences of drinking has often been used to explain the relatively high involvement of alcohol in property crimes. Offenders themselves often report that they use alcohol in order to steady their nerves (e.g., Cordelia, 1985; Lemert, 1967; Strug *et al.*, 1984). In this way, alcohol can naturally be used for any type of risk-taking, deviance and crime (break and enter, car theft, forgery, spouse abuse, etc).

Numerous war crimes, most recently reported from the former Yugoslavia, have been committed under the influence of alcohol. Providing troops with alcohol and other drugs that dull their senses to the dangers and the atrocities of warfare has sometimes been a deliberate policy of military commanders, both recently and in earlier periods of history. One central question for costing purposes is whether these cases can be considered true instances of crimes that are caused by alcohol. A related question is whether other substances would be used as substitutes in a society where alcohol was not available.

This brief review shows the complexities of causal attribution even in the relatively simple case of violence that occurs under alcohol intoxication. Other crimes associated with alcohol use and abuse and crimes that are associated with drug use have an even more complex etiology.

1.2.2 Causality issues in the relationship between illicit drug use and crime

There is overwhelming evidence that illicit drug use is associated with crime. This is supported by many studies that report extremely high rates of prevalence of drug use among offenders (Biron, Brochu and Desjardins, 1995; Brochu *et al.*, 1992; Brochu and Guyon, 1994; Chiles *et al.*, 1990; Correctional Service of Canada, 1990; Dembo, Williams and Schmeidler, 1992; De Witt, 1992; Forget, 1990; Harlow, 1991; Haynes, 1998; Hodgins and Côté, 1990, 1991; Inciardi, Horowitz and Pottieger, 1993; Inciardi, Lockwood and Quinlan, 1993; Lévesque, 1994; Reardon, 1993; Schneeberger and Brochu, in press; Wish, 1991;

Wish and O'Neil, 1991; Van Hoeven, Stoneburner and Rooney, 1991; U.S. Department of Justice, 1994; Wellisch, Anglin and Prendergast, 1993).

> *For a number of decades, the existence of an empirical relationship has been documented by researchers, as well as by criminal justice practitioners and drug treatment professionals (McBride and McCoy, 1993: 267).*

Many of these studies report that nearly 80% of offenders have used illicit psychoactive substances during the course of their lives; and more than 75% of them showed traces of drugs in their urine at the time of their arrest. Among prison inmates, 30% to 50% show signs of dependence to illicit drugs; and close to 30% were under the influence when they committed the crime for which they were charged. Cannabis and cocaine[5] seem to be the most popular products with American offenders, while heroin use is more common in Europe (Facy, 1991; Ingold and Ingold, 1986; Kensey and Cirba, 1989; Lauwers and Van Mol, 1995; Sueur and Rouault, 1993).

Not only does a large proportion of criminals use and abuse illicit drugs, research also shows that a large number of users or abusers of illicit drugs are involved in criminal activities (Barre, Froment and Aubusson de Cavarlay, 1994; Brochu, 1995a; Harrison and Gfroerer, 1992; McBride and Inciardi, 1990). A large proportion of North American drug addicts admitted to treatment have a lengthy criminal record (Hall, Bell and Carless, 1993; Van Stelle, Mauser and Moberg, 1994). Drug-related crimes, in this case, range in seriousness from shoplifting to homicide. Nurco and his collaborators have estimated that American heroin addicts commit more than 50 million crimes every year. Conceptualizations in estimating attributable fractions for illicit drug use on crime are complicated by the fact that by simply being in possession of an illicit psychoactive substance, users are automatically involved in a form of criminality [6].

1.2.2.1 Gainful crimes

Mieczowski (1990) estimated that crack users in Detroit spent an average of $350 a week to pay for drugs. There are extreme variations in the sums of money that users devote to drug expenses[7], but it is not surprising that a number of researchers have observed a link between the forming of a dependence and the significant increase in the number of crimes perpetrated (Anglin and Hser, 1987; Anglin and Speckart, 1988; Ball *et al.*, 1981; Chaiken and Chaiken, 1990; Deschesne, Anglin and Speckart, 1991; Hunt, 1991; Hunt, Lipton and Spunt, 1984; Jarvis and Parker, 1989; Speckart and Anglin, 1986a, 1986b). In the same way, Johnson and his collaborators (1985) indicate that 40% of the revenues of their sample of heroin users came from illegal activities. Hall, Bell and Carless (1993) reported that for 72% of the 313 Australian drug addicts in their study, the principal or the second most important source of revenue consisted in involving themselves in drug trafficking or in property crimes. Furthermore, Deschesne, Anglin and Speckart (1991) found that over a period of two years, property crimes generated very large sums of money for the 279 heroin addicts in their sample:

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5 Sometimes the order of importance is reversed.

6 We have dealt with this complication by keeping such crimes separate and classifying them in a *drug-defined crime* category.

7 A quarter of the people interrogated spent $40 weekly or less, while 8% of the subjects in the sample reported payments of over $1,000 per week.

> *While addicted, Chicanos report over $11 million in property crime income and almost $1.5 million in drug income; whites report $9 million and over $1.5 million, respectively. In comparison, employment income was only $4.6 million for Chicanos and $3.7 million for whites. (Deschesne, Anglin and Speckart, 1991: 399).*

Reuter, MacCoun and Murphy (1990) reported that some individuals can make up to $40 000 (U.S.) a year[8] from minor drug trafficking. In fact, drug trafficking, shop-lifting, breaking and entering, sometimes violent robberies – as well as prostitution for some drug addicted women – constitute gainful crimes that enable some people to obtain their drugs (Cromwell, et al., 1991; Grapendaal, Leuw and Nelen, 1995; Faupel, 1991). However, the volume of income from illegal activities will also depend on other sources of revenue available in society (Deschesne, Anglin et Speckart, 1991; Grapendaal *et al.*, 1992; Hammersley *et al.*, 1989; Johnson *et al.*, 1985; Parker, Bakx, Newcombe, 1988).

1.2.2.2 Violent crime

Statistics also associate psychoactive substance consumption with violence (Dawkins, 1997; Ellickson, Saner, McGuigan, 1997; Furlong, Casas, Corral, Chung, Bates, 1997; Howell, Decker, 1999; MacDonald, 1999; Smart, Mann, Tyson, 1997; Spunt *et al.*, 1990; Zhang, Welte, Wieczorek, 1999). In 1987, the Canadian Centre for Justice Statistics estimated that nearly 31% of the homicides committed in Canada involved suspects or victims who had been consuming alcohol or an illicit drug. One may be tempted to conclude that psychoactive substance consumption plays a key role in aggressive acts and it is indeed easy to believe that a substance with such a potent effect on the central nervous system will affect behaviour (Blum, 1981). Moreover, police reports often state that drug users were killed during a drug transaction or following a violent altercation with a dealer; other clients were robbed or shot (Harruf, 1988).

Common explanations conveyed by the mass media link violence to a state of intoxication or to the illicit drug trade while associating acquisitive criminality to the addict's yearning for money and drugs. The psycho-pharmacological explanation focuses on the relationship between intoxication and violence. According to this explanation, an individual may exhibit violent (impulsive) behaviours as a result of short- or long-term ingestion of specific drugs. Aside from alcohol, the most relevant drugs in this regard are barbiturates, cocaine, other stimulants, and phencyclidine (PCP) (Miller and Potter-Efron, 1989).

There are many ways in which drug-induced aggression may occur. The mediating factors that are most often discussed are the loss of ego-control; the deterioration of judgment; the induction of irritability and impulsiveness; the production of paranoid thoughts; and the induction of feelings of omnipotence. Such explanations amplify the processes behind the disinhibition conception (Gottheil *et al.*, 1983).

The scientific literature concerning illicit drug consumption and violence is scattered and often based on clinical accounts that focus on extreme episodes. Moreover, even though the most common general characteristics of the majority of psychoactive substances are well known, the understanding of the specific mechanisms causing violent behaviour has remained deficient. It is still not possible to pinpoint the psycho-pharmacological

[8] From which no taxes are deducted.

mechanisms explaining this relationship, which apparently occur in some people (Nurco, Hanlon and Kinlock, 1991). In fact, the research literature indicates that drug-induced psycho-pharmacological violence is uncommon (Abram and Teplin, 1990; Collins, 1990; Fagan and Chin, 1990; Miller, 1990; Wish, 1986) and cannot only be attributable to drug use:

> *The more extensive the pre-addiction delinquency, the higher the delinquency rate measure during the last 12 months of drug addiction. Violent crimes before and after drug addiction show the same correlation. Almost only drug addicts having committed violent crimes during their pre-addiction phase also developed considerable violent delinquency during the later period. (Kreuzer, 1993: 84)*

A recent literature review conducted by Roth (1994) concluded that:

> *Of all psychoactive substances, alcohol is the only one whose consumption has been shown to commonly increase aggression. After large doses of amphetamines, cocaine, LSD and PCP, certain individuals may experience violent outbursts, probably because of pre-existing psychosis. (Roth, 1994: 1)*

Moreover, the data do not indicate that pharmacological effects of barbiturates, PCP, amphetamines, cocaine or other stimulants are major factors accounting for interpersonal violence when demographic and other conditions for violence are controlled. In fact, the relationship between intoxication and violence is a lot more complex than it appears:

> *The link between violence and psychoactive substances involves broad social and economic forces, the settings in which people obtain and consume the substances, and biological processes that underlie all human behaviour. These factors interact in chains of events and may extend back from an intermediate triggering event such as an argument to long-term predisposing processes that begin in childhood. (Roth, 1994: 1)*

1.2.2.3 Factors affecting drug reactions

The difficulty in finding valid estimates of the proportions of crime that are caused by illicit drugs and alcohol derives from the complexity of the factors present and the convoluted nature of the substance-crime relationship. Among the factors, there is the type of drug (and its method of consumption), the consumer and the socio-political context surrounding the consumption of certain products.

a) The type of drug and dosage

Obviously, the analysis of the drug-crime relationship cannot overlook the effect of consuming a substance that affects the central nervous system. An hallucinogen will not have the same effect as a stimulant or depressor. Moreover, consumption of more than one type of drug either intentionally or by accident can influence the consumer's reactions to the environment. Multiple drug use is relatively common in criminal populations also in Canada (e.g., Brochu *et al.*, 1999). Since the effect of the consumption of a single drug is not always well understood, it is clear that the effects from the consumption of multiple drugs can be nearly impossible to predict with any precision (Collins, 1986).

The dosage and the method of consumption also need to be taken into consideration since the effect of the drug could vary according to these two factors (Blum, 1981; Tinklenberg and Murphy, 1972). Finally, time must be taken into account as well. The

most intense effect on the user occurs at the moment when the concentration of the drug reaches its highest level in the organism. Cocaine users often refer to this moment in terms relating to a sexual climax (Tinklenberg and Murphy, 1972).

Other time-linked factors are feared by a number of users: tolerance and withdrawal. Repeated use of certain drugs will lead consumers to increase the dosage in order to reach the sought-after effects. Tolerance could contribute to the intensification of criminal involvement on the part of users with a delinquent past, in order to raise the necessary money needed to support the increase in their consumption. In much the same way, withdrawal is feared by a number of regular users. They are afraid of this spectre and of the psychological and physical pain it generates. Some will want their fix no matter what – even if it means committing crimes. Others will manifest irritability, hostility and sometimes even truly aggressive behaviour during the periods of withdrawal, if they do not possess a sufficient amount of drugs. Then again, the manifestation of withdrawal will vary depending on the individual and the context.

b) The consumer

Individual variations in response to the absorption of a drug are well known to users. Intoxication will appear more or less rapidly depending on sex, weight, age, metabolic characteristics, as well as the user's individual hormonal responses (Gottheil *et al.*, 1983). Some people will even experience paradoxical effects. It is clear that no drug has a universal criminogenic effect; we must establish a link between the consumer and the context of use, in order to be able to anticipate accurately any kind of effect.

c) The socio-political context

Finally, in analyzing the drug-crime relationship, we must take into account the socio-political context in which the user lives. A repressive context facing the user of illicit drugs seems linked to a greater involvement in acquisitive criminality (Benson and Rasmussen, 1991; Benson *et al.*, 1992; Grapendaal, Leuw and Nelen, 1994; Hammersley, 1992; Leuw, 1995; Solars, Benson and Rasmussen, 1994). This pattern is evident from a comparison between countries that have adopted very repressive politics towards drug use such as the United States and Great Britain, with a more liberal country such as the Netherlands. However, this pattern can also be observed inside a country when punitive strategies towards users of illicit psychoactive substances are relaxed. Accordingly, a group of American economists have concluded:

> *The consequences of making drug use illegal include: (1) forcing the increase in drug prices, requiring users to acquire greater resources; (2) making steady employment difficult because of the great deal of time and effort required to find a safe source of supply; (3) making holding any job difficult because of arrests and general harassment by police; and (4) forcing drug users into the criminal subculture because laws make them criminals and force them to deal with other criminals (much as prohibition did with alcohol users) (Benson* et al.*, 1992: 680).*

The involvement of drug-dependent individuals in crime will depend on the extent to which they have other avenues open for obtaining the means to sustain their habit. For instance, in countries where social authorities are relatively generous in giving financial support even to known abusers, there will be less pressure towards gainful criminal activities. Street addicts sometimes defend their panhandling by saying that the money they make from it will lessen

their inclination to commit crimes, and social welfare may provide an "easier way out" than crime.

1.2.3 Summary

The behavioural response manifested following the consumption of a psychoactive substance will depend on the conjunction of (1) a person with (2) a drug in (3) a very specific context (Blum, 1981; Fagan, 1990; McCardle and Fishbein, 1989; Zinberg, 1984). The pharmacological effect of a psychoactive substance cannot be denied, and neither can the economic pressure exerted by a dependence, but they must be seen in relation to psycho-social factors. This complexity poses serious challenges for any attempt at estimating the proportion of crimes that are caused, totally or in part, by illicit drugs. With these sources of variation, it is to be expected that attributable fractions for illicit drugs will vary among different countries and jurisdictions, as well as within the same administrative or geographical area over time.

Violent criminality coupled with drug intoxication is a rare phenomenon, usually associated with personal past history involving violence in the absence of intoxication, or with psychopathology on the part of the user. The relative rarity of the event makes it difficult to estimate the attributable fractions with any degree of certainty. The most economical way in such a situation is to sample violent events and examine their association with various types of drugs. The drawback is that there are no cases in such a material that did not lead to a violent crime, and therefore one cannot compare the risk for drug versus non-drug cases to be involved in violent crimes. This affects the range of methods that will enable estimations of attributable fractions. The psycho-pharmacological model is nevertheless important, especially in connection with alcohol intoxication, and it has to be taken into account in selecting methods for the estimation of attributable fractions.

More frequently than being determined by intoxication, drug-related violent criminality seems to stem from social and economical factors, including the drug distribution and supply system. Violence constitutes an effective management strategy in an illicit market. Estimation of attributable fractions is complicated because people in this environment rarely report their victimizations.

This problem is more acute in studies of violence victims in the field, and our experience is that reports of perpetrators in the "secluded" situation of a prison are not subject to the same kind of bias.

As we have seen, acquisitive crimes, or more generally, gainful crimes are often at the top of the list among abusers of illicit drugs. One study estimated that between 15% and 25% of illicit drug users were involved in this type of criminality (Benson *et al.*, 1992; Kim *et al.*, 1994). If we limit our denominator to drug addicts, this proportion is nearly 50% (Grapendaal, Leuw and Nelen, 1995)[9]. However, it seems that the majority of these users were involved in crime before their addiction began, and that drug addiction only

[9] In much the same way, some studies estimate that the proportion of prisoners who committed crimes to get drugs ranges between 13% and 17% (Hammersley, 1992; U.S. Department of Justice, 1994). However, the validity of these self reports can be questioned because it is socially and often legally more favourable to be defined as a "drug addict" rather than a "criminal" (Brochu and Lévesque, 1990).

accentuated their criminal activity. The data presented in this report do not allow us to examine such career influences.

Drug policies regarding some psychoactive substances and general social policies generate a significant part of the criminality of drug addicts. Drug policies and legislation related to drugs differ among countries and create major differences in crime rates simply by differences in the extent to which drug-related activities are monitored and prosecuted. This is taken into account in our attribution modelling by treating separately the events that are labelled criminal only by virtue of being drug-related (such as possession and trafficking).

The study of the relationship between illicit drugs and crime is at times both irrational, ideologically charged and highly emotional in tone. The very words "drug" and "crime" are laden with ideological and emotional content (Barre, Froment and Aubusson de Cavarlay, 1994; Lallemand, 1995). Illicit drugs are perceived as negative elements in our society, almost diabolical in nature, the anti-worth symbol par excellence (Lallemand, 1995). It is therefore not surprising also from this point of view that these drugs are associated with criminality. A better understanding of such links between drugs and crime is also essential for arriving at valid estimates of the social costs of crimes related to drugs.

1.3 Approaches in the estimation of attributable fractions

In estimating the social costs of alcohol and illicit drugs, it is customary to conceptualize a state of society where psychoactive drugs do not exist – a counterfactual scenario. In this counterfactual state of society, none of the determinative processes outlined above for alcohol-related and drug-related violent or gainful crimes would exist for the simple reason that there would be no alcohol or drugs in society. If one takes the idea of this counterfactual scenario to its logical conclusion, all the determinative processes discussed above are relevant to calculating the proportion of violent crime that is, in one way or another, caused by psychoactive substances being present in society. They should, therefore, be taken into account in estimating attributable fractions on crime. However, we have very few clues as to how an alcohol- and/or drug-free society would differ from its previous state; we cannot directly measure the difference between the present state of a society and the substance-free version (although so-called natural experiments sometimes provide very rough approximations, e.g., when the availability of alcohol is drastically reduced due to a strike).

There are other available approximation methods which also provide rough estimates of the net effects that the existence of alcohol or drugs have on criminal behaviour. Multivariate statistical methods have been used in time-series analyses of published statistical series to study the relationship between alcohol use and violent crime (Lenke, 1989; Norström, 1993, 1996). Other examples are cohort studies of the relationship between problem drinking symptoms and rate of violent crime and property crime (Fergusson and Horwood, 2000). For such studies we either need ready-made statistical series (which exist for alcohol but not for drugs) or we need to conduct general population studies, which can relate drug consumption (or drug problems) among the population to the risk of committing crimes.

There is another way of structuring this conceptual field: with a starting point in individual crime events. This approach gets added significance from the fact that information on such events are relatively easy to get. A difficulty with event-based studies is that we have to deal directly with the concept of cause and apply it to individual crime events to see if they were

caused by drug or alcohol use. We have to face difficult questions regarding how causal relationships should be defined, and how they can be inferred using available theories. Sometimes the mere situational association, such as the lawbreaker having been under the influence of alcohol, has been used as a sufficient criterion for inferring that alcohol caused the offender to commit the crime. However, in the words of Single *et al.* (1996a: 34), "data about the proportion of offenders that were intoxicated with alcohol or drugs when they committed a crime are only data about association, and provide circumspect information about causation". Simply relying on the coincidence in time of alcohol or drug intoxication and the commission of crime over-estimates the causal contribution of the substance.

In an attempt at applying a stricter definition of "cause" in the determination of human behaviour than one based on sheer association, it is sometimes decided that when the behaviour is an expression of free will, i.e., when the individual had a free choice, there is no justification for calling the association with drugs of alcohol a causal relationship. Only the cases where alcohol or drugs caused the individual to *involuntarily* commit a crime would be positive cases in calculating attributable fractions. In the case of (1) acute intoxication, only the cases where the psycho-pharmacological effects determined the criminal behaviour would count as truly having being caused by the substance. Such cases are often gathered under the label of drug or alcohol-induced "disinhibition". In the case of the (2) long-term effects of drug use or alcohol use, the compulsive aspect is usually defined as arising from addiction to a psychoactive substance.

With the knowledge and the methods available at the present time what can be said is that the true estimates of attributable fractions are probably somewhere between the extremes that can be calculated from a conceptualization based on an inclusive counterfactual scenario and a definition of causality that would exclude the exercise of free will. In this report we have tried to apply a fairly strict criterion of compulsion or lack of free will for one's actions and have stayed away from the substance-free society conceptualization. In our later work we hope to be able to test the assumptions behind various ways of arriving at attributable fraction estimates by applying different conceptualizations of how criminal events are determined by the use of drugs and alcohol.

2. Aims of the research program

The aims of the research were specified in the proposal "Attributable fractions for alcohol and other drugs in relation to crime in Canada" by Serge Brochu and Kai Pernanen, submitted to the Canadian Centre on Substance Abuse in October, 1997 (Brochu and Pernanen, 1997). As stated in the proposal, the overall aim was "to estimate the proportion of crime that is attributable to alcohol, cannabis, heroin and cocaine". This general aim was broken down into eight **specific aims**:

(1) to estimate the proportion of Canadian federal inmates who are addicted to alcohol or illicit drugs;

(2) to estimate the proportion of Canadian federal inmates, who are alcohol or illicit drug users;

(3) to estimate the proportion of Canadian arrestees and federal inmates, who were under the influence of alcohol or illicit drugs while perpetrating their crime;

(4) to estimate the proportion of crime episodes committed by alcohol and illicit drug users under the influence;

(5) to estimate the proportion of crime episodes committed by alcohol and illicit drug (a) users and (b) abusers in order to buy their drug;

(6) to estimate the proportion of crime episodes committed by alcohol and illicit drug (a) users and (b) abusers in relation to the illegal drug market;

(7) to estimate the proportion of alcohol and drug addicts involved in crime by type of crime;

(8) to assess, on the basis of the above data, to what extent alcohol and illicit drugs can be considered as factors leading to crime.

General strategy for meeting the aims

The research program attempts to chart the relationship between psychoactive substance use and crime in three main populations of criminals and crime events: male federal inmates, male provincial inmates and individuals arrested for a crime. In the provincial study, funding was also received for a study of a sample of female inmates, and the arrestee study contains a sufficient number of women for central analyses. Due to the small sample sizes, the studies on provincial inmates only provide tentative estimates. They will hopefully serve in part as pilots for more ambitious future studies. The projects, and especially the ones using the three-year calendar instrument (see below), confronted the researchers with several new challenges: New methods were used, new topics were covered and novel solutions had to be found in the processing and analysis of some of the data.

As is the case with all empirical studies that collect new data for the purpose of making population estimates, economic considerations guided the choice of samples and methods. An extensive literature search provided very little ready-made information relevant to estimating associations and attributable fractions for Canada. High priority was therefore given to locating available databanks that could be used in the study already in the initial stages of the project. Only one such file was found, the CLAI file of the Correctional Service of Canada (described below), but it proved very valuable for the aims of the study.

In theory, large general population studies would provide a way of arriving at estimates of how much different factors, such as drug dependence or level of drug use, contribute to variations in criminal activity among individuals. The great advantage of studies that include individuals who may or may not have used drugs and who may or may not have committed crimes is that having or not having committed a crime can be used as a dependent variable for various levels of drug use (including alcohol). In this way it is possible to determine how the likelihood of criminal activity is related to various levels of psychoactive substance use. However, in addition to the validity problems linked to self-report studies in sensitive areas of behaviour (especially in general populations), the sample sizes needed for obtaining a sufficient number of individuals who had used drugs and who had committed crimes, serious crimes in particular, would make for very high costs. In studies of prison inmates or arrested individuals this problem does not exist because they have by definition committed one or more crimes (or, in the case of arrestees, are at least suspected of having done so). Similarly, in studies of drug addicts, the selection has been limited to individuals who, in fact, all abuse drugs.

The advantages of studying samples of drug addicts or criminals for the purpose of establishing attributable fractions come at the cost of limiting the types of analyses that can be performed. The limitations can best be overcome by introducing causal models that apply to individual cases, i.e., "can *this crime event* be said to be caused by drugs or alcohol under the assumptions that we make about how crimes are caused by drugs or alcohol?" Several important questions on the relationships between the use and abuse of psychoactive substances and criminal behaviour can be addressed with this type of data. This will be done in this report with the help of the data from the different projects included in our research.

The aims stated in the research proposal speak mainly of federal inmates. The CSC study and the later interviews with samples of federal inmates contain the greatest number of cases, and they are therefore best suited for detailed prevalence analyses. The CSC data also provide the best geographical coverage of Canadian offenders. The later extensions of the research program make it possible to report on the extent of use and abuse in two additional criminal populations: provincial inmates and arrestees. It should be noted that because of the special nature of the data collection, the information on arrested individuals, although an important element in the overall picture, is not strictly comparable to the other populations. In the context of the other studies, it nevertheless provides valuable contributions to our knowledge of how Canadian criminality is associated with the use and abuse of alcohol and drugs.

Since we lack recourse to independent confirmation of validity of our findings and estimates, we will put most emphasis on the following criterion of reliability and validity:

> *If there is rough agreement in estimates from the different studies, we can feel more confident that our estimates can be used as estimates of attributable fractions generally applicable to crime in Canada.*

2.1 Various stages of detection and legal processing of crimes and criminals

Estimates were sought from three different populations of criminals and crime events: (1) inmates in federal penitentiaries, (2) inmates in provincial prisons, and (3) individuals arrested for a crime. The first two groups make up the bulk of known adult perpetrators of relatively serious crimes committed in Canada. Arrestees and their crimes, on the other hand, better reflect the true characteristics of criminal activity in the country, including a greater proportion of less serious crimes and the individuals who commit them.

In theory, it would be possible to sample other populations of criminals and crime events for the study of the links between alcohol or drug use and crime. Figure 2.1 shows the main junctures at which criminal events and criminals are subjected to various social dispositions. These junctures can be used for sampling and study. For instance, numerous studies of police reports and court documents have been carried out in many countries. Some of these have looked at the role of psychoactive substances in the commission of various types of crimes. Official documents are, however, not well suited for quantitative estimation. Much relevant information is typically missing, including data on the use and abuse of psychoactive substances. It is preferable to collect new information, and this can only be provided by individuals who have direct information on the crime event. In the case of crimes that have a victim, so-called victimization studies ask the victim about the crime event, the characteristics of the victims themselves, and, when known, characteristics of the perpetrator. Perpetrators are sometimes also interviewed about their personal characteristics, behaviour patterns (including the use of psychoactive substances), and particulars about their criminality and some specific crime events.

It is useful to think of the crimes committed in a geographical region or jurisdiction as being a well defined set of events, and of the set of individuals who committed the crimes in the same time period as similarly well defined. In practice, there is considerable uncertainty about what constitutes a criminal event in the eyes of the law. This comes out almost every day in the cases that are processed in Canadian courts. Not infrequently, a case is thrown out of court either because it cannot be proven that a criminal act was committed or even if it was potentially a criminal act, the perpetrator lacked the intent necessary for it to be labelled a crime. In other cases, there are disagreements as to the correct, or most suitable, label for the act in question. We shall nevertheless proceed under the assumption that we are dealing with well defined sets of crime events and criminals in all our study samples.

Canadian statistical data deal alternately with (a) crime events and (b) perpetrators of crimes. In order to clarify the nature of our studies and estimates, it is probably useful to describe the “flow” of criminals and crime events from the commission of crimes to their final legal resolution. This has been done in Figure 2.1. The further down we get in the flowchart the better defined the crime events are, especially after they have gone through the scrutiny of the courts. A great proportion of incidents that are reported to the police would probably not pass a court test and in that sense do not deserve to be labelled as crimes, whereas the ones that have been processed in court and punished with a prison sentence would contain a much smaller share of doubtful cases. Potential crime events that are accessed through interviews in the general population probably contain more questionable crime events than any other widely used source.

Attributable fractions can apply to specific sets of both (a) events or (b) individuals. In the study of public health and epidemiology, one individual can be represented by a great number of illness events. The choice is between studying the individual who suffers from (or is prone) to the disease or studying the separate illness events; in many cases the decision is to study the combination of the two. This choice also exists between crime events and criminals. Studies of criminals and studies of crime events both provide valuable information on the causes of criminal behaviour. In some cases we only have information on the crime event. This is the case for the crime incidents that are reported to, or independently detected by, the police. Data on these events often lack information on suspects or perpetrators. In other cases, the individual is the unit of information, such as in data on prison inmates. One and the same individual will often have committed a great number of crime events (which is starkly evident from some of the findings below). In our analyses we shall use characteristics of both individuals and events in constructing our estimates of attributable fractions.

These remarks and the discussion to follow may seem unnecessarily detailed and technical. However, they are necessary as a background for understanding the types of generalizations that can be made on the basis of our data and the crimes and criminals that our estimates can be said to apply to. As well, they are useful for grasping the nature of the attributable fractions that we can estimate with our data.

2.1.1 Crimes committed

The most general set of crime events in Canada are all the crime events that were committed in a specific reference period such as during a calendar year (see the top of Figure 1). This is, for obvious reasons, an unknown quantity. Some methods have been developed for estimating this number, although the criteria used for labelling an event as a crime are rather loose and many of the cases would probably not stand up in court.

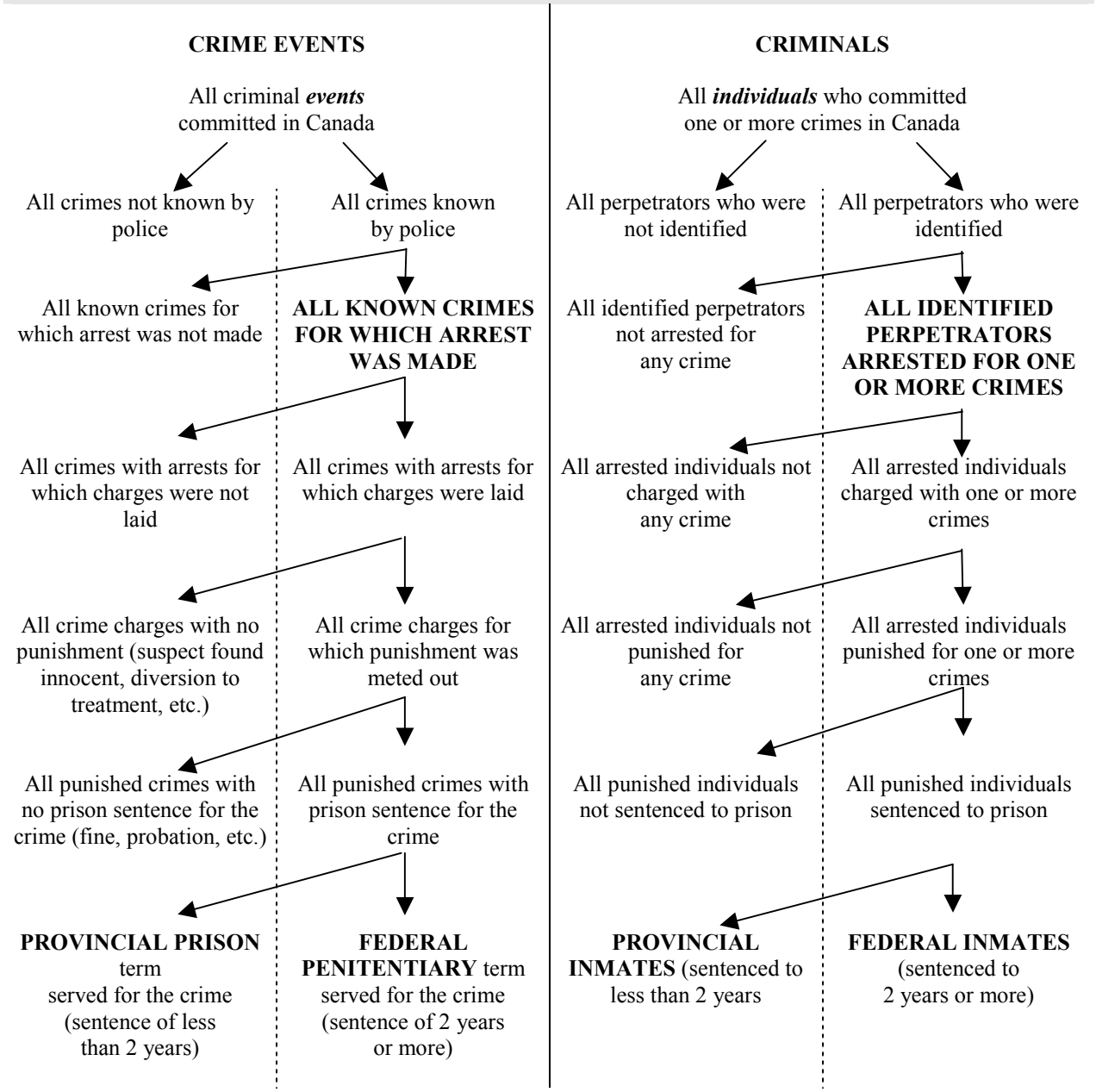
Due to the difficulties of defining crimes and finding reliable methods for measuring crime, no official statistics exist of the totality of crime committed in Canada or any other country, although some methods have been developed that attempt to find estimates. These methods attempt to arrive at tentative estimates of the total volume of crime and the size of the so-called dark figure. This figure represents the percentage of crimes not known to the authorities out of all crimes committed.

A central question for our purposes is whether we should strive to make estimates pertaining to the total set of crime events that occur in Canada, and to estimate the proportion of all committed crimes that can be attributed to the use and abuse of alcohol and illicit drugs. The answer to this question naturally depends on the purpose for which we want to obtain attributable fraction estimates.

If we wish to make estimates of association or causal attribution that pertain to all crime occurrences in Canada, such as the proportion of crime associated with the use and abuse of psychoactive substances, the dark figure should be taken into account. The most widely used method for arriving at the total volume of crime is by asking general population samples about the victimizations that they have experienced in, for instance, the preceding 12 months. This method will obviously not detect so-called victimless crimes such as drug possession and prostitution.

Another relatively successful method is to ask the general population or known criminals or substance abusers about the crimes that they have committed during a certain time period. This approach has been used with provincial and federal prisoners in our research program. What we ideally get in our interview studies are total censuses of the crimes committed by heavily criminalized populations.

FIGURE 2.1
CHART DEPICTING RELATIONSHIPS BETWEEN DIFFERENT UNIVERSES/POPULATIONS OF CRIMES



2.1.2 Crimes reported

The next possible level for study are the crime events that came to the attention of the police. Statistics on the reported numbers of various types of crimes are published annually by Statistics Canada. Table 2.1 shows that between approximately 2.6 and 3.3 million crimes came to the attention of the police annually between 1993 and 1999. (Considering the dark figure, this means that the number of committed crimes must be several million). The majority of these crimes do not have a known offender.

TABLE 2.1 NUMBERS OF CRIMES THAT CAME TO THE ATTENTION OF THE POLICE, AND INDIVIDUALS CHARGED FOR CRIMINAL CODE OFFENCES IN CANADA DURING THE PERIOD 1993-1999

	Year						
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Reported to police	3,279,292	2,919,557	2,921,188	2,882,424	2,787,409	2,701,691	2,613,348
Charged							
Adults	666,584	575,226	550,977	538,164	509,500	507,355	513,150
- males	556,529	484,943	463,338	452,281	426,600	424,021	429,239
- females	110,055	90,283	87,639	85,883	82,900	83,334	83,911
Youth	150,696	127,199	128,769	126,823	121,122	117,036	109,474
-males	119,206	101,675	101,385	99,258	94,042	90,721	84,484
-females	31,490	25,524	27,384	27,565	27,080	26,315	24,990

Source: Statistics Canada, Cat. 85-205.

2.1.3 Arrested individuals

There are, somewhat surprisingly, no statistics available on the volume of arrests made annually in Canada. Neither is much known about drug and alcohol use among arrested individuals in Canada from sampling studies.[10]

Crimes that have come to the attention of the police are considered to be the least biased source available for crimes committed. Many of these crimes, however, do not have a known perpetrator. We probably find the least biased samples of *offenders* among the individuals who have been arrested for a crime.

[10] It is to be hoped that the arrestee study in our research program will help fill some of the gaps, and perhaps give some impetus for more ambitious research on the use and abuse of alcohol and drugs among individuals arrested for a crime. The Arrestee Drug Abuse Monitoring (ADAM) program conducts drug testing on arrestees at 35 U.S. urban sites. Between 1990 and 1998 it had tested about 180,000 male and 70,000 female arrestees (Source: National Institute of Justice. 1998 Annual Report on Opiate Use Among Arrestees. Washington, DC.). The most frequently encountered drug was cocaine (42.0%), with cannabis second (27.2%) and opiates third (8.5%). Poly-drug use was very common.

2.1.4 Individuals charged

Information is available on the total number of *charges laid* in the different courts of Canada. Table 2.1 shows this information for Criminal Code offences for adult men and women and for youth under the age of 18.

2.1.5 Convicted individuals

Convictions by the courts of the country satisfy the most stringent criteria for a true criminal offence. We may be in doubt regarding the true criminal nature of many of the (alleged) acts reported in victimization surveys and other studies, or the events that come to the attention of the police, and we may even question the criminal status of the arrested individual and his or her acts, but society has no more widely accepted definition of a crime than the judgment handed down by a court. In our studies of federal and provincial inmates we are therefore on relatively solid ground as to the legal status of the criminal events in our samples.

2.1.6 Imprisoned individuals

The prison inmates and the statistics based on these individuals are the results of all the selection processes concerning individuals that started with the commission of the crime. These inmates are also "repositories" of crime events from any of the levels described in Figure 2.1. In the great majority of cases they have committed other crimes in addition to the crimes for which they have been sentenced, many of their crimes have been reported, they have usually been identified as perpetrators and arrested for more than the present crimes, they have been charged with one or more crimes, and they have been punished with one or more prison sentences. We would expect to find them represented in all the flowchart junctures shown in Figure 2.1.

TABLE 2.2 NUMBER OF INDIVIDUALS IN CUSTODY ON ANY GIVEN DAY AND NEW ADMISSIONS DURING THE YEAR IN CANADIAN FEDERAL AND PROVINCIAL PRISONS IN THE PERIOD 1993-1999

	1993	1994	1995	1996	1997	1998	1999
Federal inmates							
- on any given day*	13,322	13,818	14,076	14,197	13,765	13,178	12,974
- annual admissions	5,084	4,758	4,401	4,569	4,250	4,489	4,221
Provincial inmates							
- on any give day**	19,481	19,521	19,427	19,526	18,955	19,233	18,651
- annual admissions	119,789	117,938	114,562	107,997	98,628	93,045	84,869

* This estimate is based on the number of inmates in custody on March 31 of each year.
** This estimate is the mean daily number of inmates in all provincial prisons in Canada.

Very few prison inmates have committed only the crimes for which they were sentenced to prison. They are, for instance, relatively likely to have committed and been arrested as suspects in other crimes. They are therefore "multiply relevant" on the event-level (the left

column in Figure 2.1) in the study of the connections between alcohol, drugs and crime. Just how relevant will become evident in sections 3 and 4 of this report.

2.2 Crime patterns of provincial and federal male and female inmates

The crime patterns of provincial and federal inmates differ, and it is therefore important to get information on both populations. Little is known about possible difference between these incarcerated populations with regard to substance use, and this by itself is enough justification for a separate focus on the two populations.

2.2.1 Provincial prisoners

Individuals who have received a prison sentence of *less than two years* serve their time in provincial prisons. The mean length of stay in provincial prisons is only about one month. The figures in Table 2.2 show that there are less than 50% more provincial prisoners than federal prisoners in custody on any given day. However, because their time of incarceration is much shorter, the number of individuals who were admitted in 1999 was close to 85,000 i.e., about 20 times greater than the number of federal inmates.

2.2.2 Federal prisoners

Federal penitentiaries in Canada admit inmates who have been sentenced to incarceration for *a minimum of two years*. Federal inmates have therefore generally committed more serious crimes than those in other criminal populations. The mean length of stay in federal penitentiaries is 3 years and 10 months. There were 12,974 inmates in federal custody on any given day in 1999.[11]

2.2.3 Males and females in the different junctures

Some of our data allow separate estimates for men and women. It is therefore of interest to look at the relative proportions of men and women in the available statistics. In the period between 1993 and 1999, the share of females among the adult individuals charged with a Criminal Code offence varied between 15.7 and 16.5 per cent. Among youth this range was 20.1 to 22.5 per cent. The only other statistical information available on male-female ratios is the proportion of inmates in provincial and federal prisons. This share was about 9% in the provincial prisons and 3% in the federal penitentiaries (source: Statistics Canada, Cat. 85-211-XPB, 1993 and 1995).

Attempts have been made to obtain research data on female inmates in federal penitentiaries. To date, these attempts have not been successful, and data on female inmates are available only from the Québec prison for women at Tanguay. In the third type of study in our research program, the arrestee study, the share of women is 17.8% (334 cases out of 1,878). As was mentioned above, no statistical data exist for arrests in Canada. However, our share of female arrestees is relatively close to the share of women who were *charged* with a Criminal Code offence in 1999 (16.4%).

[11] The mean annual cost of keeping a male inmate in a federal penitentiary was $59,661 in 1998-1999 (Source: Correctional Service of Canada, Basic facts about federal corrections, 2000).

Is it possible to generalize to populations of crimes and criminals from our inmate and arrestee sample? From the numbers shown in Tables 2.1 and 2.2 it is clear that the numbers of crime events and perpetrators of crimes differ greatly between the different levels of commission and processing. We have no reliable information on the number of crimes *committed* in Canada, but we can safely guess that there are several million. In many of these cases there are no specific victims who would report the crime to the authorities. Trying to get estimates of the substance involvement in this complete set of criminal acts may be an important scientific priority. It is not clear that this would be a high priority in the calculation of attributable fractions aimed at estimating the social costs of alcohol and drug-related crime.

It is generally agreed that the closest we can get to estimates of the actual level and characteristics of criminal behaviour in a population is by studying samples of crimes that were *reported* to the authorities. With a probability sample of such crime events and their perpetrators in Canada we would be able to generalize to a population of over 2.5 million events (and to a considerably smaller number of perpetrators).

> *One true figure? We need to specify the population of crimes and criminals that would be most relevant for estimating the social costs attributable to the use and abuse of illicit drugs and alcohol. One of the decisions would concern the relevance of undetected and unreported crimes for such attributable fractions. Can they be totally ignored? This is a thorny conceptual question, which can only be answered by those who will use the attributable fractions for costing purposes.*

It may be a legitimate scientific goal to seek a *true figure* for the share of all committed crimes that are attributable to drugs or alcohol use (or any other factors) in Canada. This may, however, be unattainable in practice and not needed for some of the costing purposes. The impact of unrecorded crimes on the share of crimes attributable to illicit drug or alcohol is unknown. If this share can be assumed to be roughly the same as for recorded crimes we need not concern ourselves with the unrecorded crimes. This, in effect, is the "default option" used in this report.

Weighting by seriousness. All crimes are not considered to be equally serious, as is evident from the wide range of sanctions that apply to different types of crimes. It would seem that weighting procedures are needed in the calculation of attributable fractions in order to avoid equating, for instance, shoplifting with murder. The choice of criteria for weighting heavily depends on the purpose of the estimation exercise. Seriousness or prevention priority would be rather generally accepted criteria for weighting.

Attributable fractions can be designed so that they reflect seriousness of crimes. Homicide cases would receive a much higher weight than, for example, drug possession cases. The psychoactive substances that are associated with more serious crimes would then receive higher attributable fractions than substances associated with lesser crimes. Part of the crime events and criminals that we have accessed through our samples of inmates are, rather unsystematically and unscientifically, weighted as to the seriousness of the crimes (by consisting of the crimes for which the inmate received the longest sentence). Individuals who have been sentenced to incarceration and many of the crimes they have committed probably rank higher in seriousness and as signs of criminal proclivity than any other categories shown in Figure 2.1.

This discussion has been meant to clarify somewhat the inter-relationships among the types of samples that we have, and the populations of crimes and criminals to which we can possibly generalize our various estimates. Is it possible to arrive at one general estimate? We will see in our data. The degree of agreement among the different studies in general patterns of association will give us a rough indication of this possibility. If substantial agreement is found, it will strengthen confidence in the range of the estimates.

3. Studies among federal inmates

3.1 Methodology

In a simple random sampling of crime events, we would randomly select them from a listing of all crimes committed or reported or for which an arrest was made, etc. This would be done independently of *who* committed the crime; that is, without first sampling individuals and then the crimes that they have committed. However, the sampling units in our inmate studies are individuals. With the individual as the "base" we include crimes that he or she has committed.[12] Compared to a direct sample of crime events, as in a study of police reports, it complicates the drawing of conclusions. On the other hand, for our method of estimating attributable fractions we need to know whether the perpetrator was dependent on alcohol or drugs and therefore a simple listing of crime events would not suffice.

The crime events in our two-stage sampling among inmates are heavily biased towards serious crimes. The definition of the crime, having gone through the filtering process shown in Figure 2.1, is probably better than at any of the other stages of social processing shown in the figure.

The two studies among federal inmates represent different geographical areas; one of them provides data for all of Canada and the other only for the provinces/regions of Ontario and Quebec:

(1) The Computerized Lifestyle Assessment Instrument (CLAI) data were made available by the Correctional Service of Canada (CSC). They contain information on new admissions to all Canadian federal penitentiaries. This study will be referred to as ***the CSC study***.

(2) Interviews with 477 male inmates were carried out at the federal reception centres in Québec and Ontario. This will be referred to as the Federal Inmate Interviews or ***the FII study***. It was specifically conducted for the estimations on this project.

For the provinces of Québec and Ontario the two studies complement each other by using different data collection methods on the same population, thereby supporting alternative estimation methods. If the alternative estimates are within a tolerable range, confidence in their robustness is strengthened.

3.1.1 The Correctional Service Study (CSC)

3.1.1.1 The Computerized Lifestyle Assessment Instrument (CLAI)

The Computerized Lifestyle Assessment Instrument is both a diagnostic tool and a survey instrument used by the Correctional Service of Canada. It is administered to all new federal inmates at admission to an assessment centre prior to their being sent to an institution.

[12] In the language of sampling statistics, the sample of criminal events in our inmate studies is based on two-stage sampling with the individual inmate being chosen in the first stage and the inmate's criminal event(s) forming the second stage.

The CLAI helps in taking into account treatment and other individual needs of the inmate. It contains questions on several areas of life. Detailed questions on the inmate's alcohol and drug use and criminal activities are included in the instrument.[13] This makes the databank suitable for several key purposes of the present study.

The Correctional Service started the data collection on the CLAI in 1989. Over the years an increasing number of penitentiaries have contributed information to the computer file. In the file to which we have access there is information on close to 17,000 inmates. The best geographical coverage is for the 1993-1995 period, and this has been selected for our analyses (N=8 598). The differences between the total file, which includes data from between 1989 and 1997, and this sub-file are generally negligible (Brochu et al., 1999).

The data are collected by means of a computer-driven questionnaire: the inmates enter responses to questions which appear on a computer screen. It takes on average about two hours to answer the questions.

TABLE 3.1 MAIN CONTENT AREAS OF THE COMPUTERIZED LIFESTYLE ASSESSMENT INSTRUMENT (CLAI) QUESTIONNAIRE

Health	**Relationships**	**Drug use**	**Alcohol use**	**Criminal activities**
Nutrition	Spouse	Initiation	Initiation	Initiation
Physical activity	Family	Lifetime use	Lifetime use	Lifetime crimes
Smoking	Friends	Overall impact on various life areas	Overall impact on various life areas	Drug and alcohol impact on crimes
Sleeping habits	Community	Patterns before age 18	Patterns before age 18	Number of crimes on current sentence
Physical health		Patterns 6 months before arrest	Patterns 6 months before arrest	Most serious crime on current sentence
Mental health		Patterns 28 days before arrest	Patterns 28 days before arrest	
		Drug dependence: DAST scale	Alcohol dependence: ADS scale	
		Treatment needs and history	Treatment needs and history	

Robinson, Porporino and Milson (1991) conducted reliability and validity assessments of some components of the CLAI on a sample of 503 inmates and concluded that this instrument has good psychometric properties and high agreement with information from the inmate files.

3.1.1.2 Dependence scales

Two widely used psychological scales, the Alcohol Dependency Scale (ADS) and the Drug Addiction Severity Test (DAST), are included in the CLAI instrument. They are used for determining whether an inmate is dependent on alcohol or drugs. In our research program,

[13] The CLAI questionnaire was designed by Professor Harvey Skinner of the University of Toronto who also created the two widely used dependence scales, ADS and DAST. These were used in the CLAI and in all our interview studies with federal and provincial inmates.

these instruments were used in all the interview studies with the federal and provincial inmates.

3.1.1.3 Representativeness

The CSC census draws its population from all five regions of the Correctional Service in Canada (the Atlantic, Québec, Ontario, Prairie and Pacific regions). Table 3.2 shows the official statistics over new admissions in the period 1993-1999 which covers the data collection of the two studies of federal inmates (1993-95 and 1999, with only a few interviews conducted in 2000).

TABLE 3.2 NUMBERS OF INMATES ADMITTED TO FEDERAL PENITENTIARIES IN 1993-1999 BY REGION

	Year						
Region	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Atlantic	1,305	1,106	883	872	712	826	880
Québec	2,745	2,575	2,302	2,315	1,988	2,042	1,776
Ontario	2,267	2,147	1,839	1,941	1,610	1,566	1,558
Prairie	2,430	2,268	1,969	2,093	1,996	2,194	2,167
Pacific	1,187	983	856	875	869	787	771
CANADA	9,934	9,079	7,850	8,096	7,175	7,415	7,152

The official statistics on admissions can be used to test the representativeness of our sample of federal inmates in the CSC study. However, not all newly admitted inmates in federal penitentiaries are required to complete the CLAI form, and the numbers in Table 3.2 are therefore not suitable for the purpose. Only those with a new *warrant of committal* are required to do so. The remainder – for instance, inmates who had broken parole and were readmitted – had already filled in the questionnaire and were not asked to do so again.

Table 3.3 shows the distribution of those inmates who were eligible for completing the CLAI instrument. While the total of new federal admissions for 1993-95 was 26,863 (calculated from Table 3.2), the inmates who were eligible for completing the CLAI instrument was 14,263 (calculated from Table 3.3 and shown in Table 3.4).

TABLE 3.3 NUMBERS OF FEDERAL INMATES WHO WERE ADMITTED ON THE BASIS OF A NEW WARRANT OF COMMITTAL IN 1993-1999 (AND WERE THEREFORE ELIGIBLE TO COMPLETE THE CLAI INSTRUMENT)

	Year						
Region	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Atlantic	642	608	528	478	403	384	422
Québec	1,383	1,314	1,187	1,166	999	1,166	945
Ontario	1,350	1,210	1,068	1,186	1,167	1,131	1,071
Prairie	1,254	1,211	1,227	1,301	1,243	1,370	1,338
Pacific	475	415	391	438	438	438	445
CANADA	5,104	4,758	4,401	4,569	4,250	4,489	4,221

3.1.1.4 Weighting for underrepresented regions in the CSC study

In Table 3.4 are shown the numbers of inmates in our CLAI study file from the five regions of the Correctional Service of Canada. It is evident that the coverage varies greatly among the regions. Correction factors were therefore used in calculating the all-Canada estimates presented in this report. The weighted N is 12,404 after this procedure, but the true basis for calculating statistical error terms would naturally be the unweighted total, i.e., 8,598. The unweighted figure will consistently be shown in the tables.

The FII study was conducted in Québec and Ontario only, and it is not possible to make *internal* weighting corrections in these data in order to arrive at Canada-wide estimates, as was the case in the CSC data. Instead, weighting factors were calculated on the basis of the relationship between, on the one hand, Ontario and Quebec estimates and, on the other hand, the estimates for all of Canada *in the CSC study*. These FII extrapolations must be considered to be very tentative.

TABLE 3.4 NUMBERS OF ADMITTED NEW INMATES IN CANADIAN FEDERAL PENITENTIARIES UNDER A NEW WARRANT OF COMMITTAL AND NUMBERS OF INMATES IN THE CLAI DATABANK IN 1993-1995 BY REGION

Region	Statistics	CLAI databank	Unadjusted coverage	Adjusted coverage estimate*
Atlantic	1,778	481	27.1%	27.9%
Québec	3,884	3,318	85.4%	88.1%
Ontario	3,628	3,020	83.2%	85.8%
Prairie	3,692	987	26.7%	27.6%
Pacific	1,281	392	30.6%	31.5%
Region unknown	--	400	--	--
CANADA	14,263	8,598	60.3%	62.1%

* Adjusted to include only male admissions, using information provided in: Statistics Canada, Cat. No. 85-211-XPB.

3.1.2 The Federal Inmate Interviews (FII)

Altogether 477 new inmates were interviewed at regional reception centres in Ontario and Québec. The data were collected in the period between February and December 1999 in Québec and between September 1999 and January 2000 in Ontario. Eight files were discarded from the analyses for validity reasons, reducing the final sample to 469 inmates: 248 in Ontario and 221 in Québec. The most central data collection instrument of this study is a calendar used in charting the 36 most recent months in the inmate's life prior to detention. The focus is on several aspects of the relationship between drug and alcohol use and criminal behaviour. Much of this information is not available in the CSC data.

Reasons for attrition in the interviews at the Ontario and Québec reception centres (FII study) are shown in Table 3.5. The response rate in the Ontario part of the study, calculated out of those who were contacted for an interview, was 84.8%. The corresponding figure for the Québec part of the study was 78.9%. The lower response rate is explainable by the early Québec fieldwork serving as a pilot for subsequent interviews.

TABLE 3.5 FII STUDY: SAMPLE ATTRITION AND RESPONSE RATES IN QUÉBEC AND ONTARIO

	Québec	Ontario
Total sampled	**419**	**342**
Not eligible	44	10
Not available	90	35
Approached	**285**	**297**
- Refused	56	44
- Interrupted	4	1
Interviewed	225	252
Response rate	**78.9%**	**84.8%**

The FII study incorporates central questions from the CSC study on the inmates' use of drugs and alcohol and their criminality. It includes the same tests for dependence on alcohol (ADS) and drugs (DAST). This makes it possible to do aggregate level reliability checks of estimates from the two studies.

3.1.2.1 The abbreviated CLAI questionnaire (The Small Clai)

For comparison and generalization purposes the most central questions from the Correctional Service of Canada CLAI instrument on drug use, alcohol use and criminal behaviour were incorporated in a separate questionnaire which was filled out by the inmate during the interview session (see Appendix A). This instrument was used both in the federal samples in Ontario and Québec, and the provincial samples of male and female prisoners in Quebec.

3.1.2.2 The three-year calendar instrument

A questionnaire that probed into the alcohol and drug use, criminal activities and important life events during a three-year period preceding the inmate's latest arrest was used in the same three studies as the Small Clai. It contains a detailed listing and dating of the criminality, drug and alcohol use, legal and illegal incomes, important life events, etc (see Appendix B).

The three-year calendar was divided into 12 quarters onto which a monthly record of drug use patterns and criminality was entered. Whereas the CLAI instrument only asks for crime-specific information on alcohol and drug use in connection with the crime for which the inmate received the longest sentence, the calendar instrument strives to get a full census of the inmates' crimes over a three-year period. Because of the great number of crimes committed by many inmates, much of the information is in the form of best estimates that the inmate can provide. The great majority of these crimes have remained undetected by authorities. The great number of crime episodes and the longer reference period, among several other features, add to the power of the analyses that can be performed on the FII data. There is also a corresponding weakness in that no details can be had about individual crime events. Instead, data on substance use and crime were summarized for each of the 12 three-month periods.

The design in data entry allows analyses of drug use, alcohol use and criminal behaviour from 12 separate time periods. These periods can be used in replicating analyses and comparing the findings from different three-month periods or in sequential analyses looking at the development over time and relating it to significant events in the inmate's life. The data can also be collapsed into a joint file covering all events during 36 months.

The calendar data were filled in by the interviewer while she (all research assistants on the study were women) and the respondent together consulted the calendar in order to place occurrences in the right time period. Filling in the calendar took, as a mean, two hours.

3.1.2.3 Dependence scales

The same two psychological scales, as in the CSC study, the Alcohol Dependency Scale (ADS) and the Drug Addiction Severity Test (DAST), were used for determining whether an inmate was dependent on alcohol or drugs.

The three data collection instruments were also used in the provincial inmate studies, which are in fact full replications of the FII study (see section 4).

Brief comparison of the methodology of the CSC and FII studies

The CSC file contains information on inmates from all five regions of the federal penitentiary system. The FII study, on the other hand, was carried out on inmates in the Québec and Ontario regions only. The decision to limit the interview study to these two regions was taken for financial reasons.

Most findings from both the CSC and the FII study will be presented separately for Québec and Ontario, with an estimate for all Canadian federal inmates. Because of the correction measures, the estimates for all of Canada are naturally somewhat less reliable than those pertaining to these two regions. This is true especially in the case of the data in the FII study, where the all-Canada estimates are based on the relationships between regions found in the CSC study.

The *time periods* of data collection between the CSC and FII studies also differ. As was pointed out above, information from the years 1993-95 is used to arrive at the CSC-based estimates in this report. The FII data, on the other hand, were collected 3-6 years later. Analyses of the CSC data from the Québec region (which has been regularly providing data since the early 1990s) showed very small differences in drug use patterns among new inmates over a period of six years. This can be seen as an indication that such patterns among federal inmates may not have changed much during the 1990s.

The *selection procedure* for federal inmates in the two studies is basically the same, although the CSC study is designed as a full census (with some uneven attrition, however, as we have seen), while the FII study used a random sampling procedure to select incoming inmates to the study. Sampling was necessary because the inflow of new prisoners was greater than what could be handled by two interviewers, which was the maximum number possible for

logistical reasons. In both studies the inmates participated in the study on the average about two weeks into their stay at the reception centres.

The CLAI data from the CSC were entered by the inmate in response to questions and response alternatives appearing on a computer screen. In the FII study, on the other hand, the set of questions selected from the CSC study was completed as a write-in questionnaire by the inmate, although he was allowed to ask questions on the meaning of questions, etc. Most of the interview session was spent on the 36-month calendar, with the interviewer and the inmate cooperating in an effort to register incidents and patterns as truthfully as possible.

3.2 The data

All the studies collected information that made it possible to examine the relationship between the use of alcohol and illicit drugs and criminal behaviour. Several different approaches were used. The CLAI instruments used in the CSC and FII studies focused on the immediate link, asking a detailed set of questions about the use of substances at the time of one specific crime event. The crime selected for special scrutiny was the one for which the inmate had received the longest sentence. These crimes will be referred to as "the most serious crime".

In addition to details about a relatively serious crime, there was a need for information about an unbiased sample of *committed* crimes whether detected or not and about the frequency with which crimes were committed. This was achieved with the help of the calendar instrument where information on all criminality during a three-year period was registered (see Appendix B). Many of the inmates had committed a great number of relatively petty crimes (such as drug sales, shoplifting, etc.) amounting in many cases to several crimes per day. This is reflected in the high number of crimes analyzed in sections 3.3.1.2 and 6.5.

Violent crimes (homicides, assaults, attempted murders and sexual offences) are relatively common among federal inmates, ranging between 20% and 29% in the five samples of most serious crimes (Table 3.6). This naturally reflects the fact that the laws concerning violent crime are more severe than for most other crimes. However, gainful crimes (mainly property crimes such as break and enter, theft, robberies, etc.) have a larger share, while drug crimes are not represented in proportion to their share in the crimes census data, which was collected with the help of the calendar instrument (as seen in section 3.2.2.1).

TABLE 3.6 DISTRIBUTION OF THE DIFFERENT TYPES OF CRIMES IN THE FEDERAL INMATE STUDIES

	Violent crimes	Gainful crimes	Drug crimes	Other crimes	Total
Most serious crime (CLAI)					
CANADA, CSC	2,359 (27.4%)	3,933 (45.7%)	879 (10.2%)	1,427 (16.6%)	8,598 (100%)
- Ontario, CSC*	937 (31.0%)	1,294 (42.8%)	475 (15.7%)	314 (10.4%)	3,020 (100%)
- Quebec, CSC*	690 (20.8%)	1,629 (49.1%)	700 (21.1%)	299 (9.0%)	3,318 (100%)
Ontario , FII	73 (29.4%)	102 (41.1%)	43 (17.3%)	30 (12.1%)	248 (100%)
Québec, FII	45 (20.4%)	112 (50.7%)	49 (22.2%)	15 (6.8%)	221 (100%)

* Included in the total for Canada

3.3 The results

Identical sets of questions on alcohol and drug use patterns were used in the Canada-wide material collected by the CSC, the interviews with federal inmates in Ontario and Québec, and the Québec interviews with male and female provincial inmates. In this section we will report on the findings pertaining to the federal inmates. This will be done separately for Ontario and Québec with weighted estimates (CSC study) and extrapolations (FII study) being presented for the total population of federal inmates in Canada.

3.3.1 Prevalence of use of and dependence on alcohol and drugs (aims 1 and 2)

3.3.1.1 Users

Questions about general patterns of substance use and abuse referred to the six-month period immediately preceding the inmate's last arrest. The results in Table 3.7 show that the predominant pattern was to have used both alcohol and one or more illicit drugs during the six months.

TABLE 3.7 FEDERAL INMATES: ALCOHOL AND DRUG USE IN THE LAST 6 MONTHS

	CSC			**FII**		
	Ontario (3,020)	Quebec (3,318)	Canada (8,598)*	Ontario (248)	Quebec (221)	Canada** (extrapolated)
Used in last 6 months						
alcohol only	40	31	**34**	48	36	40
drugs only	9	8	**8**	3	8	5
drugs and alcohol	35	47	**45**	41	45	47
Non-users	17	14	**14**	8	11	9
Total	101%	100%	101%	100%	100%	101%

* Unweighted base figure. The weighted sample size is 12,404.

** The extrapolation was done by applying the numerical relationship between the Canada figure and the Québec and Ontario figures in the CSC study to the Ontario and Québec data in the FII study.

A central estimate for all newly admitted Canadian federal inmates in the 1993-95 period is that slightly more than half (53%) had used an illicit drug during a six-month period. (The weaker, extrapolated estimate from the interview study of 1999-2000 is 52%.) Close to half (45%) of the federal inmates in Canada had used both alcohol and an illicit drug during the six months preceding their last arrest. (In the FII study, this proportion is 47%). Judging by both the CSC and the FII studies the combination of alcohol and drug use seems somewhat more common among federal inmates in Québec than in Ontario.

The isolated use of alcohol is much more common than the isolated use of illicit drugs; the inmates who use drugs also tend to use (the more easily available) alcoholic beverages at least occasionally. Less than 10%of the inmates had used only drugs and no alcohol during

these six months. The greatest difference in prevalence between the studies is in the share of non-users (5 percentage points) and users of only alcohol (6 percentage points).

The prevalence of drug use is much greater than in the general adult population in Canada or in Québec where respectively 8% and 18% had used drugs during a *12-month* period (Canadian Centre on Substance Abuse, 1999; Institut de la statistique du Québec, 2000). However, if we want to compare our prevalence rates in this way, we must use a comparable age and gender group. The prevalence of drug use in a 12-month period in the Québec male population aged 25-44 was 22% (Institut de la statistique du Québec, 1998). It can safely be said that our inmate samples include more users of illicit drugs than do similar age-sex groups in the general population. Nothing can be inferred about the possible effect of drug use on crime or vice versa from such figures of association.

As in the general population, cannabis was the most widely used drug, although the prevalence figure of 42% (Table 3.8) is much higher than in the average Canadian male population of the same age. The use of cocaine (28%) and heroin (7%) also transcend what is commonly found among young males in general population studies (Canadian Centre on Substance Abuse, 1999; Institut de la statistique du Québec, 2000). The use of all substances except heroin is more common and more frequent among federal inmates in Québec than in Ontario.

Although a greater proportion of inmates were alcohol users than were drug users (79% versus 52%), there was no difference in the proportion that had used these substances at least a few times per week (30% for each substance; Table 3.8). Extrapolated estimates are available from the FII study on the prevalence of drug use: 55% had used drugs at least once and 35% had used drugs at least a few time per week during the six months preceding arrest (not shown in tables). These estimates do not differ greatly from the CSC estimates of three to six years earlier.

TABLE 3.8 CSC STUDY: ALCOHOL AND DRUG USE AMONG NEWLY ARRIVED FEDERAL INMATES DURING THE LAST 6 MONTHS PRECEDING ARREST

	Ontario (3,020)	Quebec (3,318)	Canada (8,598)*
Used at least once in 6 months			
Alcohol	76	79	**79**
Drugs	43	54	**52**
- cannabis	35	43	**43**
- cocaine	23	36	**28**
- heroin	7	6	**7**
Alcohol and drugs together	30	43	**40**
Used at least a few times per week in last 6 months			
Alcohol	29	30	**30**
Drugs	25	31	**30**
- cannabis	15	20	**20**
- cocaine	12	19	**15**
- heroin	4	3	**4**
Alcohol and drugs together	9	16	**13**

* Unweighted base figure. The weighted sample size is 12,404.

About 40% of Canadian male federal inmates had used illicit drugs *together* with alcohol on at least one occasion during the six months, while 13% had used them together at least a few times per week during this period (Table 3.8). This combined use is considerably more common in the Québec region.

3.3.1.2 Drug and alcohol dependence

As was mentioned earlier, two widely used dependence scales were administered for the purpose of identifying inmates who were addicted to (dependent on) drugs or alcohol: the Drug Addiction Severity Test (DAST) and the Alcohol Dependence Scale (ADS).

According to the two scales, a smaller proportion of federal inmates were dependent on alcohol than on drugs (Table 3.9). A relatively high level of alcohol abusers in the regions outside Ontario and Québec increases the prevalence of alcohol-dependent federal inmates in all of Canada to 8% (CSC) from the 7% in Ontario and 5% in Québec. An extrapolation from the FII data places the all-Canada figure at 5%. The same relative preponderance of alcohol abuse in the three regions outside Québec and Ontario also raises the all-Canada prevalence of double dependence on both alcohol and drugs to 8% (CSC). The FII study provides the identical estimate.

It should perhaps be pointed out that although the *use* of both drugs and alcohol is very common in this population (Table 3.8), the *dependence* on both substances is relatively low (Table 3.9). It is also apparent that the individuals who are dependent on illicit drugs also use alcohol either regularly or from time to time.

Almost a quarter of the federal inmates (23%, CSC) were dependent or one or more illicit drugs, without a concomitant alcohol dependence. The estimates from the FII study are higher for both Ontario and Québec, giving us a tentative all-Canada estimate of 31%. Both studies place Québec higher than Ontario in the prevalence of "pure" drug dependence.

TABLE 3.9 FEDERAL INMATES: ALCOHOL AND DRUG DEPENDENCE AMONG NEWLY ADMITTED FEDERAL INMATES DURING THE LAST 6 MONTHS PRIOR TO ARREST

	CSC			FII		
	Ontario (3,020)	Québec (3,318)	**Canada (8,598)***	Ontario (248)	Québec (221)	Canada** (extrapolated)
Dependent in last 6 months …						
on alcohol only	7	5	**8**	6	2	5
on drugs only	19	25	**23**	26	35	32
on alcohol and drugs	5	6	**8**	4	7	8
Not dependent	69	64	**62**	64	56	56
Total	100	100	101	100	100	101

* Unweighted base figure. The weighted sample size is 12,404.

** The extrapolation was done by applying the numerical relationship between the Canada figure and the Québec and Ontario figures in the CSC study to the Ontario and Québec data in the FII study.

In total, 38% (CSC) of Canadian inmates were dependent on psychoactive substances (illicit drugs, alcohol, or both). The more tentative estimate from the FII study is 44%. It is not

possible to make any reliable comparisons of the prevalence of dependence on alcohol with that in the general population of Canada. Nevertheless, the estimate from our male federal inmate sample was 16%, of which half was also dependent on one or more illicit drugs. This is a very high figure compared to general population estimates presented in the literature.

3.3.2 Crimes committed by dependent and non-dependent inmates

Because dependence on various substances is a central factor in linking alcohol and drug use to criminal behaviour, we will in this subsection report some findings on the criminality of substance-dependent inmates and how this criminality differs from that of the rest of the inmate population.

Table 3.10 summarizes the share of dependent and non-dependent users and non-users of alcohol and drugs in the CSC material.

TABLE 3.10 CSC STUDY: PROPORTIONS OF NON-USERS, NON-DEPENDENT USERS AND DEPENDENT USERS OF ALCOHOL AND DRUGS DURING THE 6 MONTHS THAT PRECEDED ARREST (N=8 598)

	Alcohol	**Drugs**
Non-users	21	48
Non-dependent users	63	21
Dependent users	16	31
Total	100%	100%

Alcohol-dependent inmates are twice as likely to have committed violent crimes as their most serious crime compared with those dependent on drugs: 37% compared to 18% (Table 3.11). They are correspondingly less likely to have a gainful crime as their index crime. The higher proportion of the remaining category of "other crimes" among alcohol-dependent individuals can at least in part be explained by drunk driving being included among these crimes. Drug-dependent individuals have committed relatively more drug crimes, as could be expected. There is considerable agreement in the findings from the two studies.

TABLE 3.11 THE NATURE OF THE MOST SERIOUS CRIME COMMITTED BY INMATES WHO WERE DEPENDENT ON ALCOHOL OR DRUGS

	Canada			
Type of crime	Alcohol-dependent		Drug-dependent	
	CSC	FII	CSC	FII
	(1,120)	(46)	(2,402)	(171)
Violent	37	35	18	14
Gainful	45	52	60	67
Drug crime	5	0	14	16
Other crime	13	13	8	3
Total	100	100	100	100

Only the CSC study has the required number of cases for a more detailed analysis of crime categories (Table 3.12). Because there are many more drug-dependent than alcohol-dependent federal inmates, they also dominate many of the individual crime categories. Robberies, breaking and entering and thefts are most clearly dominated by drug-dependent perpetrators and so are, not unexpectedly, drug offences. In relative terms, sex offences are

the most clearly alcohol-related ones, although less than one-fifth of the sex offenders were dependent on any substance. Assaults and homicides also have relatively high shares of alcohol-dependent offenders. The highest proportions of substance-dependent perpetrators are found in the theft, robbery and break and enter categories.

TABLE 3.12 CSC STUDY: PREVALENCE OF DRUG AND ALCOHOL DEPENDENCE AMONG PERPETRATORS OF DIFFERENT TYPES OF MOST SERIOUS CRIMES

	Drug-dependent only	Alcohol-dependent only	Drug and alcohol-dependent	Not dependent	Total
Homicide (535)	15.7	13.5	9.2	61.7	100%
Att. murder (130)	14.6	7.7	10.0	67.7	100%
Assault (581)	15.8	16.2	10.2	57.8	100%
Robbery (1,811)	33.6	5.4	8.9	52.1	100%
Sex offence (1,052)	6.6	7.9	4.2	81.4	100%
Break &enter (1,146)	31.2	6.4	6.4	56.1	100%
Theft (466)	33.3	5.4	10.7	50.6	100%
Fraud (262)	12.2	2.3	1.9	83.6	100%
DWI (235)	4.3	23.8	6.0	66.0	100%
Drug offence (1,427)	21.7	1.3	2.3	74.7	100%
All crimes (8,598)*	**22.7**	**8.0**	**7.7**	**61.6**	100%

* Includes all other crimes, which are not listed in the table (N=953).

A limitation of the results discussed so far in this section on federal inmates is that they only deal with one crime per inmate (the crime for which they received the longest sentence). In the next subsection we shall present findings on the criminality of substance-dependent inmates from the calendar instrument. Within the constraints of the methodology, these findings apply to all crimes committed by the inmate during a 36-month period.

3.3.3 Analyses of all crimes committed over a six-month period

Aims 4, 5 and 6 pertain to proportions of crime episodes that were committed by users and abusers of illicit drugs and alcohol. Relevant analyses can also be carried out using data from the calendar part of the inmate interviews (the FII study).

In the calendar, crime events committed by an inmate were coded into three-month periods (see Appendix B). Considering that the crime events reported in the calendar study number in the thousands, it was not possible to record (or for the inmate to remember) alcohol or drug intoxication at the time of the crime, or other types of substance involvements for each individual crime event. Associations between drugs or alcohol and crimes committed is instead available for each three-month period as a whole.

The life of many of the inmates found in federal or provincial custody is an existence characterized by scattered periods of freedom interspersed with periods of parole, arrest, detention in correctional facilities and treatment. Changes in these conditions can occur several times in a three-year period.[14] In studying the temporal relationship between drug and alcohol use and criminal activities, it is important to take these periods into account since they obviously may bias prevalence estimates and relationships.

[14] These sequences can be studied in our calendar data for both federal and provincial inmates.

The number of inmates in our data with *no* interruptions to their lives in freedom even in a six-month period turned out to be too small for the intended analyses. A compromise had to be struck. It was found that the optimal solution was to conduct analyses on the calendar record of inmates who had been *in detention less than 30 days* during the period between 6 and 12 months prior to the month of interview. They had, in other words, been free to use drugs or alcohol and commit crimes at least 150 days out of the approximately 180 in the six-month period.

The separate federal samples from the Ontario and Québec interviews were too small for the intended analyses. The combined number of inmates from the two regions who satisfied the above criteria was 254, which is 54% of the total sample. It was assumed that this combined sample would reflect the frequency of criminal behaviour among newly arrived federal inmates during the 6 to 12 months preceding last arrest.

In accordance with the stated aims, we examined the three different types of substance involvement for three user groups: (1) non-users of alcohol or drugs, (2) users of either or both substances, and (3) those dependent on either or both substances. There were 14% non-users of substances during the period 7-12 months prior to interview in our sample of 254 federal inmates, while 48% were non-dependent users of one or more psychoactive substance (in most cases they used both alcohol and drugs) and 38% were substance-dependent (mostly on drugs). These 254 inmates reported having committed a total of 30,036 crimes during the six-month period. Out of these 23,547, or 78%, were drug crimes, mainly trafficking and possession of illicit drugs, while 6,489 (22%) were other types of crimes.

The proportions of crimes committed by the three user groups are shown in Table 3.13, separately for all types of crimes and for non-drug crimes.

TABLE 3.13 FII STUDY: PROPORTIONS OF ALL CRIMES AND NON-DRUG CRIMES COMMITTED BY NON-USERS, NON-DEPENDENT USERS AND SUBSTANCE-DEPENDENT OFFENDERS

	All crimes	**Non-drug crimes**
	(30,036)	*(6,489)*
Non-users	5.1%	3.7%
Non-dependent users	35.8%	25.4%
Dependent users	59.1%	70.9%
Total	100.0%	100.0%

There were considerable differences between the user groups in the mean number of crimes committed during the six-month period (Table 3.14).

TABLE 3.14 FII STUDY: MEAN NUMBERS OF ALL TYPES OF CRIMES, NON-DRUG CRIMES AND DRUG CRIMES COMMITTED IN A 6-MONTH PERIOD (7-12 MONTHS PRIOR TO INTERVIEWS) BY NON-USERS, NON-DEPENDENT USERS, DEPENDENT USERS AND ALL INMATES

	All crimes	**Drug crimes**	**Non-drug crimes**
Non-users (35)	43.7	36.9	6.8
Non-addicted users (123)	87.4	74.0	13.4
Dependent users (96)	185.0	137.1	47.9
All inmates (254)	118.3	92.7	25.6

These numbers can be translated into mean numbers of crimes committed in a week: while inmates in general committed about 4.5 crimes per week, non-users of psychoactive substances committed about 1.7 crimes, non-addicted users about 3.3 crimes and dependent users about 7.1 crimes during a one-week period.

It is evident that all user groups are predominantly involved in drug crimes. The volume of both drug crimes and other crimes is higher among those who are dependent on a substance than in the other two groups. However, it is perhaps somewhat unexpected that drug crimes form a greater share of the crimes of non-users (84%) and "ordinary" users (85%) than among addicts (74%).

The group of non-dependent users had committed the highest mean number of violent crimes in the six month period (Table 3.15), perhaps in part because there are probably many more alcohol users in that group, while there are many more drug users among the substance-dependent. The latter commit over six times more gainful crimes than do non-users and non-dependent users. The non-users are exceptional with their low level of violent crimes, and their concentration on drug crimes. Having been sentenced to a term in federal prison usually means that their drug crimes are not minor, and that many of these offenders are in the drug trade "strictly for the money".

TABLE 3.15 FII STUDY: MEAN NUMBERS OF VARIOUS TYPES OF CRIMES COMMITTED IN A 6-MONTH PERIOD (7-12 MONTHS PRIOR TO INTERVIEW) BY NON-USERS, NON-DEPENDENT USERS, DEPENDENT USERS AND ALL INMATES

	Non-users	Non-dependent users	Dependent users	All inmates
	(35)	(123)	(96)	(254)
Violent crime	0.1	2.8	1.2	1.8
Gainful crime	6.3	7.0	42.5	20.3
Drug crime	36.9	73.9	137.2	92.7
Other crime	0.4	3.6	4.3	3.4
All crimes	43.7	87.4	185.0	118.3
All non-drug crimes	6.8	13.4	47.9	25.5

Relating these figures to an average one-week period gives us the following means for the 4 different types of crimes: Violent crimes, 0.05 crime events per week; Gainful crimes, 1.70 crime events; Drug crimes, 5.20 crime events; Other crimes, 0.17 crime events.

3.3.4 Intoxication at the time of the crime

The association between the use of one or more psychoactive substances and criminal behaviour can be approached in a number of different ways. One approach is to examine to what extent drug- or alcohol-dependent offenders were responsible for the crimes, as we have done in the previous section. Another common method is to measure the extent to which perpetrators were "under the influence" of one or more substances at the time. Questions were asked in all inmate studies about use of psychoactive substances prior to the most serious crime on the inmate's current sentence, and whether the inmate was under the influence of drugs or alcohol at the time of the crime.

According to the all-Canada estimate from the CSC study, a total of 54% of the index crimes had been committed under the influence of one or more psychoactive substances (Table 3.16).

TABLE 3.16 PROPORTIONS OF FEDERAL INMATES WHO REPORTED BEING UNDER THE INFLUENCE OF DRUGS OR ALCOHOL AT THE TIME OF THE MOST SERIOUS CRIME ON THE CURRENT SENTENCE

	Ontario		Québec		Canada	
	CSC (3,020)	FII (248)	CSC (3,318)	FII (221)	CSC (8,598)*	FII (469)**
Under influence of						
alcohol	21	21	16	16	**24**	24
drugs	16	20	17	19	**16**	19
alc. &drugs	11	9	13	19	**14**	16
neither	53	50	54	47	**46**	42
Total	101	100	100	101	100	101

* Unweighted base figure. The weighted sample size is 12,404.

** The extrapolation was done by applying the numerical relationship between the Canada figure and the Québec and Ontario figures in the CSC study to the Ontario and Québec data in the FII study.

The corresponding estimate from the FII study was 58%. In all, 30% of the offenders in the CSC study were under the influence of drugs at the time of their most serious crime, with the corresponding estimate from the FII study being 35%. The involvement of alcohol was somewhat higher, with estimates of 38% and 40% respectively. The estimates of Table 3.16 from the two studies are remarkably similar considering the differences in methods, the 3 to 6-year difference in the period of data collection, and the potential for random errors.

The two studies of federal inmates provide large enough samples for examining the presence of cocaine, cannabis and heroin intoxication at the time of the most serious crime (Table 3.17). We can see that cocaine intoxication dominates among the illicit drugs with shares of 12% and 17% in the two studies, while cannabis intoxication (in half the cases combined with alcohol) has a higher presence at the time of the crime than does heroin. As has been found earlier (Brochu *et al.*, 1999), cannabis intoxication is much more likely to be combined with alcohol use than is the case for cocaine or heroin.

TABLE 3.17 TYPE OF SUBSTANCE THAT THE INMATE WAS INTOXICATED FROM AT THE TIME OF THE MOST SERIOUS CRIME

	CSC study	**FII study**
	Canada	Canada – extrapolated
	(8,598)*	(469)**
Alcohol only	24%	24%
Drugs only	16%	19%
Alcohol with drugs	14%	16%
- cocaine only	8%	11%
- cocaine with alcohol	4%	6%
- cannabis only	3%	6%
- cannabis with alcohol	4%	6%
- heroin only	2%	3%
- heroin with alcohol	0%	1%

* Unweighted base figure. The weighted sample size is 12,404.

** The extrapolation was done by applying the numerical relationship between the Canada figure and the Québec and Ontario figures in the CSC study to the Ontario and Québec data in the FII study.

There is a clear dichotomy between crimes committed mainly under drug intoxication and those that were committed predominantly under the influence of alcohol (Table 3.18). All three crimes that were essentially violent (homicides, attempted murders and assaults) were carried out more often under the influence of alcohol (roughly about a third of the crimes), and 21-24% were perpetrated when the inmate had used both alcohol and one or more illicit drugs. Mere drug intoxication was present in less than one-tenth of these crimes. Sex offences were the most lopsidedly alcohol-involved crimes (not counting the drinking and driving offences). Property crimes, on the other hand, were dominated by drug-intoxicated perpetrators, although breaking and entering had an almost equal share of perpetrators under the influence of alcohol. Assault offenders were under the influence of one or more substances in 72% of assaults with offenders in theft, attempted murder, homicide and robbery also showing intoxication levels above 60 per cent.

TABLE 3.18 CSC STUDY: PREVALENCE OF DRUG AND ALCOHOL INTOXICATION AMONG PERPETRATORS OF DIFFERENT TYPES OF MOST SERIOUS CRIMES (ALL-CANADA ESTIMATES)

	Drug intoxication	Alcohol intoxication	Drug and alcohol intoxication	No intoxication	Total
Homicide (535)	7.0	33.9	21.3	37.8	100%
Att. murder (130)	8.5	30.3	23.6	37.6	100%
Assault (581)	8.8	39.4	23.8	28.0	100%
Robbery (1,811)	25.1	16.2	19.1	39.6	100%
Sex offence (1,052)	3.6	33.4	12.1	50.9	100%
Break &enter (1,146)	23.5	21.6	12.8	42.0	100%
Theft (466)	32.1	19.5	15.2	33.2	100%
Fraud (262)	10.7	11.2	1.9	76.2	100%
DWI (235)	1.1	81.4	12.8	4.6	100%
Drug offence (1,427)	19.3	4.5	7.0	69.3	100%
All crimes (8,598)*	**16.2**	**23.7**	**14.3**	**45.8**	100%

* Includes all other crimes, which are not listed in the table (N=953).

3.3.5 Drugs and alcohol as incentives for criminal behaviour

As has been discussed in the introductory section of this report, some drug users, and those addicted to drugs in particular, commit crimes in order to get drugs or the means to buy drugs for personal use. These crime events contribute to the set of crimes that are associated with the use of drugs in society. Crimes are also committed for the purpose of obtaining alcohol for personal use, but such events are much more rare than the drug-related ones.

As with intoxication at the time of the most serious crime, we find that the estimates of the involvement of drugs and alcohol as incentives for crimes coincide fairly closely between the two studies of newly admitted federal inmates (Table 3.19).

About one-fourth (23%) of these federal offenders had committed their most serious crime in order to get either drugs or alcohol for personal use (Table 3.19). Fourteen per cent had obtaining only drugs as a motivating force while 2% were motivated by obtaining only alcohol for personal use. Altogether, acquiring drugs for personal use was a motivator in 21% of all index crimes of these federal inmates, while this was true for alcohol in 9% of the crimes. The combination of alcohol and drugs seems more common as a motivating force in Québec than in Ontario. (We saw earlier [in Table 3.8] that Québec federal inmates had generally used drugs and alcohol together more often than did Ontario federal inmates during the six months preceding arrest.)

TABLE 3.19 PROPORTIONS OF NEWLY ADMITTED FEDERAL INMATES WHO REPORTED HAVING COMMITTED THEIR MOST SERIOUS CRIME IN ORDER TO GET DRUGS OR ALCOHOL FOR PERSONAL USE

	Ontario		Québec		**Canada**	
	CSC (3,020)	FII (248)	CSC (3,318)	FII (221)	CSC (8,598)*	FII (469)**
In order to get						
Alcohol	2	2	2	3	**2**	2
Drugs	13	13	13	17	**14**	16
Alc. & drugs	4	4	9	7	**7**	6
Neither	81	81	76	73	**77**	76
Total	100	100	100	100	100	100

* Unweighted base figure. The weighted sample size is 12,404.

** The extrapolation was done by applying the numerical relationship between the Canada figure and the Québec and Ontario figures in the CSC study to the Ontario and Québec data in the FII study.

It stands to reason, and it is a pattern found in numerous studies, that crimes that are motivated by a wish or need to get drugs or alcohol for personal use are predominantly gainful in nature. More than 40% of thefts, 30% of break and enter crimes, and 36% of robberies were committed in order to get drugs for personal use (Table 3.20). A substantial proportion of these crimes were also designed to allow the perpetrator to get alcohol, while alcohol by itself had motivated a considerably lower proportion of inmates to commit gainful crimes. Altogether one-fifth of all drug crimes were committed for the purpose of getting drugs for personal use.

TABLE 3.20 CSC STUDY: PROPORTIONS OF VARIOUS TYPES OF MOST SERIOUS CRIMES THAT WERE COMMITTED IN ORDER TO GET DRUGS OR ALCOHOL FOR PERSONAL USE (ALL-CANADA ESTIMATES)

	To get drugs	To get alcohol	To get both	To get neither	Total
Homicide (535)	3.4	0.9	2.4	93.3	100%
Att. murder (130)	4.6	0	0.8	94.6	100%
Assault (581)	2.8	1.7	2.2	93.3	100%
Robbery (1811)	24.6	4.1	11.8	59.5	100%
Sex offence (1052)	1.0	1.5	0.7	96.9	100%
Break &enter (1146)	18.9	5.4	11.4	64.2	100%
Theft (466)	25.1	3.2	17.4	54.3	100%
Fraud (262)	8.4	3.8	3.8	84.0	100%
DWI (235)	1.3	8.1	2.1	88.5	100%
Drug offence (1427)	16.7	1.0	4.0	78.3	100%
All crimes (8,598)*	**13.5**	**2.9**	**6.8**	**76.8**	100%

* Includes all other crimes which are not listed separately in the table (N=953).

3.3.6 Substance dependence, intoxication and the incentive strength of psychoactive substances

Considering again the central association of dependence on psychoactive substances with criminality, it is of interest to know what proportion of the crimes that were committed by drug-dependent individuals (a) were carried out under the influence of one or more substances, and (b) were motivated by getting drugs for personal use. These factors are used in our method for estimating attributable fractions.

In our samples of most serious crimes, we cannot assess the relative *risks* that alcohol- and drug-dependent individuals will commit crimes, but the data will still provide information on the relative importance of intoxication and incentive among those who are substance-dependent and those who are not.

Close to 6 in 10 drug-dependent federal offenders (59%) in the Canada-wide CSC material stated that they had committed their most serious crime in order to get drugs for personal use (not shown in tables). In the federal inmate interviews (FII) from Québec and Ontario, this proportion was just under 5 in 10 (47%). Drug-dependent offenders who were frequent users of cocaine and heroin stated more often that acquiring drugs for personal use was a reason for committing the most serious crime than did those who were frequent users of cannabis.

TABLE 3.21 OFFENDERS WHO WERE UNDER THE INFLUENCE OF ALCOHOL OR ILLICIT DRUGS AT THE TIME OF THEIR MOST SERIOUS CRIME BY DEPENDENCE STATUS FOR ALCOHOL AND DRUGS COMBINED (SAMPLE SIZES ARE SHOWN IN PARENTHESES).

	CSC			FII		
	Ontario	Québec	Canada	Ontario	Québec	Canada*
Non-dependent	31%	28%	**35%**	30%	30%	36%
	(2,100)	(2,124)	(5,530)	(158)	(122)	(280)
Dependent	85%	78%	**85%**	84%	82%	87%
	(920)	(1,194)	(3,038)	(90)	(99)	(189)
Total	47%	46%	**54%**	50%	53%	60%
	(3,020)	(3,318)	(8,598)	(248)	(221)	(469)

* The extrapolation was done by applying the numerical relationship between the Canada figure and the Québec and Ontario figures in the CSC study to the Ontario and Québec data in the FII study.

Table 3.21 compares substance-dependent with non-dependent offenders with regard to being under the influence of any type of substance at the time of the most serious crime. While the non-dependent offenders in the CSC study were under the influence at the time of the crime in 35% of the cases, the dependent offenders were intoxicated in fully 85% of the crime incidents. The agreement with the extrapolated estimates from the FII study is very high.

The figures in Table 3.22 indicate that neither the non-dependent nor the dependent perpetrators differ greatly between the two studies with regard to the propensity to be motivated by the possibility of obtaining drugs or alcohol for personal use. About half the most serious crimes of substance-dependent federal inmates were committed at least in part for the purpose of acquiring drugs or alcohol for personal use. Expressing this with all inmates as the base, about 18% of all most serious crimes among new federal inmates had been perpetrated by addicts (at least in part) in order to be able to use their psychoactive substance(s) of choice.

TABLE 3.22 PROPORTIONS OF OFFENDERS WHO COMMITTED THEIR MOST SERIOUS CRIME IN ORDER TO GET ILLICIT DRUGS OR ALCOHOL FOR PERSONAL USE BY USER AND DEPENDENCE STATUS FOR ALCOHOL AND DRUGS COMBINED (SAMPLE SIZES ARE SHOWN IN PARENTHESES).

	CSC			FII		
	Ontario	Québec	Canada	Ontario	Québec	Canada*
Non-dependent	6%	9%	**9%**	8%	6%	8%
	(2,100)	(2,124)	(5,530)	(158)	(122)	(280)
Dependent	50%	54%	**49%**	41%	53%	45%
	(920)	(1,194)	(3,038)	(90)	(99)	(189)
Total	19%	25%	**24%**	19%	27%	25%
	(3,020)	(3,318)	(8,598)	(248)	(221)	(469)

* The extrapolation was done by applying the numerical relationship between the Canada figure and the Québec and Ontario figures in the CSC study to the Ontario and Québec data in the FII study.

4. Provincial inmate studies

4.1 Portrait of the male and female samples and their criminality

4.1.1 Male provincial inmates

The interview study among male provincial inmates was carried out in Centre de Détention de Montréal (Bordeaux). The prison houses about 700 inmates, who generally come from the larger Montréal area. It is one of 23 provincial prisons for men in Québec. The interviews were carried out during the period February-June 2000 by one female interviewer. Of the 137 inmates approached for an interview, three turned out not to be eligible to participate, 34 refused and 100 were interviewed. This corresponds to a response rate of 74.6%. However, six of the files had to be deleted because of inconsistent data, leaving a final sample of 94 male inmates.

Limited and rather tentative generalizations regarding the differences between provincial and federal inmates can be made for the province of Québec by comparing findings from the provincial study with the Québec part of the CSC study and the FII study among Québec federal inmates. All estimates from the provincial data are limited by the small sample size.

4.1.2 Female provincial inmates

The interview study among female provincial inmates was carried out at Tanguay prison for women in Montréal. The prison houses about 100 women. The interviews were conducted between May and September 2000 by two female interviewers. A total of 129 women were asked to participate, and 100 of these consented to be interviewed, for a response rate of 77.5%. This is comparable to the response rate obtained for Québec's male provincial and federal inmates (74.6% and 78.9%).

4.1.3 Some methodological considerations

The combined sample of male and female inmates taken from two of Québec's provincial penal institutions is not representative of the provincial incarcerated population found in Québec. Women form a much smaller share of the provincial inmate population than men, counting for only a little more than 7% of the overall population. We cannot, therefore, make a joint analysis grouping men and women in the same population. We can, however, compare the results from separate analyses of the male and female samples.

4.1.4 Criminality of male and female provincial inmates

The breakdown of the most serious crime on the current sentence in the four major categories presents similar distributions for male and female inmates, with violent crimes being comparatively rare (8.5% for males and 5.0% for females). The same is true for drug crimes (6.4% for males and 4.0% for females). Gainful crimes, for their part, represent around one-third of the most serious crimes committed by male (31.9%) and female (34.0%) inmates in our samples. The largest proportion of inmates is in fact found under the category "other crime". This is the case for both male (53.4%) and female inmates (57.0%).

Comparing the distribution for males to that of Québec's male federal inmates, we find that the share of violent crime is considerably larger among the latter with violent crimes representing 20.4% of the most serious crime distribution, gainful crimes 50.7% and drug crimes 22.2%. All other crimes represented only 6.8% of the total. The large number of inmates found under the "other crimes" category reflects the incarceration practices found at the provincial prison level in Québec. Most of the cases included in the "other crime" category are, for men, cases of non-payment of fines and, for women, cases of prostitution (solicitation).

Table 4.1 shows the number and percentages of the four major types of crime among the male and female inmates in both the most serious crime sample and the census of crimes in a 3-year period.

TABLE 4.1. DISTRIBUTION OF THE DIFFERENT TYPES OF CRIMES IN THE QUEBEC PROVINCIAL INMATE STUDIES

		Violent crimes	**Gainful crimes**	**Drug crimes**	**Other**	**Total**
Male provincial inmates	Most serious crime	8 (8.5%)	30 (31.9%)	6 (6.4%)	50 (53.4%)	94 (100%)
	All crimes in 3-year period	198 (0.1%)	23,210 (11.0%)	176,240 (83.8%)	10,606 (5.0%)	210,214 (100%)
Female provincial inmates	Most serious crime	5 (5.0%)	34 (34.0%)	4 (4.0%)	57 (57.0%)	100 (100%)
	All crimes in 3-year period	120 (0.1%)	224,885* (57.0%)	159,739 (40.5%)	9,246 (2.3%)	393,990 (100%)
	All crimes in 3-year period *except prostitution*	120 (0.1%)	23,120* (12.1%)	159,739 (83.1%)	9,246 (4.7%)	192,225 (100%)

* Over 90% of the gainful crimes of female provincial inmates were prostitution crimes. This affects the crime distribution very significantly and skews the comparison with male inmates. By leaving out the prostitution crimes we obtain much more comparable distributions among male and female provincial inmates concerning the census of crimes committed in a 3-year period.

The data recorded in the Calendar instrument, i.e., the review of all crimes reported by males and females for the three-year period preceding incarceration, shows a very different distribution from that found for the most serious crime. Leaving out the prostitution crimes, which heavily skew the distribution of female criminality, results in very similar crime characteristics among men and women. Over the three-year period, violent crimes count for less than 1% of the crime samples, gainful crimes represent around 12%, and other crimes correspond to 5% for men and 2.3% for women. Drug crimes, on the other hand, are by far the most common crimes in this distribution, counting for about 83%.

These results reflect the fact that individuals involved in certain criminal activities commit a much greater volume of crimes than others. This is the case for drug activities in particular, where the men as well as the women confessed to more than 150,000 crimes over the three-year period covered by the calendar interview.

4.2 Prevalence of use and dependence on alcohol and drugs (aims 1 and 2) among male and female provincial inmates

4.2.1 Users

As was the case in the studies of federal inmates, questions about general patterns of substance use and abuse referred to the six-month period immediately preceding the inmate's last arrest. The results in Table 4.2 show that, in the same way as for male federal inmates, the predominant pattern for both male and female provincial inmates was to have used both alcohol and one or more illicit drugs during the six months prior to their arrest. This was the case for 57.4% of male inmates and 46.0% of female inmates. Female inmates tended to report no substance consumption during this period in a slightly greater proportion (11.0%) than male inmates (6.4%). A greater proportion of female inmates than male inmates reported having used only drugs during the six-month period. On the other hand, men more than women stated that they had used alcohol only and no drugs (31.9% vs. 25.0%).

TABLE 4.2. QUEBEC PROVINCIAL INMATES: ALCOHOL AND ILLICIT DRUG USE IN THE LAST 6 MONTHS

	Bordeaux (men)	Tanguay (women)
Alcohol use only	30 (31.9%)	25 (25.0%)
Drug use only	4 (4.3%)	18 (18.0%)
Both alcohol and drug use	54 (57.4%)	46 (46.0%)
No alcohol or drug use	6 (6.4%)	11 (11.0%)
Total	94 (100.0)	100 (100.0%)

4.2.2 Drug and alcohol dependence among provincial male and female inmates

Dependence on drugs and alcohol was again measured by the two widely used scales: the Drug Addiction Severity Test (DAST) and the Alcohol Dependence Scale (ADS). According to these two instruments, more than half the male (52.1%) and female (51.0%) inmates showed dependence on neither alcohol nor drugs, while one-third of the two groups (33.0% for men and 32.0% for women) proved to be addicted only to drugs (Table 4.3). A much smaller share of inmates demonstrated both alcohol and drug dependence (10.6% of males and 11.0% of females). Even more infrequent are those who were dependent on alcohol only (4.3% of male inmates, and 6.0% of female inmates).

TABLE 4.3 ALCOHOL AND DRUG DEPENDENCE AMONG QUEBEC PROVINCIAL INMATES DURING THE 6 MONTHS PRIOR TO THEIR ARREST

Dependent on …	Bordeaux (men)	Tanguay (women)
Alcohol only	4 (4.3%)	6 (6.0%)
Drugs only	31 (33.0%)	31 (31.0%)
Both alcohol and drugs	10 (10.6%)	11 (11.0%)
Not dependent	49 (52.1%)	51 (51.0%)
Total	94 (100.0%)	100 (100.0%)

4.2.3 Proportions of non-users, non-dependent users and dependent users of alcohol and drugs during the six months prior to their arrest

Very few men (6.4%) and women (11.0%) in our samples reported no use of substances during the six months prior to their arrest (Table 4.4). Nearly equal proportions were found to be non-dependent users (45.7% of men and 41.0% of women) and dependent users (47.5% of men and 48.0% of women) for either or both types of substances.

TABLE 4.4 PROPORTIONS OF NON-USERS, NON-DEPENDENT USERS AND DEPENDENT USERS OF ALCOHOL AND DRUGS DURING THE 6 MONTHS PRIOR TO THEIR ARREST

	Bordeaux (men)	Tanguay (women)
Non-users	6 (6.4%)	11 (11.0%)
Non-dependent users	43 (45.7%)	41 (41.0%)
Dependent users	45 (47.5%)	48 (48.0%)
Total	94 (100.0%)	100 (100.0%)

4.3 Crimes committed by dependent and non-dependent inmates

It was stated before that because dependence on various substances is associated with criminal behaviour, it is important to try to assess the determinant strength of dependence. One way of doing this is to examine the criminality of substance-dependent inmates and to compare it to the criminality of the segment of inmates who were non-dependent users and those who reported not using any substances.

Table 4.5 shows that alcohol-dependent inmates are more likely to commit violent crimes as their most serious crime than those dependent on drugs. This applies to men as well as women. In other respects the distributions for men and women differ only slightly. However, the distributions are difficult to interpret since the numbers of alcohol-dependent men and women are small compared to drug-dependent men and women.

TABLE 4.5 THE NATURE OF THE MOST SERIOUS CRIME COMMITTED BY INMATES WHO WERE DEPENDENT ON ALCOHOL OR DRUGS

	Bordeaux dependent inmates		Tanguay dependent inmates	
	Alcohol-dependent	Drug-dependent	Alcohol-dependent	Drug-dependent
Violent crimes	2 (14.3%)	4 (9.0%)	2 (11.8%)	3 (7.1%)
Gainful crimes	7 (50.0%)	18 (43.9%)	7 (41.2%)	22 (52.4%)
Drug crimes	1 (7.1%)	3 (7.3%)	–	3 (7.1%)
Other crimes	4 (28.6%)	16 (39.0%)	8 (47.1%)	14 (33.3%)
Total crimes	14 (100%)	41 (100%)	17 (100%)	42 (100%)

4.4 Intoxication at the time of the crime

As stated before, the association between use of one or more psychoactive substances and criminal behaviour can be approached in a number of different ways. Among other possible methods, it can be done by measuring the extent to which perpetrators were under the influence of one or more substances at the time when they committed a crime. Questions were asked in this study about consumption of psychoactive substances prior to the most serious crime on the inmate's current sentence, and whether the inmate was under the influence of drugs or alcohol at the time of the crime.

TABLE 4.6 PROPORTION OF QUEBEC PROVINCIAL INMATES WHO REPORTED BEING UNDER THE INFLUENCE OF DRUGS OR ALCOHOL AT THE TIME OF THE MOST SERIOUS CRIME ON THE CURRENT SENTENCE

Crime committed under the influence of…	Bordeaux (men)	Tanguay (women)
Alcohol only	22 (23.4%)	10 (10.0%)
Drugs only	14 (14.9%)	28 (28.0%)
Both alcohol and drugs	20 (21.3%)	9 (9.0%)
Neither alcohol nor drugs	38 (40.4%)	53 (53.0%)
Total	94 (100.0%)	100 (100.0%)

The two studies also provide detailed data on the individual drugs used prior to the most serious crime. Table 4.7 shows that cocaine intoxication was especially high among women at the time of the crime; fully 27% were under the influence of cocaine compared to 15% among men. Cannabis intoxication, on the other hand, was more common among men (21%) than among women (9%). Being under the influence of heroin rarely occurs among men (1%), while women had a relatively high prevalence (8%)

TABLE 4.7 TYPE OF SUBSTANCE THAT THE INMATE WAS INTOXICATED FROM AT THE TIME OF THE MOST SERIOUS CRIME

	Bordeaux	Tanguay
	(94)	(100)
Alcohol only	22 (23.4%)	10 (10.0%)
Drugs only	14 (14.9%)	28 (28.0%)
Alcohol with drugs	20 (21.3%)	9 (9.0%)
- cocaine only	4 (4.3%)	15 (15.0%)
- cocaine with alcohol	4 (4.3%)	5 (5.0%)
- cocaine + other drugs	7 (7.4%)	7 (7.0%)
Overall cocaine	15 (16.0%)	27 (27.0%)
- cannabis only	7 (7.4%)	6 (6.0%)
- cannabis with alcohol	8 (8.5%)	2 (2.0%)
- cannabis + other drugs	5 (5.3%)	1 (1.0%)
Overall cannabis	20 (21.3%)	9 (9.0%)
- heroin only	1 (1.1%)	1 (1.0%)
- heroin with alcohol	--	--
- heroin + other drugs	--	3 (3.0%)
- Overall heroin	1 (1.1%)	4 (4.0%)

Table 4.8 displays findings that are not unexpected: dependent substance users were more likely to have been under the influence of a substance at the time of the most serious crime than were non-dependent inmates. A more novel finding is that the difference between the

two groups of offenders is much greater among female inmates (17% versus 79%) than among male inmates (47% versus 73%).

TABLE 4.8 OFFENDERS WHO WHERE UNDER THE INFLUENCE OF ALCOHOL OR ILLICIT DRUGS AT THE TIME OF THEIR MOST SERIOUS CRIME BY DEPENDENCE STATUS FOR ALCOHOL AND DRUGS COMBINED

Crime committed under the influence	Bordeaux (men)	Tanguay (women)
Non-dependent	23/49 (46.9%)	9/52 (17.0%)
Dependent	33/45 (73.3%)	38/48 (79.2%)
Total	56/94 (59.6%)	47/100 (47.0%)

4.5 Crimes committed in order to get drugs or alcohol

The extent to which getting drugs or alcohol was a motivating force in the commission of the most serious crime (Table 4.9) is very similar to the figures found in the federal inmate studies. The differences between the sexes are remarkably small in light of the other differences found with regard to the role of drugs and alcohol.

TABLE 4.9. PROPORTIONS OF OFFENDERS WHO COMMITTED THEIR MOST SERIOUS CRIME IN ORDER TO GET ILLICIT DRUGS OR ALCOHOL FOR PERSONAL USE

Crime committed in order to get…	Bordeaux (men)	Tanguay (women)
Alcohol only	2 (2.1%)	1 (1.0%)
Drugs only	13 (13.8%)	15 (15.0%)
Both alcohol and drug	5 (5.3%)	2 (2.0%)
Neither alcohol nor drug	74 (78.7%)	82 (82.0%)
Total	94 (100.0%)	100 (100.0%)

A relative lack of differences between male and female provincial inmates is also evident in Table 4.10, which shows the extent to which substance-dependent and non-dependent inmates were motivated by personal use of drugs or alcohol when they committed their most serious crime. This was the case for approximately one-third of both female and male substance dependent inmates.

TABLE 4.10 OFFENDERS WHO COMMITTED THEIR MOST SERIOUS CRIME IN ORDER TO GET ALCOHOL OR ILLICIT DRUGS FOR PERSONAL USE BY DEPENDENCE STATUS FOR ALCOHOL AND DRUGS COMBINED

Crime committed under the influence of drugs or alcohol	Bordeaux (men)	Tanguay (women)
Non-dependent	4/49 (8.2%)	2/52 (3.8%)
dependent	16/45 (35.6%)	16/48 (33.3%)
Total	20/94 (21.3%)	18/100 (18.0%)

5. The study of arrestees

An opportunity to conduct a study on individuals arrested for a variety of crimes was presented through the cooperative effort of the Canadian Association of Chiefs of Police and the RCMP. Whereas the data in the inmate studies were provided by the perpetrators themselves, the arresting officer was the informant in the arrestee study. Data from the study of arrestees adds information on another population of relevance to the connections between drugs, alcohol and crime.

The estimates from this study only apply (very roughly) to cities of 100,000 and over. The cities included in our sample contain 45% of the Canadian population, but the selection of arrestees is too scattered to provide reliable estimates applicable to this population. It would have required the participation of a great many police departments, and would have added considerably to the logistical costs, to obtain enough cases for systematic analyses of arrests in these cities and to include smaller communities in the study.

Another difference from the inmate studies is that many of the arrestee crimes are not serious enough to warrant a prison sentence. The arrestee sample probably provides a more representative sampling of criminal events that occur in the community than do the studies among inmates.

5.1 Methodology

Information was collected on arrests made in 26 Canadian locations during a one-month period (in May and June, 2000). These data were collected by police officers, and are based on information available to them at the time of the arrest. Most sites were selected on the basis of a stratification of Canadian communities according to population size; (a) 2 mega-cities (with populations over 1 million), (b) 3 large cities (500,000 to 1 million), (c) 3 medium-size cities (250,000 to 500,000), (d) 6 small cities (100,000 to 250,000). In addition, another 12 communities were purposively selected because of their intrinsic relevance to the substance-crime link, or because there was interest locally in obtaining information on the alcohol and drug involvement of the local crime scene.[15] Sites within categories b and c were selected on the basis of statistical information on their overall crime rate: one characterized by a relatively high crime rate, one with a medium rate and one with a low crime rate. The same sampling procedure was used in category d, with two sites being selected into each of the three crime strata[16]. Table 5.1 shows the distribution of the cases over the different locations.

15 Separate brief reports were prepared for the communities that were not part of the systematic sampling frame. No findings from these communities are included in this report because the sampling is not based on any replicable selection principles.

16 Stratification was not carried out in the “mega-city” category, which only consisted of Montréal and Toronto.

5.1.1 The Arrestee Study Form

A questionnaire was designed for the use of the police officers in recording data about the arrested person, his/her drug and alcohol use, the nature of the offence, etc. (see Appendix C). The questions were kept to a minimum because the police officers had to fill out the questionnaire while performing their regular duties. The special nature of the data collection method also meant that the questions asked could not be identical to those in the other studies, where the perpetrators themselves answered the questions.

5.1.2 Fieldwork

As it is evident from Table 5.1, not all the cities reached the target of 200 arrests, and the sample sizes vary greatly.

TABLE 5.1 THE SAMPLE SIZES FROM THE SAMPLED CITIES PARTICIPATING IN THE STUDY OF ARRESTED INDIVIDUALS, MAY, 2000*

	Number of arrests
(1) 2 cities with over 1 million population	
Montréal	232
Toronto	200
(2) 3 cities with a population between	
500,000 and 1 million	
low crime rate (Québec City)	124
medium crime rate (Calgary)	158
high crime rate (Vancouver)	200
(3) 3 cities with a population between	
250,000 and 500,000	
low crime rate (Kitchener)	83
medium crime rate (Windsor)	128
high crime rate (Victoria)	42
(4) 6 cities with a population between	
100,000 and 250,000	
low crime rate	
- Sherbrooke	14
- Fredericton**	54
medium crime rate	
- St. John's, Nfld	141
- Halifax	185
high crime rate	
- Regina	200
- Saskatoon	129
TOTAL	1,890

* Most of the sampled arrests in Montréal were carried out in June, and not in May as planned. In all probability, this deviation has a negligible effect on the results.

** According to the Canadian population census of 1996 the population of Fredericton is 76,000. Strictly speaking, the city does not qualify to be included in the 100,000 to 250,000 population category; however, no other suitable city was available for inclusion and Fredericton was the largest city under the required population size that fit the criteria of inclusion.

It is also clear that the total sample is not self-weighting with regard to population size. In order to achieve this, Montréal and Toronto would have had to provide samples that were about 10 to 20 times larger than those from the cities with populations ranging between 100,000 and 250,000. This type of study design was not possible with the means available. By adding up we get the sizes of the samples from the different city size strata: the mega-cities: 432; stratum #2: 482; stratum #3: 253; and stratum #4: 723. Leaving out the mega-cities, we can also look at the strata for the different crime rates: low crime rate: 275; medium crime rate: 612 ; high crime rate: 571.

5.1.3 The nature of the data

Compared to the CSC study of federal inmates, the arrestee study is much more difficult (perhaps impossible) to weight to make it more representative of Canada as a whole. The difficulties are linked to the sampling: (1) cities were systematically sampled (not randomly), (2) precincts were sampled in a way that was not random, (3) the samples from different cities are not related to their size or their crime rate, etc.

No weighting or any other corrections will therefore be attempted with the arrestee data. The results give us "ballpark figures", very rough estimates, of what we would find by a more scientific sampling. Judging by past experience and despite local variations in many prevalence figures, the effect of weighting procedures on total prevalence estimates seems to be rather limited if a reasonable number of second-level units (in our case, the cities) are included.

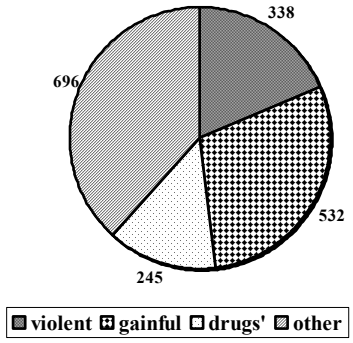
5.1.4 Selection of crime events

The typical starting point in the most serious crime samples of the CSC, FII and PII studies is a set of *several* crime events where crimes were detected, arrests were made, charges were laid, guilty verdicts reached, and a prison sentence imposed. From these events the crime that brought on the longest sentence was selected for inclusion in the sample. The arrested individuals, on the other hand, were more often arrested for only one specific crime event. In the cases where there was more than one crime category causing the arrest (for instance, break and enter, destruction of property and resisting arrest) the most serious category was used to label the crime event.

In the sample of arrestees, one and the same individual may have been included more than once during a period of 30 days or less, but for different crime events. It is, in other words, possible that one and the same individual was arrested and re-arrested even in the course of the short data collection period. It is very unlikely, however, that this would have any notable effect on the findings.

The same four broad crime categories used in the two inmate sections above yield the distribution of crimes shown in Figure 5.1. This is broken down by sex of the arrestees in Table 5.2.

Figure 5.1 Arrestees in 14 Canadian cities:
Types of crimes of arrest



5.2 The results

There were 334 females among the 1,878 valid cases, i.e., 17.8%. This sub-sample is sufficiently large for most central analyses, and allows us to make separate estimates for male and female arrestees. Table 5.2 shows the distribution of the main types of crimes over the male and female samples

TABLE 5.2 ARRESTEES IN 14 CANADIAN CITIES: TYPES OF CRIMES OF ARREST BY SEX OF ARRESTEE

	N	%
Violent crimes	**338**	**18.8%**
- male	288	16.0
- female	50	2.8
Gainful crimes	**526**	**29.2**
- male	418	23.2
- female	108	6.0
Drug crimes	**243**	**13.5**
- male	191	10.6
- female	52	2.9
Other crimes*	**695**	**38.5**
- male	580	32.1
- female	115	6.4
Total	**1,802**	**100%**

* "Other crimes" consisted of the following crime categories and more general labels: impaired driving, possession of stolen property, breach of probation, damage to property, public mischief, failure to appear, unlawfully at large, family dispute, possession of firearm, breach of court order, etc.

No age limit was imposed for inclusion in the study of arrested individuals for simple logistic reasons. This led to 242 arrestees under the age of 18 (13.2% of the total) being included in the study. Trial analyses were conducted which excluded these under-age cases, but this did not change the results compared to the inclusive sample. The arrestees under age 18 have therefore been included in the results.

5.2.1 Drug and alcohol dependence

The DAST and the ADS scales could not be used for determining dependence on drugs and alcohol in the study of arrestees. Instead, the arresting officer noted if the arrested individual was an "abuser of alcohol" or an "abuser of illicit drugs" (or both).[17] It is clear that differences compared to the other studies may be due in part to differences in the methods and criteria used in assigning dependence/abuse status: scores on validated scales based on self-reports in the inmate studies versus on the spot assessments (although often based on prior knowledge of the arrested person) by a police officer.

TABLE 5.3 ARRESTEES IN 14 CANADIAN CITIES: PROPORTIONS ASSESSED TO BE ABUSERS OF DRUGS OR ALCOHOL BY THE ARRESTING POLICE OFFICER

Assessed to be abuser of…	Males (1,544)	Females (334)	Total (1,878)
alcohol only	25	17	23
drugs only	15	15	15
drugs and alcohol	15	16	16
Not assessed to be abuser	45	53	46
Total	100%	101%	100%

* Based on assessments by the arresting police officer. The questions asked were "Is the arrestee an abuser of alcohol?" and "Is the arrestee an abuser of one or more illicit drug?".

A lower share of female arrestees were assessed to be abusers of alcohol, while the shares of drug abusers and "double abusers" were almost identical between the sexes. Altogether 40% of the male arrestees and 33% of the female were judged to be abusers of alcohol. For drug abuse, the shares were 30% and 31% respectively.

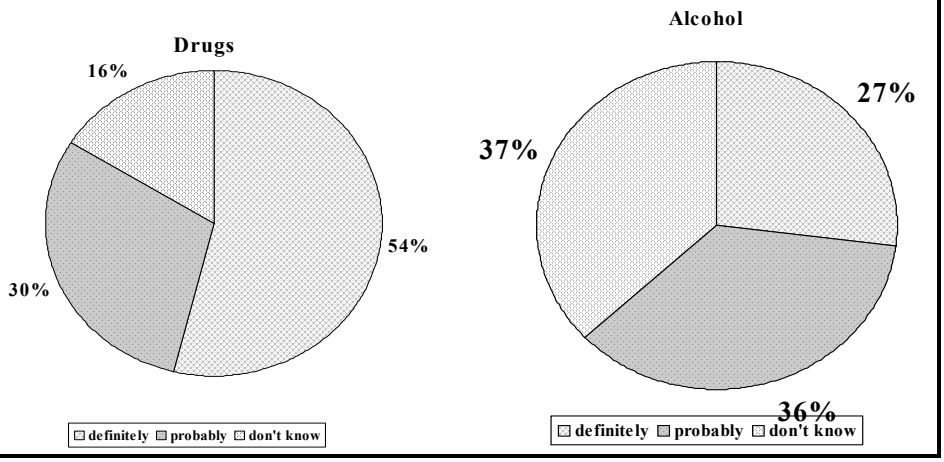
Because the assignment of abuser status is based on the personal judgment of the police officer, it is important to get some indication of the reliability of the judgments as they apply to questions on alcohol and drugs. The assessment of abuser status out in the field seems more difficult in the case of alcohol than drugs (Figure 5.2).

Assessing the drug abuse status of the arrestee was done with more confidence than the assessment of alcohol abuse (Figure 5.2). Fifty-four per cent of the arresting officers offered

[17] In the results presented here we have included all the affirmative assessments of abuse or intoxication, etc. (whether the officer stated that the arrestee 'definitely' or 'probably' was an abuser or intoxicated) into the category of abusers or intoxicated arrestees. Similarly, all cases where the arresting officer stated that the arrestee was not an abuser (intoxicated), regardless whether the assessment was 'definitely' or 'probably', are included in the 'non-abuser' ('not intoxicated') category in the analyses. The 'don't know' responses were included in the negative category, so as not to inflate the prevalence estimates.

categorical statements ("definitely" or "definitely not") with regard to drug abuse, compared to only half that proportion (27%) concerning alcohol abuse. More than twice the number of arresting officers (37% versus 16%) stated that they did not know if the arrested individuals was an abuser of alcohol than made the same judgment in the case of drug abuse.

Figure 5.2 The certainty with which police officers assessed that the arrestee was or was not an abuser of drugs or alcohol



There may be several reasons for judgments regarding alcohol abuse being more difficult: (1) the threshold for abuse of drugs in the community is much lower ("use equals abuse"), and thus any sign of drug use can be used to categorize the person as an abuser, (2) drug "abusers" are more easily labelled by the neighbourhood or location where they are found, and the company they keep, (3) drug "abusers" are more easily/readily categorized on the basis of their general appearance.

The highest proportion of assessed substance abusers are found among the perpetrators of drug crimes, altogether 70% (Table 5.4). Forty-eight per cent of drug offenders were judged to be abusers of drugs only, 16% abusers of both drugs and alcohol and 6% abusers of alcohol only.

The high share of alcohol abusers among "other crimes" (34% + 17%) can be explained by DWI cases being included in this category. The familiar pattern with regard to violent crimes stands up: 26% of those arrested for this type of crime were judged to be pure alcohol abusers, with an additional 16% assessed to be abusers of both types of substances, for a total of 42% alcohol abusers. By comparison, the share of drug abusing perpetrators is relatively small, altogether 21%. Gainful crimes are relatively low in abuser involvement, and almost evenly divided between alcohol and drug abusers.

TABLE 5.4 PROPORTIONS OF DRUG AND ALCOHOL ABUSERS AMONG MALE AND FEMALE ARRESTEES BY TYPE OF CRIME OF ARREST

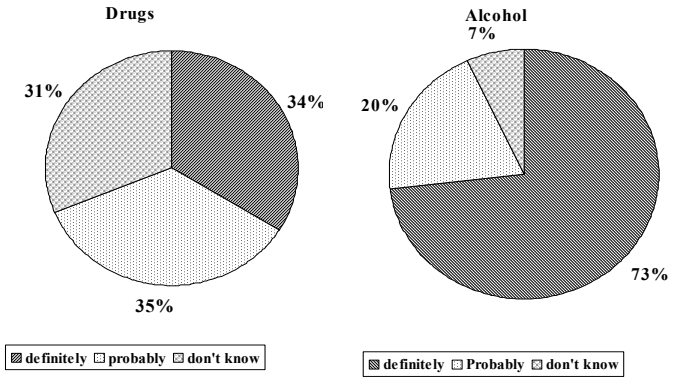
	Drug abuser only	Alcohol abuser only	Drug and alcohol abuser	Not abuser	Total
Violent crime (338)	**5**	**26**	**16**	**53**	100%
- male (288)	6	26	16	52	100%
- female (50)	2	26	10	62	100%
Gainful crime (526)	**15**	**13**	**16**	**56**	100%
- male (418)	16	14	17	53	100%
- female (108)	11	8	12	69	100%
Drug crime (243)	**48**	**6**	**16**	**30**	100%
- male (191)	51	5	13	31	100%
- female (52)	40	8	27	25	100%
Other crime (695)	**10**	**34**	**17**	**39**	100%
- male (580)	9	36	17	38	100%
- female (115)	13	24	17	46	100%
All crimes (1802)	**15**	**23**	**16**	**46**	100%
- males (1477)	15	25	15	45	100%
- females (325)	15	17	16	53	100%

5.2.2 Intoxication

With the information on the arrestee's intoxication at the time of arrest the focus is again on specific crime events. In the cases where there was more than one crime category in the specification of the arrest (for instance, break and enter, destruction of property and resisting arrest) the most serious label was chosen.

Contrary to judgments on abuser status, it is more difficult to assess drug intoxication compared to alcohol intoxication (Figure 5.3). This is shown by the fact that many more arresting officers said they "did not know" if the arrested individual was under the influence of drugs (31%) than said the same for alcohol (7%), and a greater proportion "definitely" in their assessments regarding alcohol (73% versus 34%). Alcohol intoxication has some widely recognized giveaway signs, including smell, that many drugs do not have.

Figure 5.3 The certainty with which police officers assessed that the arrestee was or was not under the influence of drugs or alcohol



The share of arrestees who were judged to be only under the influence of alcohol is considerably higher in the arrestee sample than in the federal study especially, but also in the provincial inmate study. This may to some extent be explained by the relative ease with which alcohol intoxication can be ascertained by another person. On the other hand, it may also reflect in part the true patterns of substance involvement in the arrestee population of Canada. In total 42% of the arrestees were thought to be under the influence of alcohol at the time of arrest, compared to only 18% for illicit drugs (Table 5.5). The substance involvement of women was lower than among men, 44% compared with 53%. This was entirely due to women having been judged as being under the influence of only alcohol less frequently than men.

TABLE 5.5 ARRESTEES IN 14 CANADIAN CITIES: PROPORTIONS ASSESSED TO BE UNDER THE INFLUENCE OF DRUGS OR ALCOHOL AT THE TIME OF THE ARREST

Assessed to be under the influence of …	Males (1,544)	Females (334)	Total (1,878)
alcohol only	35	24	33
drugs only	8	11	9
drugs and alcohol	10	9	9
Neither	47	56	49
Total	100	100	100

Looking again at the four major crime categories we find that being under the influence of alcohol dominates the findings for all categories except drug crimes. The least surprising finding is the very lopsided alcohol involvement among the violent crimes (Table 5.6).

The gainful crimes are also predominantly alcohol-involved, contrary to the pattern found in the inmate samples. It could also be expected that drug crimes would evidence greater drug involvement that the other crimes. This turns out to be the case with altogether 21% being under the influence of drugs only. The total drug involvement in drug offences is 31%, compared to 21% for alcohol. Looking for explanations of the relatively high alcohol involvement, we may surmise that a proportion of "alcohol only" intoxications are actually "alcohol and drug" intoxications, where the drug component is harder to detect. (An additional and more hypothetical explanation would be that signs of alcohol use are used to disguise involvement with drugs by some individuals.)

TABLE 5.6 PROPORTIONS OF ARRESTEES WHO WERE UNDER THE INFLUENCE OF ALCOHOL OR DRUGS AT THE TIME OF ARREST BY SEX OF ARRESTEE

	Under the influence of drugs only	Under the influence of alcohol only	Under the influence of drugs and alcohol	No influence of substances	Total
Violent crime (338)	**4**	**37**	**8**	**51**	**100%**
- male (288)	4	37	8	51	100%
- female (50)	4	40	8	48	100%
Gainful crime (526)	**9**	**17**	**8**	**66**	**100%**
- male (418)	10	18	9	63	100%
- female (108)	9	9	5	77	100%
Drug crime (243)	**21**	**11**	**10**	**58**	**100%**
- male (191)	19	11	10	60	100%
- female (52)	25	12	11	52	100%
Other crime (695)	**6**	**49**	**12**	**33**	**100%**
- male (580)	6	51	12	31	100%
- female (115)	10	36	12	42	100%
All crimes (1,802)	**9**	**33**	**9**	**49**	100%
- males (1,477)	8	35	10	47	100%
- females (325)	11	24	9	56	100%

5.2.3 Alcohol and drugs as incentives for crime

The findings on the proportions of arrestees who committed their crime in order to get alcohol or drugs for personal use are shown in Table 5.7. The results differ little from the corresponding results for the federal and provincial inmates. In more than four-fifths (82%) of the arrestees, getting a substance for personal use was not judged to be a reason for committing the crime. Personal drug use as an incentive dominated over alcohol. Women (20%) were thought to be driven by the drug motive in a greater share of their crimes than were men (15%).

TABLE 5.7 ARRESTEES IN 14 CANADIAN CITIES: PROPORTIONS ASSESSED TO HAVE COMMITTED THE CRIME IN ORDER TO GET ALCOHOL OR DRUGS FOR PERSONAL USE

The crime was assessed to be committed in order to get …	Males (1,544)	Females (334)	Total (1,878)
alcohol for personal use	3	1	2
drugs for personal use	14	18	15
drugs and alcohol for personal use	1	2	1
Neither	82	79	82
Total	100	100	100

Violent crimes and the category of "other crimes" were least likely to have been motivated by acquisition of drugs for own consumption, 9% and 10% respectively (Table 5.8). As can be expected, a great share of drug crimes was committed with own drug use in mind (54%). With gainful crimes this incentive was seen as being active in the perpetrator's mind in one out of five cases.

TABLE 5.8 PROPORTIONS OF ARRESTEES FOR DIFFERENT TYPES OF CRIMES WHO COMMITTED THEIR CRIME IN ORDER TO GET DRUGS OR ALCOHOL FOR PERSONAL USE BY SEX OF ARRESTEE

	In order to get drugs	In order to get alcohol only	In order to get both	To get neither	Total
Violent crime (338)	4	3	2	91	100%
- male (288)	3	3	2	92	100%
- female (50)	8	4	0	88	100%
Gainful crime (526)	17	2	1	80	100%
- male (418)	18	2	1	79	100%
- female (108)	9	1	2	88	100%
Drug crime (243)	54	0	1	45	100%
- male (191)	53	1	1	45	100%
- female (52)	56	0	2	42	100%
Other crime (695)	6	3	1	90	100%
- male (580)	5	4	0	91	100%
- female (115)	14	0	3	83	100%
All crimes (1,802)	15	2	1	82	100%
- males (1,477)	14	3	1	82	100%
- females (325)	18	1	2	79	100%

5.2.4 The involvement of cannabis, cocaine and heroin

The arrestee study questionnaire also included questions on the different types of involvement of the three major types of illicit drugs. Table 5.12 shows that cocaine abuse is judged to be present three times more often than heroin abuse. Approximately the same ratio applies for intoxication and the incentive role of the two substances. Considering that cannabis use is much more common in the general population than is cocaine use, it is noteworthy that the two substances have approximately the same prevalence with regard to the three types of involvement (abuse, intoxication and motivation). Detecting cannabis use may in addition be easier because of the unmistakable smell from smoking the substance.

TABLE 5.9 THREE TYPES OF ARRESTEE INVOLVEMENT WITH CANNABIS, COCAINE AND HEROIN

	Cannabis	Cocaine	Heroin
"Abuser" of the drug			
% of all arrestees	14	12	4
- % of male arrestees	14	12	4
- % female arrestees	11	14	5
Intoxicated from the drug at the time of the crime			
% of all arrestees	8	7	2
- % of male arrestees	8	7	2
- % female arrestees	9	10	3
Crime committed in order to get the drug			
% of all arrestees	7	7	2
- % of male arrestees	7	7	2
- % female arrestees	6	10	2

6. Attributable fractions: Estimates

In this section we will present the method used for calculating attributable fractions for alcohol and illicit drugs in relation to the most serious crime on the inmates' current sentence and crimes of arrest in the 14 Canadian cities. The estimates will be presented at the end of this section. As specified in the aims of our research program, estimates will be made mainly for crimes committed by federal inmates. The samples of crimes committed by provincial inmates contain too few crimes to allow any reliable numerical estimates, but they still provide an indication of how common drug and alcohol determination of crime is in these populations. Because of the difficulties in determining the nature of the psychoactive substance that arrested individuals were involved with, the study of arrestees[18] primarily provides indications of the combined determination by alcohol and drugs. The extent of agreement between the attributable fraction estimates from the different studies and populations will give us an indication of the confidence with which a specified range of estimates can be applied to crime in Canada.

The available data on federal inmates probably provide a relatively good reflection of the situation in the whole of Canada, but the studies of provincial inmates were limited to the province of Québec. With regard to the study of arrests, the communities where police collected information on arrested individuals show a wide geographical spread to different regions of Canada, but the data are based on a convenience sample of locations and police districts and are not a probability sample from all precincts in Canada. Generalizations must therefore be made with great caution. Nevertheless, both the arrestee study and the study of provincial inmates provide the first data of its kind and rough indications of the role of alcohol and illicit drugs in the crimes that are committed in Canada.

The estimates are tentative for another reason. Questions can be raised with regard to validity of the data. This will be discussed in section 8 below. Nonetheless, the prevalence estimates from the different studies that are relevant to the attributable fractions estimates show a relatively high degree of concordance, as we shall see. This provides us with some confidence that the estimates can be used as general estimates for crimes in Canada – at least until larger and more in-depth studies are carried out on all the different criminal populations and their crimes.

6.1 Conceptual background for the calculation of event-based attributable fractions

Any estimation procedure for the contribution of psychoactive substances to crime in a society is based on key conceptual assumptions. These assumptions are founded in part on findings from past empirical research in the field and on the theories that the researcher accepts as providing valid explanations of the association. In this section we discuss three different types of causal models that have been shown by extensive empirical research to explain how alcohol and drugs cause crime. It has not been possible to apply these models

[18] Individuals who were arrested were in some cases only *suspected* of having committed a crime. In some cases it may have turned out that the occurrence was not a criminal act or that the arrested person could not be held legally responsible for the crime.

on Canadian data because relevant data have been missing. Researchers have therefore sometimes refrained from making any estimates of the crime component in the social costs of alcohol and illicit drugs. In other studies, estimates have often been based on questionable conceptual assumptions and deficient empirical data.

The starting point for our calculations are two models that assign different determinant roles to drugs and alcohol in relation to crime: (1) the pharmacological or intoxication model, and (2) the economic-compulsive model. In addition, we have sought information on a third model that may have been relevant for attributable fraction estimates: (3) the illegal system model. This tripartite collection of models is based on a substantial volume of empirical findings from research carried out in several countries. It also coincides with the models used by Goldstein (1985) for classifying drug-related violence.

In sections 3 to 5 above we reported on the different types of substance involvement in crime. These associations will be used in constructing our estimates. However, the definition of systemic crimes created difficulties in the collection of data. More importantly, however, the causal status of these crimes also differs from that of the intoxication and economic-compulsive crimes. There is not the same kind of inner compulsion involved. Many criminals participate in the illegal economy because it is lucrative, and they would commit other types of gainful crimes if the drug trade were not available to them. If they commit their systemic crimes in order to get drugs for personal use, this will be caught by the methods used to define economic-compulsive criminality. If the commission of these crimes was facilitated by drug intoxication this will also be caught. There is no intrinsic connection to drugs in the motivations that incite and causes that drive individuals to commit systemic crimes in the illegal drug trade. It is doubtful that eliminating drugs would prevent those involved in this kind of criminality from crime, and to make them substitute illegal methods with legal ones. On the other hand, intoxication and the addict's efforts to obtain drugs by illegal means when legal avenues are not open would change in a drug and alcohol-free society. It is nevertheless important to try to illuminate the nature of systemic criminality in the drug trade and we will proceed to do so in this discussion. These crimes are clearly associated with illicit drugs (and to some extent with alcohol), but there is not the same kind of causal link.

In addition to these connections between psychoactive substances and crime, some crimes are (4) alcohol-related or drug-related by definition because certain acts have been defined by society as criminal if they involve drugs or alcohol.

6.1.1 The Intoxication model

The intoxication model attributes a direct determinant role to a substance that had been used at the time of a crime. The assumption is that intoxication made, or helped make, the individual commit an illegal act that he/she would not otherwise have committed. In the study of the effects of alcohol, this model is often referred to as a "disinhibition" model. It has been used frequently in various estimations of the role of alcohol on crime, specifically in calculating attributable fractions linked to violent crime (e.g., Adrian, 1988; Stinson and DeBakey, 1992). Because no other information has been available regarding the causal role of alcohol, it has been assumed that all (violent) crimes in which the perpetrator had been drinking were caused by alcohol, i.e., if the perpetrator of the (violent) crime had not been

intoxicated at the time, he/she would not have committed the crime. With one important modification, this model is also used as part of our two-model conceptual frame for estimating attributable fractions for drugs and alcohol on crime.

There are practical difficulties involved in applying this model to real-life criminal events. Even in the cases where it is possible to ascertain that the person who has committed a criminal act was intoxicated, how is it possible to attribute the act to the person's intoxication? The person in question may, for instance, be what Fréchette and LeBlanc (1987) call a persistent delinquent who has committed many other crimes in the past. He/she may have been intoxicated on the day of the crime, but could have repeated the same act the next day without consuming any drugs. This being said, is it entirely right to attribute his/her crimes to intoxication? Isn't it a way of life that the person has adopted and might pursue in the absence of drugs? There is undeniable potential for over-estimating the number of crimes related to drugs or alcohol through determinant processes brought about by intoxication. The critical step in assigning a determinant role to intoxication lies in finding a method that will eliminate the cases where this psycho-physiological state played no determinant role in bringing about criminal behaviour. Our solution is to use the inmates' own assessments of the role of alcohol and drugs in bringing about individual crime events[19].

6.1.2 The Economic-compulsive model

The second determinant model, the *economic-incentive* model, pertains mainly to the role of drugs, and to a lesser extent to alcohol, as motivators in predominantly acquisitive crimes. As has been rather extensively discussed already, substances serve as incentives for individuals to commit a crime so that they will get money or other means for acquiring drugs or alcohol. However, in order to consider the crime as being caused by drugs (or alcohol) as an incentive, and to satisfy the assumption of compulsion (as also proposed by Goldstein, 1985) a condition will be added: the person committing the crime must be dependent on drugs or alcohol. Dependence on drugs or alcohol was determined on the basis of the inmate's score on the DAST and the ADS scales respectively. With this restriction the model is the same as Goldstein's *economic-compulsive* model.

As was evident in the review of the literature presented in the introductory section and from our own data presented in sections 3 to 5, drugs are most often associated with gainful criminality. The economic-compulsive model is based on the observation of a large number of heroin and cocaine addicts as well as crack users. It has also been found that the criminal involvement of addicts varies depending on their level of consumption. Drugs such as heroin, cocaine and, more recently, crack, are perceived to be extremely addictive. Thus, a person who becomes dependent on one of these products has to consume it at regular intervals in a single day in order to avoid physiological or psychological withdrawal. The monetary demand greatly exceeds the revenues generated by a legitimate job (Anglin and Speckart, 19986; Ball *et al.*, 1981; Ball, Shaffer and Nurco, 1983; Johnson *et al.*, 1985; Nurco *et al.*, 1984; Nurco *et al.*, 1988 a, b, c; Speckart and Anglin, 1986).

[19] Alternatives and potential improvements to the method used will be briefly discussed in the last section of this report.

In economic terms, drug addiction is believed to bring on an inelastic demand (Collins, Hubbard and Rachal, 1985) and result in a linear relation between expensive illicit drug consumption and gainful criminal activities (Faupel and Klockars, 1987). Empirical findings point in the direction outlined by Hunt (1991), that the criminal involvement of illicit psychoactive substance users will be in accordance with (a) the user's revenues in relation to the price of the drug; (b) the frequency of drug use as well as the involvement in a drug addict's lifestyle; and (c) a history of delinquency. In our event-based data we focus on the situational motive of the offender and not on characteristics of his/her development. However, as was evident from the results presented above, a large proportion of these events have perpetrators who are dependent on one or more psychoactive substances.

6.1.3 The Systemic model

The systemic model is of great intrinsic interest in the study of crime, but in our conceptual frame not directly relevant for estimating attributable fractions for illicit drugs or alcohol in relation to crime. It concerns crimes that are not intrinsically connected to the drug trade (as are the substance-defined crimes), but that were committed in the course of selling drugs, collecting drug debts, conflicts over drug territory, etc. Neither does it satisfy the criterion of compulsion and its links with illicit drugs are relatively weak because illicit drugs can be substituted with other illegal commodities and illegal markets. Systemic crimes are criminal even if they are not involved with drugs; such as is the case, for instance, with violence whether or not it is related to turf wars or in some other way part of the illegal drug economy.

Drug-defined crimes, for their part, are acts that would not be criminal if they did not specifically deal with drugs. Selling, being in possession of or consuming bread is not illegal: it is not, as we all know, the act of selling, possessing or consuming that is criminal. However, if these acts have some psychoactive drugs as the commodity, the laws of society define them as illegal and the behaviour as criminal. It is the nature of the commodity and not the nature of the act that draws the line between legal and illegal acts. This is different from, for instance, theft where the act itself is criminal independently of what is stolen. Drug-defined crimes can be considered “systemic” crimes, but only in the sense that they occur within an illegal commercial system. However, the primary characteristic of drug-defined crimes is that they are determined to be criminal by drug-specific legislation. True systemic crimes, in the meaning that Goldstein used the concept, are the “excess” crimes of other types that occur because of the illegal nature of the drug trade.

It is not difficult to understand the background of systemic crimes in the drug economy. In a context where quality control is nonexistent, where the consumer has only the dealer's word as to what the product he is buying contains, and finally, where there is no organization to protect the consumer and absolutely no judicial recourse against a dishonest dealer, the law of the jungle easily takes over:

> *Illegal drugs and violence are linked primarily through drug marketing: disputes among rival distributors, arguments and robberies involving buyers and sellers... (Roth, 1994: 1)*

The systemic explanation refers mainly to the aggressive pattern of interactions within a black market:

> *Violence was viewed as an omnipresent possibility, though more likely to involve beatings and stabbings than lethal force. Many respondents bore scars and expressed some anxiety about being hurt, but others felt that if you didn't cheat people and were careful you could avoid injury. (Erickson, 1995: 10)*

In this explanation, violence is almost intrinsic to involvement with trafficking of illicit substances. It includes guarding drug-producing crops, business disputes over territory, enforcement of organizational discipline and normative codes, and also robberies of traffickers usually followed by retaliation, elimination of informers, disputes over drug quality, punishment for selling inferior quality products, punishment for failing to refund debts ("messing up the money"), and so on (Adler, 1985; Fagan and Chin, 1990; Goldstein, 1990; Goldstein *et al.*, 1987; U.S. Department of Justice, 1992):

> *Thus, the only viable alternative to predatory competition may be physical elimination of the competition through threats, intimidation and violence. Violence plays a relatively important role in the utility and profit maximizing calculations of drug market entrepreneurs because nonviolent sources of conflict resolution are not available (Rasmussen, Benson and Sollars, 1993: 221)*

Systemic criminality represents, according to Collins (1990), the most important outcome associated with drug use. This systemic violence tends to occur in (a) socially disorganized areas, which (b) traditionally have high rates of violence, and (c) are economically disadvantaged.

6.1.4 Substance-defined crimes

The third, the substance-defined, component of attributable fractions has already been treated in the discussion above. It is frequently used as an independent measure of attribution in calculations of the social costs of illicit drugs, so that the known prevalence of illegal manufacture, smuggling, sales and possession is taken as a measure of the attributable fraction of drugs on crime. However, this factor and attributable fraction estimates derived from it are not based on causal processes. Instead, it represents a tautological connection of criminal behaviour with alcohol and drug use.

The crimes in this category are included in some attributable fraction estimates on the basis of laws regulating alcohol and drugs in society. Several drug-related offences such as the manufacture, smuggling, trafficking, etc. of drugs are included in the category of drug-defined crimes. Possession and use of most illicit drugs are also defined as criminal acts in many countries and would be covered by this model. (The prevalence of such crimes will greatly depend on the type of lawbreakers studied, with very few cases of mere possession or sale of small amounts of cannabis to be found in Canadian federal prisons.) Because of its special nature, this component will be left out of the present analyses. The advisability of adding this component to attributable fraction estimates will depend on the purpose for which the fraction is used. Mathematically, it is a very simple procedure as will be illustrated below.

6.2 Calculating attributable fractions

It can be expected that there will be some overlap in any population between the positive cases in these models. As we have seen, a proportion of individuals who committed a crime under drug intoxication were also driven by the motive to get drugs for personal use (for instance, so as to prevent their supply from running out). This will have to be taken into account in constructing the attributable fractions in order to avoid double counting and inflating the estimates.

Constructing event-based estimates. Our present data are based on populations of individuals who by definition have committed a crime. This means that there are no units in the sample that could serve as controls in analyses aimed at assigning an explanatory value to independent variables, such as alcohol or drug use. This places restrictions on the type of analyses that can be made.

6.2.1 The intoxication model data

Crime-specific information on drug and alcohol use is available in all five inmate studies for the most serious crime on the inmate's current sentence (the crime with the longest sentence). If the arrested person was suspected of more than one type of crime at the time of arrest, information was sought on the most serious of those crimes. The results of Tables 3.16, 4.6 and 5.5 (intoxication association) and 3.19, 4.9 and 5.7 (economic association) provide part of the background for our event-based calculations of attributable fractions.

TABLE 6.1 UNCORRECTED ASSOCIATIVE FRACTIONS FROM INTOXICATION MODEL (MOST SERIOUS CRIME)

	Federal inmates			**Québec provincial inmates**		**Arrestees in 14 Canadian cities**		
	CSC Canada	FII Ontario	FII Québec	Females	Males	Females	Males	Total
Drugs	.16	.20	.19	.28	.15	.11	.08	.09
Alcohol	.24	.21	.16	.10	.23	.24	.35	.33
Drugs & alcohol	.14	.09	.19	.09	.21	.09	.10	.10
No substance	.46	.50	.47	.53	.41	.56	.47	.48
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

The proportions of inmates and arrestees who were under the influence of a substance when committing the most serious crime are shown in Table 6.1 (the figures are identical to those given in percentage form in the tables mentioned above). They correspond to the one-model estimates of attributable fractions sometimes used in social cost calculations. If one has a restricted focus on the relationship between alcohol and crime one would arrive at a fraction of 0.38 (0.24+0.14) on the basis of the CSC study, and 0.30 on the basis of the FII interviews in Ontario and 0.35 in Québec. For drugs the proportions would be 0.30, 0.29 and 0.38 respectively. The provincial men show a relatively high level of intoxication involvement with alcohol, while the female provincial inmates have the lowest value with 0.19. The possible reasons for the relatively high alcohol involvement (0.43) in the arrestee study and the low drug involvement have been discussed in section 5. The total intoxication involvement in the

crimes of male offenders ranges between 0.50 and 0.59 in the different studies. Among women, the two values are 0.47 and 0.44.

Were we to ask only about the presence of alcohol in crime events that occur in a population, and in a separate investigation ask about illicit drug use in such events, we would be in danger of double counting when estimating the total causal impact on crime from psychoactive substances. In estimates based on information from crime events it is important to make corrections for the share that is associated with both alcohol and illicit drug use.

As was reported in section 3 above, according to the CSC study, cocaine had been used prior to the crime by 8% of the inmates, cannabis by 3%, and heroin by 2% (Table 3.17). In addition, cocaine in combination with alcohol had been used prior to the crime by 4% and cannabis with alcohol by 4%, while the combined use of heroin and alcohol had not occurred prior to the most serious crime.

These figures only show associations and say nothing about the proportion of crimes that would not have occurred if the individual had not been under the influence of the substance. In many cases the intoxication had no effect on whether the crime was committed or not. The question is: How do we determine the proportion that can be attributed to intoxication from alcohol or drugs? The approach tried in these studies was to ask the offender: All the studies included several items asking the inmates to assess the impact of their drug and alcohol use on their criminality and on other aspects of their lives. The individuals who were under the influence of one or more of these substances at the time of the most serious crime were asked directly about the effects of the substance on their feelings and acts at the time. The proportions shown in Table 6.2 said they *would not have committed the crime* if they had not been under the influence.

TABLE 6.2 PROPORTIONS OF INTOXICATION CRIMES ATTRIBUTED TO ALCOHOL AND DRUGS BY THE PERPETRATORS (MOST SERIOUS CRIME)

	Federal inmates			**Québec provincial inmates**		**Arrestees in 14 Canadian cities**	
	CSC Canada	FII Ontario	FII Québec	Females	Males	Females*	Males*
Drugs	.79	.71	.65	.36	.50	N/A	N/A
Alcohol	.81	.68	.73	1.00	.55	N/A	N/A
Drugs and alcohol	.85	.57	.83	.78	.55	N/A	N/A

* This information is not available in the study of arrestees.

Using these data to estimate an intoxication fraction in the determination of a criminal event raises several important questions related to self-report bias and validity of information. They will be discussed in section 8 below.[20]

[20] It may be preferable in future studies to ask a *set* of questions that would delve in more detail into the issue of whether the crime event can, in fact, be attributed to the influence of the substance. In the same way as there are dependence scales, one could perhaps construct an "Intoxication-impact scale". It may be possible to validate such a scale against measures of actual behaviour.

The correction factors differ greatly between the studies. Female provincial inmates attribute only about one-third of their drug-related crimes to having been under the influence of drugs at the time, while the estimate for all male federal inmates in Canada is about four-fifths. The female inmates intoxicated from alcohol ascribe *all* their crime to the substance. The provincial males also provide relatively low estimates for the impact of both substances. However, we must remember that the provincial estimates are based on a very small number of cases. The differences among the federal inmates are not quite as great.

By factoring in the cases where the perpetrators said that they would not have committed the crime if they had not been under the influence of alcohol or drugs respectively, we get estimates of the share of the fractions contributed by the intoxication model (Table 6.3). The all-Canada corrected intoxication fractions for federal inmates for alcohol (0.19) is higher than for drugs (0.13) and the mixed use of alcohol and drugs (0.12) This adds up to a total corrected substance intoxication fraction of 0.44. The estimates from the federal inmate interviews in Ontario and Québec are considerably lower. The provincial inmate estimates are, of course, much less reliable because of the small sample sizes, with the correction bringing down the estimates considerably. The uncorrected estimates from the arrestee study are, not surprisingly, higher than the others for both males and females. (There may be a certain correction built into the method; observed intoxication may be generally detected at higher alcohol and drug levels than the subjective experience of intoxication.)

TABLE 6.3 CORRECTED ATTRIBUTABLE FRACTIONS FROM INTOXICATION MODEL (MOST SERIOUS CRIME)

	Federal inmates			**Québec provincial inmates**		**Arrestees in 14 Canadian cities**		
	CSC Canada	FII Ontario	FII Québec	Females	Males	Females*	Males*	Total*
Drugs	.13	.14	.12	.10	.08	.11	.08	.09
Alcohol	.19	.14	.12	.10	.13	.24	.35	.33
Drugs & alcohol	.12	.05	.16	.07	.12	.09	.10	.10
No substance	.56	.67	.60	.73	.67	.56	.47	.48
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

* No downward correction was applied to the intoxication component in the arrestee study.

6.2.2 The economic-incentive model data

In response to questions on the role of alcohol and drugs as motivators for the most serious crime (*"Was this crime committed to get or while trying to get alcohol/drugs for your own personal use?"*) the proportions of inmates shown in Table 6.4 reported that such was the case. The findings are of course identical to those presented in Tables 3.19, 4.9 and 5.7.

TABLE 6.4 ASSOCIATIVE FRACTIONS FROM ECONOMIC-INCENTIVE MODEL (MOST SERIOUS CRIME)

	Federal inmates			**Québec provincial inmates**		**Arrestees in 14 Canadian cities**		
	CSC Canada	FII Ontario	FII Québec	Females	Males	Females	Males	Total
Drugs	.14	.13	.17	.15	.14	.18	.14	.15
Alcohol	.03	.03	.03	.01	.02	.01	.03	.02
Drugs & alcohol	.07	.04	.07	.02	.05	.02	.01	.01
No substance	.76	.80	.73	.82	.79	.79	.82	.82
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

As discussed in the earlier sections of this report, illicit drugs are greater motivators for crime than is alcohol: 14% of the inmates in the CSC study and 13% and 17% (Ontario and Québec) in the FII study stated that they had committed the most serious crime on the current sentence in order to get drugs for their personal use, while the percentages for alcohol was 3%, in all three samples. The economic substance involvement of provincial prisoners and arrestees fall within the same ranges.

With a starting point in the intoxication model, the importance of the economic factor will depend on the number of cases it adds to those already identified by the former model. The CSC study allows more detailed analyses because of the large number of inmates, and will be used to illustrate this overlap. The additional contribution of the economic factor turns out to be rather modest in this study (Table 6.5).

TABLE 6.5 CSC STUDY: PROPORTION OF PERPETRATORS WHO COMMITTED THE CRIME IN ORDER TO GET ALCOHOL OR DRUGS ACCORDING TO WHETHER THEY WERE ON ALCOHOL OR DRUGS AT THE TIME OF THE CRIME

	On alcohol	**On alcohol and drugs**	**On drugs**	**On neither**
To get alcohol	10.6	3.6	0.3	0.2
To get drugs	1.8	12.8	56.1	1.9
To get drugs & alcohol	6.3	25.4	9.1	0.7
To get neither	81.4	58.3	34.5	97.2
Total	100%	100%	100%	100%

Calculations show that 93% of cases in the combined model from the CSC study were already included in the corrected intoxication model. Consequently, from the point of view of the economic model, there was a great deal of overlap. On the other hand, using the intoxication model as the base shows little overlap, because the combined fraction contains many more cases from this model. The number of drug cases in the CSC data for the whole of Canada rose by 7% compared to the corrected intoxication model, while 4% were added to alcohol cases and 1% to the combined category of drugs and alcohol.

So far we have results that pertain the economic-*incentive* model. In order to combine the corrected intoxication model with the economic-*compulsive* model we need to count in only the perpetrators who were addicted to the substance.

6.2.3 The compulsion correction

Among human beings who are facing a real-life situation, a great many different motivations are typically active at the same time (some of them sub-conscious), and we are at great risk of unnecessary double counting if we do not eliminate some of this complexity of motivation.

One way to do this is to make a selection on the basis of the motivational strength linked to alcohol or drugs by using suitable characteristics of the actors as filters. A suitable filter for sufficient motivational strength for acquiring psychoactive substances is to limit the cases to those individuals who, in addition to reporting that they committed a crime in order to get alcohol or drugs for personal use, were dependent on the substance.

Table 6.6 shows the relationship between dependence status and having committed the most serious crime in order to obtain drugs and alcohol for personal use. The differences between the prevalence estimates for all inmates compared to the sub-sample of those who were dependent are relatively small. The downward correction for alcohol is almost non-existent. A primary explanation for the lack of major differences is that a large proportion of the inmates who reported having committed the most serious crime in order to get a psychoactive substance for personal use were in fact addicts. Although the restriction to addicts did not make much difference for the prevalence figures, it is a conceptually important procedure.

TABLE 6.6 PREVALENCES OF ALL MOST SERIOUS CRIMES THAT WERE COMMITTED IN ORDER TO GET DRUGS/ALCOHOL FOR PERSONAL USE, AND PREVALENCES OF SUCH CRIMES THAT WERE COMMITTED BY DEPENDENT INMATES (OUT OF THE ALL CRIMES)

	Federal inmates			**Québec provincial inmates**		**Arrestees in 14 Canadian cities**		
	CSC Canada	FII Ontario	FII Québec	Females	Males	Females	Males	Total
Drugs								
- all in-order-to-get crimes	.14	.13	.18	.15	.14	.18	.14	.15
- committed by dependent offender in order to get	.11	.11	.15	.13	.10	.16	.13	.13
Alcohol								
- all in-order-to-get crimes	.03	.03	.02	.01	.02	.01	.03	.02
- committed by dependent offender in order to get	.02	.02	.02	.01	.02	.01	.02	.02
Drugs and alcohol								
- all in-order-to get crimes	.07	.04	.07	.02	.05	.02	.01	.01
- committed by dependent offender in order to get	.06	.03	.06	.02	.05	.02	.01	.01
Neither								
- not committed in order to get a substance	.76	.80	.73	.82	.79	.79	.82	.82
- neither in-order-to-get crime nor committed by dependent offender	.81	.84	.77	.84	.83	.81	.84	.84

By including in the causal model only the economic-incentive model cases who were addicted to alcohol and drugs respectively, we have specified the economic-*compulsive* model estimates. In Table 6.7 they have been factored into the corrected intoxication model cases and we have arrived at our final estimates of attributable fractions for most serious crimes in the different samples.

6.3 The final corrected-intoxication/economic-compulsive model

The combination of the corrected intoxication model and the economic-compulsive model gives us the estimates shown in Table 6.7. These are the final attributable fractions arrived at with our methods, empirical material and the chosen two-factor conceptual frame.

TABLE 6.7 THE FINAL ESTIMATES: COMBINED INTOXICATION-ECONOMIC ASSOCIATIVE FRACTIONS WITH ADDICTION CORRECTION

	Federal inmates			**Québec provincial inmates**		**Arrestees in 14 Canadian cities**		
	CSC Canada	FII Ontario	FII Québec	Females	Males	Females*	Males*	Total*
Drugs	.13	.15	.11	.24	.14	.16	.13	.14
Alcohol	.17	.15	.19	.08	.16	.24	.34	.32
Drugs & alcohol	.16	.08	.18	.08	.20	.11	.11	.11
No substance	.54	.62	.52	.60	.50	.49	.42	.43
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

* No downward correction was applied to the intoxication component in the arrestee study.

The small sample sizes in the Québec provincial studies cause us to refrain from making estimates of attributable fractions for this population. The findings for these samples in Table 6.7 are, nevertheless, valuable indications for the general range in which the true fractions for this segment of crimes in Canada are to be found.

The study of arrestees provides findings that are the first of their kind in Canada. It reflects the type of crimes that are found in the community before being processed through the courts. There is every indication that the data were collected in a meticulous manner. The difficulties with observing intoxication from drugs and the lack of the necessary downward correction for the intoxication component make it difficult to accept the figures for that sample at face value.[21] Because of the difficulty in distinguishing alcohol intoxication and mixed intoxication from mere drug intoxication, we have most confidence in the estimate for the joint attributable fraction of 0.57 (0.14+0.32+0.11) for drugs and/or alcohol among all arrestees, the corresponding 0.58 fraction among males and 0.51 among females, although an intoxication correction may bring down these estimates by more than 0.05 points.

On the basis of these findings it is our assessment that the estimate of the attributable fraction for psychoactive substances in relation to relatively serious crimes in Canada is within the following ranges:

For drugs only	**.10 to .15**
For alcohol only	**.15 to .20**
For the combined use of drug and alcohol	**.10 to .20**
For any psychoactive substance	**.40 to .50**

[21] We can speculate about the possibility that subjective assessments of being under the influence of alcohol or drugs have a lower threshold than objective assessments conducted by the arresting officer, and that this would to some extent bring about a downward correction in the arrestee estimates. Lacking empirical data to support this possibility, this remains nothing more than a guess.

As the estimates are based on three different types of offender samples with varying geographical coverage and no possibilities for instituting weighting in order to arrive at one general estimate, it was decided that a relatively wide range would be used, which incorporated the point estimates from the different studies. The estimates are presented as multiples of 0.05 in order to avoid a false impression of exactness. The estimate which probably deserves the greatest confidence is the one for *any* psychoactive substance which ranges between 0.40 and 0.50. Adding the fraction for the combined use of alcohol and drugs to the separate fractions for these substances in order to get a total fraction for alcohol or drugs inevitably leads to double counting.[22] It is nevertheless clear that the separate alcohol-only and drugs-only estimates provide numbers that are too low by not taking into account the mixed use of the substances. The solution as to how to treat the combination category will depend on the purpose for which the estimates are used.

6.4 Attributable fraction estimates from the census of all crimes in a three-year period

The purpose of using the 36-month Calendar instrument was to arrive at samples of crime events that reflected the full volume of crimes committed by a heavily criminalized section of society, without any weighting with regard to the seriousness of the crime and the type or length of sentence that could potentially be imposed. This means that the overwhelming majority of the crimes in the 36-month census were rather petty, such as small-time drug crimes, shoplifting, minor thefts, etc. In an unknown number of cases the events that were reported as crimes by the inmates would not have passed a test in court and would therefore not have been officially labelled as crimes.

Due to the way the Calendar data were collected, the fractions can only be had jointly for alcohol and drugs. Because of the relatively large number of offenders in the sample, the most reliable data available are for the crimes that were committed by the federal inmates interviewed in the FII study. The predominantly undetected and mostly petty crimes of this population had a two-factor attributable fraction for all psychoactive substances of 0.60. This estimate can be compared to the psychoactive substance fraction of the detected most serious crimes in the same sample, which was 0.46. However, the former estimate does not include a downward correction for the intoxication factor, which would reduce its size. Neither does it include an addiction correction, although this would only have a minor influence on the estimate, if we can extrapolate from the findings shown in Table 6.6. With these corrections, the psychoactive substance estimate from the three-year census of crimes may end up relatively close to the serious crime estimate.

To summarize, the totality of crimes committed by the heavily criminalized population of federal inmates seems to be somewhat more substance-determined than are the crimes that were detected and for which they are serving time. However, in addition to the caveats expressed above, we should note that this full volume of crimes consists predominantly of minor crimes and that they would receive a lower weight in a weighted attributable fraction than the "most serious" crimes (see the discussion in the Aims section). A weighting by

[22] Adding up the lower limits of the alcohol only, drugs only and both drugs and alcohol ranges gives us a lower limit of 0.35. The corresponding sum of the upper limits is 0.55. However, this addition is not a legitimate mathematical procedure because the separate ranges are based on different base figures.

seriousness therefore would also help bring down the attributable fraction from the 0.60 level.[23]

6.5 Attributable fractions for four main types of crimes

The CSC study contains data on 8,598 serious crimes, making it large enough for estimations of separate attributable fractions pertaining to the four main categories of crimes used in this report: violent crimes, gainful crimes, drug crimes and the miscellaneous category of "other crimes". The attributable fraction estimates presented in Table 6.8 were arrived at using the same method as for the all-crimes estimates in the preceding subsections. The estimates clearly reflect the associative patterns found for the CSC study and presented in section 3.

TABLE 6.8 CSC DATA: FINAL 2-FACTOR ATTRIBUTABLE FRACTION ESTIMATES FOR 4 MAIN TYPES OF CRIMES (FEDERAL INMATES, CANADA)

	Violent crimes (3,648)	**Gainful crimes (5,586)**	**Drug crimes (1,856)**	**Other crimes (1,314)**	**Total**
Drugs	.05	.20	.16	.06	.13
Alcohol	.28	.11	.02	.35	.17
Drugs & alcohol	.16	.19	.06	.14	.16
No substance	.51	.50	.76	.46	.54
Total	1.00	1.00	1.00	1.00	1.00

Drug crimes show the lowest value on the total attributable fraction, 0.24 (0.16+0.02+0.06) This is in large part due to the types of drug crimes that receive a prison sentence of more than two years. These relatively high-level crimes are not typically committed by drug addicts. The share of alcohol is low, as expected. The total attributable fractions for psychoactive substances are rather similar among the other three types of crimes, 0.49, 0.50 and 0.54. However, while the "pure" drugs fraction is almost double the alcohol fraction among the gainful crimes, the "pure" alcohol fraction is more than five times larger than the corresponding drug fraction in the violent and "other" crime categories. It should also be noted that the combination fraction of alcohol and drugs is sizeable in these three types of crime, ranging between 0.14 and 0.19. The large alcohol fraction in the miscellaneous category can to a considerable extent be explained by DWI crime being included in this

[23] The crimes reported in the Calendar study were overwhelmingly minor drug crimes. According to press reports, the president of the Canadian Police Association, Grant Obst, is of the opinion that police officers in Canada do not put much resources, energy and time into trying to catch those who have one or two "joints" in their pockets (*La Presse* and *Toronto Star*, August 31, 2001). The question can be raised whether petty drug crimes, mainly possession, ought to be included in attributable fraction estimates considering that little effort is expended on detecting and filing charges in these crimes. If the social costs of drug crimes are proportionate to the money and effort expended, using their full volume for attributable fraction estimates among crimes *committed* would greatly over-estimate their contribution to social costs.

The two-model fraction of crimes attributable to all psychoactive drugs actually increases from 0.60 to 0.64 when *leaving out* the drug crimes, indicating that many of these crimes are committed for purely economic reasons without addiction or intoxication being a factor.

category. These crimes make up 235 out of the 1,188 "other" crimes (19.8%) and have an alcohol-only intoxication fraction of over 0.80 (see Table 3.18).

Estimates of attributable fractions pertaining to the four types of crimes can also be had from the three-year crime census of the FII study. The psychoactive substance estimate for violent crime is 0.35 based on the 4,494 crimes of violence committed by the 469 interviewed federal inmates over a three-year period. (The corresponding estimate was 0.49 among the most serious crimes from the CSC study; Table 6.8.) The attributable fraction with respect to gainful crimes is double that, or 0.70, based on a sample of 31,583 crimes (compared to 0.50 in the CSC data). Drug crimes had an attributable fraction of 0.63, based on a sample of 289,598 crimes events (0.24 in the CSC study). Finally, the miscellaneous group of "other crimes" had an attributable fraction of 0.53 (0.54 in the CSC study). These results again underscore the difference between all criminal acts committed and the serious crimes that have passed through all the judicial processes depicted in Figure 2.1.

Estimates for non-drug crimes. It is of some interest to examine what proportion of crimes other than those directly related to drug use and the drug trade can be attributed to addiction and intoxication from drugs and alcohol. Table 6.9 shows the final two-model attributable fraction estimates for the most serious *non-drug crimes* in the different samples studied.

TABLE 6.9 FINAL ESTIMATES FOR ALL **NON-DRUG CRIMES**: COMBINED INTOXICATION&ECONOMIC-COMPULSIVE ATTRIBUTABLE FRACTIONS

	Federal inmates			**Arrestees in 14 Canadian cities**		
	CSC Canada	FII Ontario	FII Québec	Females*	Males*	Total*
N	7,171	205	172	273	1,286	1,559
Drugs	.13	.12	.14	.11	.09	.09
Alcohol	.18	.18	.13	.26	.37	.35
Drugs & alcohol	.16	.13	.17	.10	.11	.11
No substance	.53	.57	.56	.53	43	.45
Total	1.00	1.00	1.00	1.00	1.00	1.00

* No downward correction was applied to the intoxication component in the arrestee study.

There is little difference between this non-drug sample of crimes and the total all-Canada estimates shown in Table 6.7 for federal inmates based on the CSC study, while the separate FII estimates for Ontario and Québec have changed considerably. The changes work in different directions in the two provinces. For instance, the total substance fractions changes from 0.38 to 0.43 in the Ontario region and from 0.48 to 0.44 in the Québec region when drug crimes are left out. Leaving out the drug crimes has little effect on the total substance fraction among the arrestees, with a change from 0.57 to 0.55. The change is mainly due to a decrease in the drug fraction from 0.14 to 0.09. No estimates are presented for the provincial inmate samples because of the remaining small number of cases available when drug crimes are excluded from the sample.

6.6 The systemic component

An alternative three-factor attributable fraction can be estimated by factoring in a systemic crime component linked to the illegal drug market. As was mentioned earlier, it proved difficult both in the inmate interviews and in the arrestee study to come up with a definition that would have clearly distinguished this type of crime from the drug-defined crimes. However, it was possible to make corrected estimates pertaining to the systemic model component in the Arrestee study. The proportion of truly systemic crimes among the most serious crimes of the arrestees was 6%.[24]

As we have pointed out earlier, systemic crimes are not as strongly linked to drugs (or alcohol) as are the intoxication and economic crimes and the definition of causality would have to be expanded considerably in order to include them in the attributable fractions. It is nonetheless intrinsically important to study this component of crimes associated with illicit drugs, and alternative attributable fractions may be calculated which include this component. Many of these crimes are extremely serious and would receive considerable weight in an attributable fraction weighted by seriousness. (There were, for instance, three murders among the 91 systemic crimes in the Arrestee study.)

TABLE 6.10 ARRESTEE STUDY: TWO-FACTOR ATTRIBUTABLE FRACTIONS AND 3-FACTOR ATTRIBUTABLE FRACTIONS (WITH SYSTEMIC COMPONENT INCLUDED) FOR MALE AND AND FEMALE ARRESTEES

	Males		Females		Total	
	2-factor estimate	3-factor estimate	2-factor estimate	3-factor estimate	2-factor estimate	3-factor estimate
Drugs	.13	.15	.16	.17	.14	.15
Alcohol	.34	.34	.24	.23	.32	.32
Drugs and alcohol	.11	.11	.11	.11	.11	.11
Neither	.42	.40	.49	.49	.43	.42
Total	1.00	1.00	1.00	1.00	1.00	1.00

Twenty-seven of the 1,878 crimes (1.4%) for which arrests were made in the 14 Canadian cities were purely systemic, i.e., neither intoxication-induced nor economic-compulsive in nature. The rest, 64 crimes, were already included in the total attributable fraction estimate through the intoxication and economic components. The effects on attributable fraction estimates is therefore rather small, with the total substance fraction increasing from 0.57 to 0.58 in the total sample (Table 6.10). There was no difference in the two estimates among women, while the fraction among men increased from 0.58 to 0.60.

6.7 Substance-defined crimes

In the last stage of attributable fraction estimations for social costing purposes, it is possible to add drug offences as attributable cases to the drug fractions. However, it is, in fact,

[24] A large proportion of systemic crimes probably do not come to the attention of the police. Very few cases of assaults, robberies, extortion, etc. that are linked to the illegal drug economy are reported to the police by victims who are often themselves involved in illegal drug transactions. To the extent that the under-reporting is greater than for non-systemic crimes, the share of systemic crimes will be under-estimated.

preferable to exclude this criterion from the attributable fraction calculations for several conceptual reasons. The two models used in our estimates are examples of event-based causal determination (the term "causal" being used in the broad sense common to the social sciences), either in the form of natural biological processes (intoxication model) or goal-directedness based on the psychological incentive value of the substance and, in some cases no doubt, based on biological changes brought about by substance abuse (the economic-compulsive model). The systemic link is of a different nature and so is the substance-defined category of crimes. They are largely based on societal reactions to use, sales, manufacture etc. of the substances (substance-defined crimes) or stem from the same societal reactions in helping to create an illegal economy (the systemic crimes). *A distinction could indeed be made between "causal" attribution fractions, which we have presented above and which are based on the intoxication and economic compulsive models (as are our two-factor estimates), and the "social" attribution fractions that are based on the definitional and systemic components.*

Under the common definition of attributable fractions, also known as " etiologic " or "causal " fractions, the crime event must be *caused* by the use of one or more drugs in order to be attributed to drug use (e.g., Northridge, 1995). If a drug crime such as possession or trafficking is caused by the drug intoxication of the offender or a drug dependent offender's wish to procure drugs for personal use, that drug crime event can be attributed to drugs in the same way as other types of crimes are also attributed to drugs. The rest of the drug crime events in the population are only instances of drug-defined crimes (if we leave the systemic component out of consideration). The drug use does *not cause these crime events*, even though the drug use *causes the legal sanction*.

It was stated above that it is a relatively easy task to include a drug-defined crime component in the total attributable fraction if one so wishes. For the purpose of illustration, we can do so using the CSC data. There were 1,856 drug crimes among the 12,404 crime events in that study (weighted figures). Out of these crimes, 445 (24%) were attributed to the two causal factors (intoxication and economic compulsion). The rest, or 1,411, will be added to the cases in the total attributable fraction calculation. This means that the total substance (alcohol and drugs) fraction will increase by 1,411 over 12,404 or 0.11 for the most serious crimes of the CSC study. This will, in other words increase from 0.46 to 0.57. Dividing up the 0.11 fraction between the "drugs only and " alcohol and drugs " categories will require a little bit more work, but the principle is the same.

7. Discussion I: The nature of attributable fractions

Although the definition of attributable fractions, also known as "etiologic" fractions and "causal" fractions, is based on a simple enumeration of events or cases, the logic of event-based estimation methods does not seem to have been clearly worked out in any detail (Greenland and Robins, 1988). Attributable fractions are meant to show, for example, the proportion of violent crimes that were in some way caused by alcohol. In order to arrive at this measure, we count (1) all the cases of violent crime in a population and (2) the cases caused by alcohol, and (3) calculate the value of the fraction (2) over (1).

Assuming that we have estimated valid attributable fractions for drugs and alcohol on crime, what is the range of their applicability? In other words, even if drug and alcohol use and abuse stay the same, how do changes in other factors impact on the attributable fractions for alcohol. This is the first of two questions that will be addressed in this section. The second related question concerns the problem of double counting, which is always present with event-based measures.

Although the idea is simple, the actual calculation of attributable fractions can be very complicated, and uncertainties often remain with regard to the conceptual and methodological soundness of the estimates and their accuracy. The nature of these fractions and their legitimacy as estimates of truly *causal* influence is not entirely clear. The meaning of the concept of "cause" in and of itself, and how to establish that A is a cause of B, is a central topic both in the philosophy of science and in textbooks on methodology and statistics. Several of the distinctions developed in these treatises are relevant to understanding the nature of different kinds of measures that are included under the attributable fraction label.

While attributable fractions are mainly based on standard methods using *statistical co-variation* as a starting point, other alternatives are based on *in-the-event causal modelling,* where situations are classified as being either cases or non-cases on the determinant variable (for example, being caused by alcohol intoxication). There is also a third type of method that could be called *person-based modelling,* which relies on the classification of individuals into causal and non-causal cases. A rough description of the different approaches follows:

1. Co-variation is the basis for most common statistical methods that assess the size of associations between one or more independent factors and a dependent factor. The more closely variations in the independent factor (e.g., alcohol use) are linked to variations in the dependent factor (e.g., violent crime) the stronger the association. One can, for example, study how violent crime rates vary over geographical regions in relation to the volume of alcohol consumed in that region. One can also study this type of co-variation within one region by relating changes in volumes of alcohol consumed over time to changes in crime rates. Methods have been devised which provide numerical estimates of the share of, e.g., violent crime rates that can be said to be caused by alcohol consumption by using such time-series analyses. These have been used mainly in Scandinavian studies.

2. Event-based causal modelling has been used in making estimates of attributable fractions. The fractions arrived at by this method differ in important ways from the

estimates that use co-variation methods. In fact, the methods differ so radically that event-based fractions (or at least the type that has been used to date) perhaps ought not share a common label with estimates from co-variation methods. The event-based modelling is still in an embryonic state and the conceptual basis has not been worked out in any detail. In estimating hospital costs and loss of income from alcohol-related violence, for instance, some investigators have used estimates of the proportion of events in which the perpetrator had been drinking prior to the violent incident as the attributable fraction for alcohol. As we have seen, the intoxication model used in this report is based on this event-based estimation, but with a correction factor for causal influence.

3. Person-based estimation would occur when a crime event is designated as being caused by a drug or alcohol if the perpetrator has certain characteristic. The most natural example of such a characteristic in the present context is being addicted to (or being "dependent on") a substance. (This model was used in constructing the economic-compulsive component of our attributable fraction estimations.) Thus, if we have information on what crimes were committed by those addicted to cocaine we would count them among the crimes that were caused by cocaine. Some corrections or reduction factors may be needed for taking into account criminality during the periods when the individual was not addicted to any substance. This person-based method may be used within the same study for comparison with estimates from event-based modelling. We found that the addiction restriction on the economic component of our two-factor estimates had a negligible effect on the partial attributable fraction that had used a modified intoxication model as the first stage of the estimation process.

7.1 Elimination fractions, interactions between causal factors and potential double counting

The idea of a society that is free of illicit drug and alcohol use or abuse is often used as a counterfactual scenario in social cost estimates. It is customary to assume in these estimates that *no causal factor that is not linked to the use of alcohol or drugs will have changed when the substance is eliminated.* The closest one can get to such total elimination scenarios in the real world is through the natural experiments that were mentioned in the introductory section of this report; that is, when the availability of alcohol or drugs is drastically decreased or increased within a short period of time. The logic of elimination fractions is closely tied to such situations and to the concept of an alcohol- or drug-free society.

For the sake of simplicity, let us only consider the causal impact of the alcohol intoxication model on violent crime, and leave out of consideration the economic-compulsive contributions and systemic contributions. (The systemic and economic-compulsive processes would in any case have little influence in the case of alcohol.) In addition to alcohol intoxication, we will assume that unemployment is causally related to violent crime in our population of interest.[25]

Let us use the symbol A for the set of situations where alcohol intoxication occurs in the population, and the symbol U for the set of situations where unemployment is present. The set of situations in which both are present would be the intersection of the two sets: A^U. For negation we use the symbol "n". The symbol nA then stands for the set of situations where alcohol intoxication is not present, and nU for the set of situations where

[25] Unemployment has been shown to be directly related to certain forms of criminality in some populations.

unemployment is not present. Using these symbols we can describe the total state of affairs in the population with regard to alcohol intoxication and unemployment: This is equal to A^U + A^nU + nA^U + nA^nU = 1.00. For illustrative purposes, let us say that the prevalence distribution of these situations in the population under study is the following:

A^U	10%
A^nU	20%
nA^U	30%
nA^nU	40%
Total	100%

In other words, 40% of the relevant situations in this population are such that the participants are neither intoxicated from alcohol nor unemployed, 30% are cases of no alcohol intoxication, but with unemployed people participating, etc. Adding up, we find that situations with individuals participating who are intoxicated from alcohol form 30% of all situations (A^U + A^nU) and that situations with unemployed people participating form 40% of all situations (A^U + nA^U). A very problematic population, indeed, but perhaps possible to find in some ghettos of large cities and among some disenfranchised minority groups.

From here we can go on and, for the purpose of illustration, arbitrarily assign probabilities for violent crime occurring in the different situations:

A^U	.40
A^nU	.20
nA^U	.10
nA^nU	.05

The situations with the highest risk of violent crime would then be those where unemployed people are under the influence of alcohol: 40% of these end up in a violent crime. By contrast the situations where sober and employed people participate would have a risk of 5% that a violent crime will occur.

We can now calculate the risk that a violent crime that occurred in the population would have occurred in the four different situations. This depends on how common the individual situation is and what the risk is that a violent crime will occur in that situation. The calculation is simply done by multiplying the prevalence fraction with the risk fraction:

A^U	.10 x .40 = .04
A^nU	.20 x .20 = .04
nA^U	.30 x .10 = .03
nA^nU	.40 x .05 = .02

Summing the products, we find that the risk of a violent crime occurring in any situation in this population is 13% (or 0.13). In addition we can see that 8% (0.04+0.04 = 0.08) of all

violent crime situations have a drunken participant, while 5% (0.02+0.03) have a sober participant committing a violent crime[26].

Eliminating unemployment. Now we have all the tools needed for illustrating the nature of the elimination fraction. We have seen that the probability that a violent crime will occur has its highest value when both intoxicated and unemployed people participate, and its lowest value in situations where people are sober and employed. Now, what happens if there is a change to full employment in this population, i.e., unemployment is eliminated? In this case the A^U situations would change into A^nU situations, and their share would increase to 10%+20%=30%. In addition, the nA^U situations would change into nA^nU situations and their share would increase to 30%+40%=70%.

The total risk of violence in this population with no unemployment can again be calculated by taking into account the prevalence of the two situations and the risk of violence in these:

A^nU	0.30 x 0.20 = 0.06
nA^nU	0.70 x 0.05 = 0.035

With the elimination of unemployment, the risk of a violent crime occurring at any time in this population has been reduced from 0.13 to 0.095 (0.06+0.035). By eliminating unemployment we have therefore decreased the rate of violent crimes by 3.5 percentage points or by 3.5/13 =27%. The elimination fraction for unemployment in this population is therefore 0.27.

Eliminating alcohol intoxication. Let us now see what would happen if alcohol intoxication were eliminated in this population, while the rate of unemployment remained unchanged. The A^U cases will then become nA^U cases and the A^nU cases will turn into nA^nU cases. We get the following prevalence x risk calculation:

nA^U	0.40 x 0.10 = 0.04
nA^nU	0.60 x 0.05 = 0.03

The proportion of situations that will produce a violent crime has now been reduced from 13% to 7% (0.04+0.03), a reduction of 6/13=46%. The elimination fraction for alcohol is therefore 0.46. This can be compared to the elimination fraction for unemployment, which was 0.27

Potential double counting. Of central interest here is the share of the violent crimes that is potentially subject to double counting. The easiest way of calculating this share is to compare the two separate elimination scenarios above to what happens when *both* unemployment situations and alcohol intoxication situations are eliminated at the same time. In the latter scenario we will end up with 100% of the cases in the nA^nU situation, and the remaining attributable fraction for this default situation will be 0.05 x 1.00 = 0.05. The decrease in the attributable fraction will therefore be 0.13 - 0.05 = 0.08.

[26] We can also calculate the proportion of intoxicated offenders in the violent crimes of this population: 0.08/(0.08+0.05)=0.62 or 62%. This approximate figure is fairly commonly found in the literature on violent crimes.

Adding up the decreases when either alcohol intoxication and unemployment were separately eliminated we get 0.035 + 0.06 = 0.095. Double counting would in other words have led to an over-estimate of the attributable fraction by 0.095-0.08= 0.015 or 19%. The more causal factors there are, the higher the likelihood of double counting and over-estimation if the elimination fraction is used as an estimate of the standard attributable fraction for unemployment and alcohol intoxication. The elimination fraction is nonetheless useful in itself, and often used interchangeably with other types of attributable fractions.

As elimination fractions, the separate results for unemployment and alcohol intoxication stand unchallenged, and if we conducted a natural experiment eliminating all alcohol intoxication in this population we would (in theory) reduce violent crime by 46%. If we, on the other hand, eliminated unemployment, the reduction in the rate of violent crime would be 27% Because of the conditional or interactive relationship between unemployment and alcohol intoxication in causing violent crime, we would not reduce it by 73% (46%+27%) when we eliminated both, but by 62% (0.08/0.13). If we first eliminated alcohol intoxication we would get a reduction of 46%, and if we in this new situation eliminated unemployment we would get an additional reduction from 0.07 to 0.05 or 29% from the new, intoxication-free, level. Based on the original situation in the population this full employment reduction would only be 15%.

If the attributable fractions for alcohol intoxication and unemployment were independent of each other, the sum of the decreases in the elimination fractions when the two factors were eliminated separately would add up to the decrease in the fraction when they were eliminated simultaneously. However, in our illustration, and no doubt in real life, there is a certain conditionality built into these figures in that the risk of a violent crime occurring is higher when both (the stresses of) unemployment and alcohol are present in a situation than when either alone is present.

As opposed to event-based elimination fractions, co-variation-based measures are standardized and have a built in safeguard for adding up the causal contributions from various factors, so that the total of the fractions always add up to unity. If we include measures of poverty, broken families, disintegration neighbourhoods, opportunity structure and the average level of substance use in the area using a standard co-variation formula, we can rest assured that the attributable fractions for these separate factors will not add up to more than 1.00. This is not the case with event-based measures.

Standardized fractions and elimination fractions. The co-variation approach, such as a time series analysis, is superior from a costing point of view because it can use methods that set the sum of all fractions to a standard 1.00. This means that it can directly provide relative estimates of causal impact for the different determinant factors in relation to each other. Such standardized attributable fractions are useful for some analytical tasks and elimination fractions for others. They can be calculated from different types of data sets. In the very unlikely situation that there is no interaction between various causal factors the standard attributable fraction for a causal factor would be identical to its elimination fraction. A central question is whether there is any way of getting from an elimination fraction to a standard attributable fraction by eliminating the double counting that will almost inevitably occur when using the former estimates.

Estimates using the co-variation method are often interpreted as if they provided elimination fractions. This is not strictly correct, however, because co-variation methods, at least to the extent that they use fractions that must add up to unity (1.00), do not take into account conditional relationships between independent variables in generating cases of crimes or illnesses, etc. When a risk factor such as illicit drug use is eliminated, a certain percentage of conditionally related cases will also be eliminated. The same cases can be eliminated by getting rid of these other conditional factors. Attributable fractions from "unity-bound" measures do not take into consideration the eliminated cases that would come about through elimination of any one of several other factors that must, in many cases, necessarily be present for a crime or illness to occur.

There are, therefore, both advantages and disadvantages to using elimination fractions based on samples of crime *events*. In the end such fractions will lead to a more realistic estimation of what will occur when a causal factor is eliminated or reduced in a society. On the other hand, there is the problem of double counting, which will make these estimates unsuitable for many costing purposes[27].

A remaining problem: purposeful use of psychoactive substances. What is common to both the "would-not-have-committed-the crime-if …" and the addiction corrections that have been used in estimating attributable fractions in this report is that they look for a compulsive, at least in part biological, causal process where the actor "just could not help himself (herself)." This condition was relatively easily defined with regard to the economic model by taking into account as true cases only those individuals who were addicted to the substance.

Questions can still be raised with regard to the causal role of intoxication. It is questionable if cases occurring from the rational use of a substance (see discussion of theories in the introductory section) should be causally attributed *to the substance*. If, for instance, an individual drinks alcohol because he knows that it helps him go look for a fight or to work up the courage to commit a burglary, can one really say that alcohol was a cause of the crime?[28] Even in the cases that come about through this planned use of drug or alcohol effects, it is true that availability of any tool (and here we have to look upon the substance as a tool more than a causal agent) will increase the chances of it being used for any purpose. Neither the event-based modelling nor the current co-variation methods can distinguish such occurrences from those truly causal ones (i.e., those that came about by some form of inner substance-initiated compulsion without prior planning). Ideally, these intoxication cases should probably be distinguished from the cases that were more clearly determined by intoxication in an unplanned manner. The question asked from our inmate samples, "Would you have committed this crime if you had not been drinking (using drugs)?" does not help distinguish between rationally planned and truly causal cases. To the

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27 If we had some way of limiting the possible causes to only one, e.g., by having knowledge of what the *primary* cause of a crime event was, it would be possible to design estimation methods based on causal attributions to individual events with the sum of the fractions not exceeding 1.00. Using several independent measures is preferable to relying on only one. It is to be hoped that estimation methods for the impact of psychoactive substances on crime will be developed with more mutual input from different approaches on both conceptual and methodological issues.

28 The same kind of conceptual conflict is evident when the NRA (National Rifle Association in the U.S.) states that "guns don't kill people, criminals do", while proponents of gun control stress the importance of availability in causing violent crime.

extent that the pre-planned cases ought to be left out for conceptual reasons there is no way of doing so with these types of data.

7.2 Comparison with aggregate level analyses

The ideal type of study that would allow a flawless estimation of attributable fractions may be easily specified in theory, but, at the present time at least, impossible to conduct in practice. The choice is between methods that are all lacking in some respects. The choice depends primarily on the data available for the purpose and the modelling preferences of the researcher.

Different types of time series analyses are potentially the most powerful methods available for aggregate level estimates. However, we have to remember that although time series methods – using, on the one hand, statistics on annual consumption of a psychoactive substance and, on the other, crime rates in the same population – are possible in the study of the relationship between *alcohol* consumption and crimes, it is not possible in the case of illicit drugs, because statistical data are simply not available. Some type of individual level data that are specifically collected for the estimation of incidence, prevalence and explanation of patterns must be used in the case of drugs. The only relevant, detailed and even potentially valid data must be obtained from individuals who participated in crime episodes. We are, therefore, faced with the same validity concerns that must be raised in connection with our inmate studies and any other studies that use self-reports for collection of data.

Establishing causality is naturally a key element in the estimation of attributable fractions. The method used here has taken its starting point in a set of causal models which specify the processes by which the use and abuse of alcohol and drugs become linked with crime. Although approaching the question from different conceptual extremes and by different methods, the method using additive causal models based on crime events and the aggregate co-variation method in principle measures the same reality and aims at getting the same estimates of attributable fractions. Under ideal circumstances they should therefore arrive at the same numerical estimates in a population. An interesting question is how similar attributable fractions for alcohol from, for instance, time series analyses are to attributable fractions for alcohol based on self-reports on individual crime events. Such comparisons would be possible for a number of countries or other jurisdictions, but only for alcohol. It must be a central aim in the estimation of attributable fractions, and in understanding the causal processes involved, to arrive at a stage where the aggregate and individual level estimates converge.

One advantage of using event-based data for estimation is that it makes it possible to distinguish individual cases from non-cases on attributable fraction *variables*; a crime event is either a positive case on the intoxication variable or not, and the same dichotomy applies to the economic-compulsive variable. This means that attributable fractions can very easily be arrived at for different types of crimes, for different subgroups of offenders, etc. For instance, given a large enough sample of perpetrators or crime events, one can easily get estimates of what proportion of violent crimes among perpetrators under 30 years of age were attributable to alcohol or drugs. Similar analyses from co-variation studies would require much more inferential measures and more cumbersome methods of estimation. An

event-based method will also make it possible to relate the contributions of the different causal models to each other. It will enable us, for instance, to monitor the relative importance of intoxication and economic incentive (in addition to systemic influences and the effects of legislative changes) over time and in different populations.

8. Discussion II: Validity concerns

The methods used in our studies may lead to an over-estimation of the role of alcohol and drugs. This could happen because of the human tendency to blame outside agents, in this case alcohol and drugs, for infractions committed. It is also possible that not all causal influences of illicit drugs and alcohol are covered in the two situational models (intoxication and economic incentive) that we have used. This would lead to an under-estimation of the determinant role of the use and abuse of psychoactive substances.

8.1 What could be missing?

8.1.1 Long-term effects

Since the models used here are in essence situational, being based on crime events, long-term influences are only covered to the extent that they determine situational patterns of behaviour without any residue of direct effects on the risk of committing crimes. Addiction, independent of situational substance use, could have this kind of effect. But there are other possible long-term causal pathways in addition to addiction. *Former* drug or alcohol use can, for instance, contribute to the lack of employment or a low income, which may again drive the individual to commit crimes even when he/she has stopped using the substance.

More generally, the causal influence that long-term substance abuse plays in the emergence of individuals and situations that are at high risk of crime is not specifically covered in the models. Some such situations come about whether the perpetrator was intoxicated at the time of the crime or not. Time-lagged effects of psychoactive substance use are selectively covered also in the economic model to the extent that they are expressed as an elevated risk of (1) wanting psychoactive substances and, at the same time, (2) not having the legal means to procure them. Judging from a considerable overlap between the attributable fraction cases and the dependent status of the perpetrator in the CSC and FII studies (results not shown), independent time-lagged effects that are not reflected in addiction at the time of the crime are not of great importance. Instead, such effects seem to be largely covered by our two-factor attributable fraction estimates. However, this question needs further study. To the extent that such longer-term effects are not covered, the present estimates would of course under-estimate the true fractions.

8.1.2 Additional situational dynamics

Our perpetrator-based intoxication model leaves out some causal roles that intoxication can play in a crime situation. Robberies are sometimes carried out by sober perpetrators on victims who have been drinking or using drugs (often because of their incapacitation), and some violent crimes are precipitated by an intoxicated victim. However, research findings indicate that assaults where only the victim had been drinking are relatively rare compared to incidents in which both participants or only the person designated as the offender had used alcohol prior to the event (e.g., Pernanen, 1991). To the extent that such situational factors are not covered "by proxy" by the models used in the estimates, they would also for this reason provide under-estimates of the true attributable fractions.

8.2 Questioning the validity of the self-reports

The greatest drawback of individual level data on substance use and crime is that they must be collected by special studies. Much of the information has to be based on self-reports, and it is known that self-reports can be unreliable. The questions generally concern past behaviour with a risk for memory lapses. In the case of sensitive information, social desirability may affect the validity of the information given. Above we have discussed some circumstances that may underestimate attributable fractions related to illicit drugs and alcohol. There are well known counteractive tendencies toward over-estimation of the role of alcohol and drugs in causing crime.

Validity issues are central in the study of sensitive areas of behaviour, of which illicit drug use and crime are extreme examples. Self-reports on such topics are usually thought to provide under-estimates in general population studies. However, this may not be true in populations of drug users or prison inmates. These are questions that can only be answered by further empirical research.

In assessing the aggregate validity of information provided by respondents, it is customary to focus on three potential sources of bias: (1) biased samples, (2) forgetting, and (3) deliberate misrepresentation or lying.

8.2.1 The possibility of biased samples

The CSC data were intended to be a census of all inmates in Canadian penitentiaries for the period 1993-95. A full census was not achieved because of missing data from some penitentiaries. Weighting procedures were instituted in order to correct for these omissions. In addition, the findings in section 3 showed that estimates from the FII samples did not differ much from the CSC study results, despite a three to six-year difference in the period of study and different methods of data collection being used. This provides strengthened confidence in the reliability of the findings, which is a prerequisite for their validity.

Similar reliability checks between studies are not possible for the provincial prison inmate studies and the study of arrestees in 14 Canadian cities. In addition, the sampling in the provincial studies leaves a great deal open for biasing influences: the studies of inmates were restricted to one facility for women and one for men, with local influences potentially having free play. In the study of arrestees in 14 cities there was a rather uneven geographical coverage of cities with a population of 100,000 or more. Despite the fact that the findings from these three studies can be questioned on several counts, they perform a valuable role in providing rough estimates of what can be found in the field. They also serve as pilots for any future attempts at accessing relevant information from populations which have scarcely been studied at all in the past. Most importantly, they have yielded estimates that show considerable concordance on important measures with the studies of federal inmates.

8.2.2 Self-reports: Forgetting

The likelihood of forgetting is smaller the higher the saliency of the events reported on. The crimes asked about in the CLAI part of the inmate studies were serious enough to warrant a long prison sentence. The circumstances of the crime have been repeatedly brought back in the mind of the perpetrators in connection with the arrest, interrogations, legal counselling, court procedures, psychological assessments, etc. With the studies being done on new inmates (in the arrestee study based on direct situational observation) the crime event will in most cases not have occurred in the distant past. The influence of forgetting is therefore probably not very strong on the variables used in the analyses of the most serious crime samples. With the total census of crime events attempted in the Calendar part of the inmate studies, we are naturally faced with a different situation. It would have been extremely unrealistic to expect the inmates to report on all crime events during this period. Some recent crime events were vividly remembered and reported on, but for the most part what was achieved were the inmates' assessments of the level of criminality and drug and alcohol use during specific periods. Drug and alcohol use patterns among inmates are also made up of series of events that are fairly central in the lives of the high proportion of inmates who use these substances, and may therefore be relatively resistant to memory loss.[29]

8.2.3 Self-reports: Lying

The risk of deliberate misrepresentation of facts depends on the subject about which information is sought. Social desirability and personal status are key factors: over-reporting has been found in surveys of income, education, charitable donations and the like. Under-reporting also often has its roots in social desirability and avoidance of social stigma. Acts and circumstances that are met with disapproval are not reported validly by some respondents.

Alcohol use surveys regularly under-estimate the total alcohol consumption in a country or region. Although the sampling frames used do not often include a representative share of high consumers, and forgetting is a factor, it is generally believed that conscious under-reporting is also a major factor in the resulting under-estimation of alcohol use. Information on drug use is even more prone to under-reporting in general populations, especially in jurisdictions where use and possession are criminalized.

There are other potential threats to the validity of self-reports in the special populations that are the subject of our research:

> *Drug addicts often are delinquents but just as often victims of violent crimes. They have a very high victim tolerance. They do not denounce one another for fear, habit and self-protection... Thus delinquency inside the scene remains almost completely within the dark figure (Kreuzer, 1993: 78).*

Confidentiality is strongly stressed in most studies of criminals and substance abusers. This was also done in our interviews with inmates and no identifying information was entered in

[29] Forgetting usually means a higher risk of under-estimations, although sometimes forgetting *when* an event occurred can lead to "telescoping" into a reference period and a risk of over-estimation. This possibility is naturally more relevant to the set of crime events over the three-year period covered with the Calendar instrument. This factor is hardly of much consequence in the data.

the research files. The general impression of the interviewers in penitentiaries and prisons was that inmates were in most cases not trying to consciously hide their involvement with drugs or criminal activities. (This is also evident from the great number of crime events reported.) The fact that they were in a setting removed from the dangers of street life may have contributed to an increase in openness.

Some of the validity issues in the studies presented here are the same as in general population studies. However, there may in fact be a higher risk of under-reporting with regard to drug and alcohol use in general populations than in populations of deviant individuals, especially among those who are already known to be substance abusers. There is little incentive to tell the truth about drug use and other illegal activities among people in general who are not known to be (ab)users.

Inmate populations have already been labelled as deviant. In many cases, they have been confronted with and have themselves told about their drug and alcohol use and their criminality in various situations. There is simply little to hide. There are also incentives for not concealing drug and alcohol use and problems linked to this use. Some inmates genuinely want to end their dependence on drugs or alcohol. In some cases they want to spend at least part of their prison time in a treatment environment which in many cases is more pleasant than a standard prison setting. In such cases they are well served by reporting on their drug and alcohol problems. On the other hand, the possibility of diversion into treatment naturally also increases the risk of *over*-reporting the use and abuse of alcohol and drugs.

Some validity evidence from the Calendar data. One observation from the calendar part of the inmate interviews does not readily fit into the assumption that the inmates were governed by social desirability considerations. When filling in information on the calendar together with the interviewer, the inmates were asked to report on the crimes they had committed during the 36 months prior to their arrest. To limit our illustration to federal inmates, crime events in the tens of thousands were reported in the FII study by the 469 inmates interviewed, with several crimes often being committed in the course of one day.
In the great majority of cases the inmate was never suspected, arrested, charged or sentenced for the crime. This shows a great willingness to trust the interviewer with information that would seem to be socially undesirable and even potentially damaging for the individual.

A great proportion of the crimes reported in the 36-month calendar were committed under intoxication from illicit drugs or alcohol. A possibility is that inmates wanted to shirk responsibility and blame alcohol or drugs for their acts, which would have led to an over-estimation of the role of these substances. If we accept this assumption, we also accept a certain twisted logic (although such logic is not at all unknown in the determination of human behaviour): The inmates confess to a great number of crimes (either because they are honest or want to brag), and they report a high involvement of substances (because they do not want to take responsibility for their acts and want to appear in a better light). Now, why would an inmate confess to a great number of crimes in the first place if he/she wants to project a socially desirable image? By reporting only the crimes for which they have been sentenced or which they have confessed to, and blame intoxication for these crimes, they would surely meet the social desirability requirements better. By reporting on as few crimes

as possible they could rationalize the crimes as rare occurrences when they were innocently overwhelmed by the effects of a drug or alcohol. By confessing to a great number of crimes they cannot as easily escape responsibility; they must confront the question "Surely, you noticed that taking these drugs or drinking these amounts of alcohol led to you committing criminal acts. Why didn't you stop?" Nonetheless, we can expect great individual variation among inmates both with regard to honesty, acceptance of responsibility and other relevant factors.

8.3 Questioning key validity assumptions related to the attributable fractions

The reliability of the information given by the federal inmates has stood up relatively well under the two different data collection methods. However, three central validity issues remain with regard to the intoxication model and the economic model of the CSC, FII and PII studies.

8.3.1 Validity of assessments about being under the influence of drugs or alcohol

Self-reports on level of intoxication in connection with deviant behaviour have been used in numerous general population surveys around the world, although definitions of intoxication differ between cultures. On the whole, the experience is that the data obtained are sufficiently valid for generalizations on the prevalence of substance-linked deviant behaviour and for most other analytical purposes. Emergency room studies also indicate that self-reports yield valid data on alcohol use in connection with the injury, whether from violence or accidents. Self-reports on drinking among alcohol abusers are considered to be more valid than average. There is also strong evidence that drug use surveys in general populations of adults, high school students, etc. on the whole provide sufficiently valid data on drug use to enable at least conclusions about aggregated trends over time.

A fair number of studies have been conducted trying to judge the validity of self-reports on substance use by drug users and abusers. Out of 54 reports located by the present authors, 48 assessed that such self-reports were reasonably valid if certain conditions were met in executing the studies. The most important condition mentioned was that the substance abuser be told that checks will be made to ascertain the truth value of the information that he/she provides. Obviously, this tactic can only be used with information for which there is independent information available, in most cases information that has been recorded by authorities at some point in time and which is available to the researchers.

In responding to the CLAI questionnaire administered by the Correctional Service of Canada staff, the inmates are informed that a limited number of staff will have access to the responses on the CLAI. The inmates are also in all probability aware that some members of the staff have access to other files with independent personal information. In important respects the CSC study therefore seems to satisfy the requirement that the respondent have prior knowledge of possible validity checks of the information he provides. It was earlier mentioned that Robinson, Porporino and Milson (1991) examined the reliability and validity of some components of the CLAI and concluded that this instrument had good psychometric properties and a high level of agreement with information from the inmate's file. The inmates who participated in the inmate interviews (the FII and PII studies), on the other hand, were told that all information would be kept strictly confidential and that no attempts

would be made to access the inmate's files. The estimates from the two types of studies do not differ much in spite of such differences in method.

It is perhaps also relevant in this context that many studies that have provided the empirical basis for attributable fraction estimates for alcohol or drugs in the past have used data whose validity can be questioned. Attributable fractions for alcohol in relation to violent crimes are most often taken from studies that use police or court records to ascertain whether the perpetrator and victim had been drinking prior to the crime. As is the case in our data, information on alcohol and drug use in these records is to a large extent provided by individuals involved in the crime. In other cases it is provided by the arresting officer, as is the case in our study of arrestees. In this regard, our-self-report studies and our arrestee study are probably no less reliable than previous studies yielding attributable fraction estimates.

8.3.2 "Would you have committed the crime if you had not been under the influence?"

The assumption that the inmate is in a position to validly assess whether he would have committed the crime had he not been under the influence of alcohol or drugs can be seriously questioned. In the CSC and FII studies 77% and 70% of those under the influence of drugs, 79% and 66% of those intoxicated from alcohol and 86% and 74% of those intoxicated from both substances stated that they would not have committed their most serious crime had they not been intoxicated. The correction decreases the sizes of the attributable fractions by between 14% and 23% in the CSC study and by 26% to 34% in the combined estimates from Quebec and Ontario in the FII study. The estimates of this factor in the provincial samples differ considerably from the estimates in the federal data. To some extent, perhaps especially for women, they may reflect true differences. It is not possible to judge this from our data. Despite severe doubts regarding the objective validity of such judgments, this correction seems to provide an improvement compared to accepting the intoxication model without any downward adjustments, as has been previously done in several studies.

8.3.3 "Was this crime committed to get or while trying to get drugs/alcohol for your own personal use?"

It is perhaps easier for the inmate to judge his/her motivations for committing a crime, in this case to get drugs or alcohol for personal use, than to truthfully assess what would have happened if he/she had not been drinking. Objections that are directed at the validity of responses to this key question are greatly neutralized because of the extensive overlap between the intoxication and economic-compulsive models. Fully 93 % of the cases from the latter were already included in the attributable fraction on the basis of the corrected intoxication model.

8.3.4 General comments

The use of two different data collection methods to study federal inmates did not greatly affect the results, which indicates that a sufficient degree of reliability was achieved. Reliability is of course a necessary, but not sufficient prerequisite for validity. Independent information about the true state of affairs is difficult or impossible to obtain for most of the central variables used in our analyses, and direct validity measures are therefore not possible.

In addition to serving as a method for assessing the aggregate validity of the inmates' responses the comparison of the CSC findings and the subset of identical questions in the FII study to some extent serves as a check of the three criticisms above, in the sense that it provides an estimate as to the robustness of such estimates in the face of varying situational settings: an interview situation with a female research assistant from outside the prison setting versus privately responding to a computerized questionnaire by means of punches on a keyboard.

9. Conclusions and future research

Important conclusions regarding the role of drugs and alcohol in Canadian crime can be drawn from the findings of our studies. The studies also highlight conceptual, theoretical and methodological issues that are important in the study of the connections between drugs, alcohol and crime. These aspects also point to future tasks for research. Before discussing these it is probably useful to briefly summarize the methods and the findings of the studies that have been scattered over different sections of this report.

Methodological considerations. The general aims of the empirical studies was to arrive at estimates of (1) the strength of the associations between different types of crimes and the use and abuse of psychoactive substances and (2) the share of crimes in Canada that can be attributed to the use and abuse of alcohol and drugs.

It was stated earlier that it is not possible to estimate the role of alcohol and drugs in the total volume of crimes committed in Canada because most crime incidents remain undetected and unreported. General population crime studies are possible, but the sample sizes needed would make such studies prohibitively expensive, and information on the perpetrator of the crime would in many cases be missing. Furthermore, the crime events reported in such studies would in many cases not stand up to a court test, which is the most widely accepted criterion for a crime having in fact been committed. In order to satisfy this screening requirement and to obtain relatively serious crime occurrences for study, it was decided that our research would focus on prison inmates and on individuals arrested for a crime.

Canada-wide estimates were possible from the two studies of federal inmates. For economical and logistic reasons, the study of provincial inmates was limited to interviews with a relatively small number of female and male inmates in two provincial prisons in Québec, with no weighting or extrapolation procedures possible for making all-Canada estimates. The study of arrestees collected information from 14 Canadian cities with a population of 100,000 and over.[30] This study is a valuable first step in research on the role of psychoactive substances in relatively serious crimes as they appear on the community level. The findings roughly indicate the size of the relationship, but estimates cannot be statistically assessed for their generalizability to existing patterns among arrestees in all of Canada.

The empirical findings. A great proportion of inmates in both federal and provincial prisons reported having been users of illicit drugs while not in prison. Slightly more than half of federal inmates reported having used drugs during the six months immediately prior to their last arrest. Almost two-thirds of both male and female inmates in the two Québec provincial prisons had used drugs during the same period.

30 The only exception to this size limit was Fredericton with a population of 74,000.

Cannabis was the drug most frequently used by federal inmates outside the prison walls with 43% having used it in the six months preceding arrest, while 28% had used cocaine and 7% had used heroin. The proportion of alcohol users during the six month period did not differ much in any of the prison samples from that found in the general adult population of Canada.

Although having used alcohol at all was much more widespread among the federal inmates, frequent use of illicit drugs was just as common as frequent use of alcohol, with 30% having used these substances at least a few times a week. The use of drugs and alcohol on the same occasion was prevalent, with 40% of federal inmates reporting such use during a six-month period. During the same period, about one in seven federal inmates had used both alcohol and one or more illicit drug jointly at least a few times a week.

Two widely used psychological scales were used to determine whether an inmate was dependent on alcohol or drugs. According to the Alcohol Dependence Scale between 13% and 16% of the federal inmates were dependent on alcohol, while the Drug Addiction Severity Test indicated that between 31% and 40% were dependent on one or more illicit drug. Included in these numbers are the 8% who were assessed to be dependent both on drugs and alcohol. In all, between 38% and 44% of male federal inmates were dependent on at least one of the psychoactive substances. The corresponding prevalence figure in the Québec provincial prisons was 48% of men and 49% of women. The proportion of alcohol-dependent and drug- dependent inmates was very similar in the federal and provincial inmate populations. Considering the small provincial samples, the fact that different regions of the country were covered by the federal and provincial studies, and the considerable differences in the types of crimes that federal and provincial inmates had committed, it is remarkable that the differences in substance use and dependence between federal and provincial inmates were so small. It is also noteworthy that male and female inmates differed little in the prevalence of alcohol and drug addiction. The very different method used in the arrestee study yielded “abuser” estimates that were relatively similar to the dependence estimates from the inmate studies.

The linkage between alcohol use and violence was evident in that alcohol-dependent inmates and arrestees were much more likely to have committed a violent crime than were drug-dependent inmates. The pattern was reversed with regard to gainful crimes with drug dependence entailing a much higher risk of having committed this type of crime.

Several of the inmates had committed thousands of crimes during a three-year period. Most were of a relatively non-serious nature, such as drug possession and trafficking, shoplifting and minor thefts, as well as prostitution among the female prisoners. A central aim was to estimate the volume of crime committed while not in prison, and to relate this volume to substance use patterns at the time. Federal inmates who reported having used neither drugs nor alcohol during a six-month period in freedom reported on average 1.7 crimes a week, while those who used one or more substances without being dependent on any had

committed 3.3 crimes a week. The inmates who were dependent on a psychoactive substance (either drugs or alcohol or both) had committed the most crimes – averaging about 7.1 crimes in a one-week period.

More than half of the male offenders entering federal and provincial custody reported having been under the influence of a psychoactive substance when they committed the most serious crime on their current sentence. Alcohol intoxication was somewhat more common than drug intoxication. However, a substantial proportion of offenders reported having been under the influence of both substances at the time. Slightly less than half of female offenders entering provincial prison were under the influence of a substance at the time of their most serious crime, with drug intoxication more common than alcohol intoxication.

The arresting police officers faced a difficult task in trying to determine whether the arrestee was under the influence of a psychoactive substance at the time of arrest, and in trying to identify the nature of that substance. As with the male federal inmates a little more than half of the arrested males were judged to be under the influence of one or more psychoactive substance, while this was true for somewhat less than half of the female arrestees. The overall substance intoxication figures did not differ much from those found in the inmate studies. The presence of alcohol, however, was judged to be much higher than that of illicit drugs. To some extent the extensive presence of alcohol may be an artefact of the relative ease with which alcohol intoxication can be determined, but it probably also reflects the higher share of alcohol use and abuse among lawbreakers at the community level.

Although cannabis was used by more federal offenders, cocaine dominated among the drugs of intoxication at the time of the most serious crime, with cannabis (often combined with alcohol) in second and heroin in third place. This pattern was reversed among the male provincial inmates in the Québec prison where more offenders had been under the influence of cannabis than cocaine. On the other hand, cocaine intoxication was much more common among the female provincial inmates; about one-fourth had used cocaine at the time of the most serious crime, three times more than had been using cannabis. As was the case among the federal inmates, the share of heroin intoxication was low.

Alcohol use was again strongly linked to the various violent crimes, with more than half the federal offenders being under the influence of alcohol when they committed a homicide, an attempted murder or a serious assault. Between 6 and 7 out of 10 offenders who had committed a very serious violent crime were under the influence of a psychoactive substance at the time. Thefts, robberies and breaking and entering were crimes in which drug intoxication predominated. Intoxication from a combination of drugs and alcohol was relatively common in almost all types of crimes.

It is known from previous studies of crime offenders and substance abusers that a significant proportion of crimes are committed in order to get a psychoactive substance for personal use. The estimates obtained in the different studies were remarkably similar.

Between 14% and 16% of both arrested individuals and inmates reported having committed their most serious crime in order to get drugs for personal use, while between 5% and 7% of males said they did it to get both drugs and alcohol. Only 1-2% stated that getting only alcohol for personal use was a reason for committing their most serious crime. Only 1% of the arrestees were judged to have had the joint use of alcohol and drugs as an incentive for the crime, but this discrepancy may to some extent be explained by the different method used in the data collection. Very few inmates and arrestees who were not dependent on drugs (or, in the case of arrestees, assessed to be drug abusers) had committed their most serious crime in order to get drugs for their own use.

One in four federal inmates who had committed a theft as their most serious crime reported their own drug use as a reason for the crime. This share increases to two in five when the inmates who reported getting *both* drugs and alcohol are included. About one-third of robberies and breaking and entering crimes were also driven by the motivation to get drugs for personal use. This motivation was present in only between 3% and 5% of the homicides, attempted murders and assaults (including the incentive from personal use of both alcohol and drugs, this share increases to about 5%). Drug offenders who are sentenced to more than two years' confinement (and therefore served time in federal penitentiaries) are usually career criminals relatively high in the distribution chain and participate in the drug economy mainly "for the money". This no doubt explains the relatively low proportion (17%) who reported personal drug use as a motivation to commit their drug crime.

A main objective of the studies was to go beyond measuring mere associations and try to estimate the proportions of crimes that could be *attributed* to the use and abuse of alcohol and drugs. The attributable fraction measure is used predominantly in studies of public health where certain risk factors are known for many illnesses and where causal linkages are rather clear. Causal models are much harder to come by in the explanation of human behaviour, and human motivations, including motivations for criminal behaviour, are more complex. In order to avoid making questionable causal attributions it was decided that the models underlying attributable fractions must meet relatively strict criteria of causality.

The literature has specified three main ways in which the existence of drugs and alcohol in society can cause crimes. The first is commonly associated with the way in which alcohol is linked to violent crime: the *intoxication* by alcohol is a significant causal factor. The second type of linkage is by way of *addiction*; the crime was committed because addiction "drove" the perpetrator to commit a crime so that he or she could obtain drugs for personal use. A third possible factor was deemed not to have the same characteristic of individual compulsion as the partly chemical influences of intoxication and addiction, although it is part of a drug-related *social* process which brings about a certain proportion of crimes in Canada. This is the *systemic* aspect of crime: due to the illegal nature of the drug market and the lack of legal regulation within that market, the regulation occurs by means that are in themselves criminal. This occurs mainly by violent means, such as assaults, robberies and homicides linked to turf wars, collections of drug debts, etc. If the illegal drug market

were to disappear many of the criminals who commit systemic crimes within the drug economy would branch into other types of crime (as they already have in many cases). The disappearance of drugs from society would not, in other words, necessarily reduce systemic criminality.

Intoxication and dependence provided the estimates for the proportions of crimes attributable to drugs and alcohol in Canada. As the estimates are based on three different types of offender samples with varying geographical coverage and no possibilities for instituting weighting in order to arrive at one definite estimate, it was decided that ranges of estimates would be used that incorporated the point estimates from the different studies. In order to avoid a false impression of exactness, the range estimates are given as multiples of 0.05.

The proportion of relatively serious crimes that are in a significant way determined by the use of **any psychoactive substances** in Canada is estimated as being *between 40% and 50%*. This breaks down into a proportion that is caused by the use of **illicit drugs only,** which is estimated at *between 10% and 15%*, and the proportion caused by **alcohol only,** for which the estimate is *between 15% and 20%*. In addition, the use of illicit drugs and alcohol turned out to be so closely linked in a proportion of crimes that trying to separate them would have been misleading. A partial estimate (which is also included in the above total estimate for all psychoactive substances) was therefore made for a **combined category of illicit drugs and alcohol** with a value *between 10% and 20%*.

Estimates of causal impact pertaining to *all crimes* committed during a three-year period by individuals who had perpetrated crimes that were serious enough to have landed them in provincial prison or federal penitentiary were possible from the calendar data. These estimates are weighted towards less serious crimes, mainly in the form of minor thefts and drug infractions. Again the data pertaining to the federal inmates are most suitable for the purpose, in this case the information from the 469 interviews with federal inmates in Québec and Ontario. For this total set of crimes, the total attributable fraction estimate for **all psychoactive substances** is 0.64. This can be compared to the corresponding estimate for all most serious crimes on the inmates' current sentence which was 0.46. This indicates that the causal role of psychoactive substances may be greater among less serious crimes.

It should also be noted that a very small share of crime can be said to be exclusively determined by the use or abuse of drugs or alcohol. In the great majority of cases, it is necessary for other factors to be present. For instance, the effects of alcohol, or a drug such as cocaine or one of the amphetamines, can be largely indeterminate, but given a certain type of situation these effects will significantly increase the likelihood of specific types of risk-taking or confrontational behaviours resulting in criminal acts. Nevertheless, drugs or alcohol and their effects on the organism are a necessary element in many crimes that occur under intoxication or that are committed by individuals dependent on the substance.

Crimes such as drug possession, drug trafficking, drug manufacture and drug use are a special category of crimes. They are intimately linked to drug use, but they are in many cases not *caused* by the use and abuse of drugs. The same criteria of compulsion or lack of free choice mediated by intoxication or addiction were used to arrive at estimates of attributable fractions for these crimes as for the other types of crimes. However, it is relatively common in the literature to include all such *drug-defined crimes* in the attributable fraction for drugs on criminality. Doing so, assigns a fraction of 1.00 (i.e., 100%) to the drug crimes. Including the drug-defined crimes in the calculation of the overall attributable fraction in the CSC federal inmate study increases the psychoactive substance fraction from 0.46 to 0.57.

Whatever one thinks of the necessity or desirability of present policy directed at psychoactive substances, one must keep in mind that a great share of the crimes that are often seen as "caused by " illicit drugs or the illegal drug market are, in the final analysis, mainly determined by the definitions of the legal system.

Future studies. The main findings of this report provide still another confirmation of just how close the association is between the use of psychoactive substances and criminal behaviour. In light of the social and political concern with the linkage between crimes and the use of illicit drugs, it is perhaps surprising to find that alcohol appears to have a somewhat stronger causal impact on serious crime than do drugs. Drugs seem to have a stronger impact than alcohol on minor crimes, such as shoplifting, prostitution and (by legal definition) drug possession and small-scale trafficking.

However, considering alcohol and illicit drugs as totally distinct causal entities is misleading. It is notable that no individual substance, either cannabis or cocaine or heroin, is as consistently part of serious drug-related crimes as is alcohol. To put it differently, in the causation of serious crime at least, alcohol is part of the "drug scene" at least to the same extent as are any of the individual types of illicit drugs.

The findings reflect the prevailing conditions during the period from the mid-'90s to the very beginning of the new millennium. This may have been a relatively stable period in terms of the availability of various types of psychoactive substances and the social conditions that determine their use and the rates of various types of crimes. To a considerable extent this stability depends on the self-regulatory nature of the illicit drug market. However, this may change, and we should be alert enough to spot such changes.

Neither the extent of drug and alcohol use and abuse nor criminal behaviour are stationary phenomena, and the linkages between the two do change over time. For this reason the research described in this report needs to be replicated in the future. The estimates of the share of crime that can be attributed to drugs and alcohol should be based on studies using more than one type of method. Longitudinal studies are the best way to examine how the volume of crimes varies with the use and abuse of psychoactive substances.

Studies are conducted regularly on the alcohol and drug use habits of Canadians. Considering the close relationship between the use and abuse of psychoactive substances and criminal behaviour in Canada, it would seem useful to also repeatedly conduct studies that focus on this relationship. However, in order to obtain large enough samples of criminal events and individuals who commit crimes in general population samples, one would have to include a great number individuals at very high cost. More efficient targeting is needed, and this was attempted in the present research program. However, the sampling procedure needs to be made more scientific, although this will considerably increase the costs.

The data used in the analyses of this report are lacking in coverage. In future studies one should naturally strive to get a better geographical representation of federal inmates in Canada. Regions outside Québec and Ontario were seriously under-represented in the CLAI data provided by the Correctional Service of Canada. It was possible to correct for this in a provisional manner by weighting procedures. Interview data were, on the other hand, collected only from the Ontario and the Québec regions. A natural extension would be to include other Canadian provinces in the framework of such interviews. Despite the shortcomings, the estimates arrived at separately in the CSC and FII studies are very similar and in all probability do not differ appreciably from the true figures for this criminal population.

The interview studies of male and female provincial inmates were conducted only in Québec, and should be viewed as no more than a convenience sample as far as the selection of facilities is concerned. Provincial facilities are under provincial control and the task of getting access to an unbiased sample of facilities and inmates can be daunting. It is nevertheless obvious that a less *ad hoc* way of sampling is needed and that this ought to ideally be done from a listing of all provincial prisons in Canada.

Sampling that is based on scientific principles is also needed for any future studies of arrestees. It was not possible to achieve this within the fiscal constraints of our research program. We are faced with great challenges in trying to achieve access and in solving problems with fieldwork logistics, but the goal of representative coverage will probably act as an incentive for improved coverage in future attempts

In the ideal world of unlimited access and limitless resources it would also be possible to study the flow of criminal events from commission through various kinds of dispositions and to see how various factors, including associations with drugs and alcohol, fare in the different junctions displayed in Figure 2.1. It can be questioned whether the estimation of associations and attributable fractions for drugs and alcohol on crimes in Canada would by itself justify including additional populations of crimes and criminals for study. However, such studies could easily include questions on the prevalence of other relevant social factors and other potentially active causal relationships of interest both to the research community and policy-makers.

Using a combination of approaches. We ought to use more than one method for the measurement of statistical associations and causal attributions. As pointed out above, time series analyses based on published or otherwise available statistical data is only possible for (legal) alcohol consumption. For the purpose of conducting time series analyses on the impact of drug use on crime, one would need to collect independent data through surveys either of the general population (a costly exercise) or of populations of special interest such as known law-breakers or drug users/abusers. Other high-risk populations include youth, especially young males, but in order to make such studies more generally applicable the follow-up periods would have to be long, preferably several decades. This is not an impossible task, but it requires a considerable commitment from both funders and researchers. Precedents exist, among others in the work of McCords and Robbins in the United States, as well as in several Scandinavian cohort studies.

Replication is the essence of scientific validation. Strict replication under almost identical conditions and by different teams of researchers is possible only in the natural sciences. Replications of epidemiological and social science studies under different environmental conditions (such as in different countries or separate jurisdictions) still have value by pointing to external factors that may qualify findings of earlier studies, and thereby advance the search for explanatory factors and policy options. Replications of measurements over time, besides serving a monitoring function, can also contribute information on the impact of policy changes, and point to causal factors that affect the prevalence of various types of crimes.

In summary, the discussion above points to the following obvious conclusions: Studies need to be carried out from (1) a wider sample of provincial prisons in Canada, and (2) using a probability sample of arrests in Canadian communities of different sizes. A coordinated effort to study provincial inmates in as many Canadian provinces as possible would seem a worthwhile project. Longitudinal studies of various criminal populations as to their drug and alcohol use patterns and state of substance dependence would serve an important monitoring function. The CLAI project which contributed to this report is an excellent monitoring project that is underway in the federal prisons of Canada. However, the base of estimates should be broadened to include other important junctions in the flow of criminal events and offenders from commission to detection and the different legal dispositions. Some victimization studies among general populations in, for instance, the U.K., include questions on alcohol and drug intoxication of the perpetrator (in the cases where he/she is known), and of the respondent/victim. Such studies provide the best method available to date for accessing information on crimes committed in the community.

Other research questions. Planned use of drugs or alcohol in connection with criminal activities (e.g., using intoxication as a "tool") implies serious conceptual problems for the assignment of a causal role to a substance. For this reason, and for its intrinsic interest as well, it is important to find out to what extent different psychoactive substances are linked to different types of crimes. It was mentioned in the introductory section of this report that

some violence is preceded by drinking in order to achieve a certain mental state that would facilitate violence. Having knowledge of this in the case of individual crime events is of course important to the courts. For preventive purposes it is also useful to know to what extent this occurs for the various types of psychoactive substances and the different types of crimes in Canada. [31] Questions or scales can be designed to address this possibility.

Conversely, we also need to know more about the role that truly being overwhelmed by the effects of drugs or alcohol plays in the causation of different types of crimes. Up to this point there is very little systematic information on this aspect in the world-wide literature on the links between drugs, alcohol and criminal behaviour.

Why are certain drugs combined with other types of substances? There exists a scattered literature on the subject, but not much of it applies directly to the links with crimes. To what extent is this practice an attempt at maximizing or optimizing of planned effects? To what extent does sheer availability play a role, and is this why alcohol is the most widely used individual substance even in drug-related crimes? What does this combined use imply for drug and alcohol policy?

Some conceptual problems remain with the present approach and the research methodology can always be improved. Validity concerns can be raised in any research that employs self-reported data in sensitive areas of behaviour. A number of factors indicate that a large majority of the inmates answered the questions on their drug and alcohol use as well as their criminal behaviour truthfully, but validity studies should also ideally be carried out.

Implications for social cost calculations. One important conceptual question for social cost calculations concerns what to do with the crimes that were, according to our criteria, caused by both alcohol and drugs. Can crimes attributable to this combination be divided up between an attributable fraction for alcohol and a fraction for drugs? It is difficult to judge if it would make sense, in future studies, to ask an inmate or arrested person, etc. which of the substances was the most important in causing the crime. To some extent perhaps the perpetrator's history of abuse, treatment and societal reactions can provide sufficiently valid information for assigning a prime causal role to either of the two substances.

But do we need to separate the role of drugs and alcohol in the cases where both had been involved in causing the crime? It is a fact that they do exist in the crime episodes simultaneously, either as causal or motivating factors. Perhaps it is time to take this into

[31] Mind-altering drugs are commonly used for specific purposes, as is also evident in the responses given in general population survey to questions asking about their reasons for drinking or using drugs. Perhaps the most recent example of this type of drug use is use of the so-called ecstacy drugs for the purpose of heightening sensory experience and enabling physical exertion over lengthy periods of time.

account in assigning attributable fractions. However, the advisability of using a combined attributable fraction will naturally depend on what purpose it is used for, especially in the framework of the social costing process.

A primary aim of our project was to provide attributable fractions for alcohol and drugs on crime in Canada. However, for the purpose of calculating the social costs of keeping inmates in federal penitentiaries (a considerable sum), using attributable fractions for federal inmates is probably more accurate than using an overall fraction for all crimes in Canada. The same applies to crimes committed by provincial inmates in Canada. In the same way, estimates from the study of individuals arrested by the police may be more (but not exclusively) relevant for policing costs.

The method for calculating attributable fractions that has been used in this report provides easily accessible information on the share of crime contributed by different determinant processes linked to drugs and alcohol (such as intoxication, economic incentive or participation in a drug economy) and their combinations. From the point of prevention it will also be important to know which type of processes predominate, what the overlaps between the causes are and what changes occur over time in these constellations. It is important to monitor the relative importance of intoxication and economic incentive (in addition to systemic influences and the effects of some legislative changes) over time and in different populations.

Another advantage of using event-based data for estimation is that it makes it possible to distinguish individual cases from non-cases on attributable fraction *variables*; a crime event is either a positive case on the intoxication variable or not, and the same dichotomy applies to the economic-compulsive variable. This means that attributable fractions can very easily be arrived at for different types of crimes, for different subgroups of offenders, etc. For instance, given a large enough sample of perpetrators or crime events, one can easily get estimates of what proportion of violent crimes among perpetrators under 30 years of age were attributable to alcohol or drugs. Similar analyses from co-variation studies would require much more inferential measures and more cumbersome methods of estimation.

Establishing causality is naturally a key element in the estimation of attributable fractions. The method used here has taken its starting point in a set of causal models that specify the processes by which the use and abuse of alcohol and drugs become linked with crime. Although approaching the question from different conceptual extremes and by different methods, the method using additive causal models based on crime events and the aggregate co-variation method in principle measure the same reality and aim at getting the same estimates of attributable fractions. Under ideal circumstances they should therefore arrive at the same numerical estimates in a population. An interesting question is how similar attributable fractions for alcohol from, for instance, time series analyses are to attributable fractions for alcohol based on self-reports on individual crime events. Such comparisons would be possible for a number of countries or other jurisdictions but only for alcohol. It

must be a central aim in the estimation of attributable fractions, and in understanding the causal processes involved, to arrive at a stage where the aggregate and individual level estimates converge.

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APPENDIX

INTERVIEW PROTOCOL

Consent form

This form confirms that I agree to participate in the following research project:

The proportion of crimes attributable to alcohol and drugs in Canada (R51)

The justifications and possible risks of participating in this research have been explained to me. I understand that I am a volunteer and I can withdraw at any time. I am aware that my participation in this project won't have any repercussions on my sentence conditions or duration and that I won't get any reward for participating in this project. I give the research assistant my authorisation to:

-Consult my file: yes ☐ no ☐
-Discuss my case with the institution's employees: yes ☐ no ☐
-Use the information obtained during the interview: yes ☐ no ☐

$$Any information communications would be done as long as the form permit my identification.$$

Name: (participant): _____ FPS: _____

Signature (participant): _____ Date: _____

Signature (research assistant): _____ Date: _____

No.: _____

Date: _____

Life events

	07/99-05/99	04/99-02/99	01/99-11/98	10\98-08\98	07\98-05\98	04\98-02\98	01\98-11\97	10\97-08\97	07\97-05\97	04\97-02\97	01\97-11\96	10\96-08\96
Residence: 1-with sexual partner and children 2-with sexual partner alone 3-with children alone 4-with parents 5-with family 6-with friends 7-alone 8-controlled environment 9-incarcerated												
City/country												
1- marriage (date) **2- divorce (date)** **3- separation (date)**												
Children (number) ☐ (Age and sex)												
Other parenting (relationship/age and sex)												
Education: 1-full time 2-part time 3-stage												

	07/99-05/98	04/99-02/98	01/99-11/98	10\98-08\98	07\98-05\98	04\98-02\98	01\98-11\97	10\97-08\97	07\97-05\97	04\97-02\97	01\97-11\96	10\96-08\96
Employment A-declare B-undeclare 1-full time 2-part time 3-unemployed												
Arrested (date)												
Probation/parole												
Disability												
Crime victim (date)												
Deaths (relationship/date)												
Gang involvement												
Holidays/birthdays												
Vacations												
Other												

No. _____
Date:_____

Drug events

a) Exactly when do you think you became addicted ? (Unable to control use of the substance)_____
b) Why do you think your dependency period began at this particular moment ?_____

	01/99-11/98	10\98-08\98	07\98-05\98	04\98-02\98	01\98-11\97	10\97-08\97	07\97-05\97	04\97-02\97	01\97-11\96	10\96-08\96	07\96-05\96	04\96-02\96
–Type of substance *(write N if the person have not use the product)* **1-alcohol** **2-heroin** **3-methadone** **4-other opiates/analgesics** **5-barbiturates** **6-other sed./hyp./tranq.** **7-cocaine** **8-amphetamines** **9-cannabis** **10-hallucinogens** **11-inhalants** **–For each product:** **1- frequency of use** **(A) every day or almost every day** **(B) a few time a week** **(C) a few times a month** **2-Quantity** **3-Drug use method** **4-Amount of money spent for the substance**												

	01/99-11/98	10\98-08\98	07\98-05\98	04\98-02\98	01\98-11\97	10\97-08\97	07\97-05\97	04\97-02\97	01\97-11\96	10\96-08\96	07\96-05\96	04\96-02\96
Substance use (days/30)												
Hospitalization (days/30)												
Incarceration (Days/30)												
Incomes:												
-Employment (Net income)												
-Unemployment compensation												
- welfare												
-Pension benefits or social security												
-Sexual partner, family or friends												
-Debts												
-Illegal (source) 1-money 2-drugs												

	01/99-11/98	10\98-08\98	07\98-05\98	04\98-02\98	01\98-11\97	10\97-08\97	07\97-05\97	04\97-02\97	01\97-11\96	10\96-08\96	07\96-05\96	04\96-02\96
Crimes: *(if possible in absolute number)* **For each crime:** • **Intoxicated (I) or not intoxicated(NI)** • **Systemic delinquency (S)** • **Economico-compulsive delinquency (E-C)** • **Amount of money gain from this crime** **a. murder/manslaughter/ homicide** **b. assault** **c. armed robbery** **d. burglary** **e. shoplifting** **f. vehicle theft** **g. robbery** **h. drug importation** **i. drug trafficking** **j. drug possession** **k. sexual offense** **l. fraud** **m. criminal negligence** **n. mischief** **o. larceny** **p. vandalism** **q. public disorder** **r. parole/probation violation/contempt of court/unlawfully at large** **s. other**												
Other crimes												

2. Incomes: explanation of the difference between incomes and the amount of money spent for alcohol and drug use_____
3. Proportion of the crimes related to alcohol and drugs: _____

SHORT CLAI

No._____
Date:_____

A. Background information:

1. How old are you ?

_____Years old

2. Were you born in Canada ?

1. No
2. Yes

3. What is your ethnic background ?

1. Asian
2. Black (African)
3. White (caucasian)
4. American/Canadian indian
5. Metis
6. Eskimo/Inuit
7. American-latino
8. Italian
9. Others Specify:_____

B. Lifetime Experience 1:

4- Over your lifetime have you ever used or tried any of these drugs
(not including when you were sick and needed them as medicine) ? (C001)

1. Marijuana or Hashish
2. PCP
3. LSD
4. MDA
5. Cocaine
6. Barbiturates
7. Quaalude
8. Amphetamines
9. Methadone
10. Heroin
11. Valium or other tranquillizers
12. Glue or gas
13. Crack
14. Other type of drug
15. More than one drugs

NO, go to question 6.

5. How old were you when you first used drugs ? (C002)

_____ Years old

6. **Over your lifetime**, have you ever had a drink of liquor, beer, wine or any other alcoholic beverage ? (D001)

1. No
2. Yes

7-How old were you when you first got involved in activities that were illegal ? (F001)

_____Years old

C. Current sentence

Next, we have some questions about your current sentence, the one for which you are serving right now.

8-For how many crimes or charges were you convicted on your current sentence ? (F006)

_____Crimes

9-Did you use any drugs on the day of any of the crimes on your current sentence ? (F008)

1. No (go to Q. 11)
2. Yes

10-For how many of your current crimes were you under the influence of drugs ? (F009)

_____Crimes

11- Did you drink any alcohol on the day of any crimes on your current sentence ? (F010)

1. No (go to Q.13)
2. Yes

12-For how many of your current crimes were you under the influence of alcohol ? (F011)

_____Crimes

D. The crime with the longest sentence

Next, we would like to ask you about a particular crime. Think back to all of the crimes on your current sentence, the one for which you are serving time right now. For which one of these crimes did you receive the longest sentence ?

The following questions concern this particular crime.

13- Were you under the influence of drugs or alcohol at the time of the crime for which you received the longest sentence ? (F012)

1. No
2. Yes

14- What type of crime was this one ? (F015)

1. Murder, manslaughter, or infanticide
2. Attempted murder
3. Assault or wounding
4. Robbery or attempted robbery
5. Abduction or kidnapping
6. Sex offence
7. Break and enter
8. Theft
9. Possession of stolen property
10. Fraud or forgery
11. Extortion
12. Prostitution
13. Gaming and betting
14. Possession of weapon
15. Driving while impaired
16. Other traffic offence
17. Drug offence
18. Escape

19. Unlawfully at large
20. Other type of offence Specify: _____

15- Was this crime committed to get or while trying to get drugs for your own personal use ? (F016)

1. No
2. Yes

16- Was this crime committed to get or while trying to get alcohol for your own personal use ? (F017)

1. No
2. Yes

Think back now to the day of this crime. We are interested in how you think drugs or alcohol may have affected you at the time of this particular crime.

17-What did you use on the day of this crime ? (F018)

1. Drugs
2. Alcohol (go to Q. 25)
3. Both drugs and alcohol (go to Q.33)
4. Neither alcohol nor drugs (go to Q. 41)

Drugs

18-what type of drug did you use on the day of this crime ? (F019)

1. Marijuana or Hashish
2. PCP
3. LSD
4. MDA
5. Cocaine
6. Barbiturates
7. Quaalude
8. Amphetamines
9. Methadone
10. Heroin
11. Valium or other tranquillizers
12. Glue or gas
13. Crack
14. Other type of drug
15. More than one type of drug

19- How high or stoned did you feel at the time of this crime ? (F021)

1. Not at all stoned
2. Somewhat stoned
3. Very stoned

20-Compared to how you usually feel when you use drugs, how stoned did you feel at the time of this crime ? (F022)

1. Less than usual
2. Same as usual
3. More stoned than usual

21-Did drugs affect your judgement at the time of this crime ? (F023)

1. Made my judgement worse
2. Had no effect
3. Affect my jugment

22-Do you think you still would have committed this crime if you had not been using drugs ? (F027)

1. No
2. Yes

23- Do you think you would have been caught by the authorities if you had not been using drugs ? (F028)

1. No
2. Yes

24-Why do you think you were using drugs on that day, before committing the crime ? (F041)

1. To relax
2. To forget about my problems
3. To have a good time
4. To get courage
5. Because I felt lonely and depressed
6. Because I was under stress
7. Because I was bored
8. To cure withdrawal symptoms or hangovers
9. To get along with other people
10. To get rid of hang-ups

Go to question 41

Alcohol

25-How much did you drink on that day ? (F043)

1. Less than usual
2. Same as usual
3. More than usual

26-How did you feel at the time of this crime ? (F044)

1. Not at all drunk
2. Somewhat drunk
3. More drunk than usual

27-Compared to how you usually feel when you drink, how drunk did you feel at the time of this crime ? (F045)

1. Less than usual
2. Same as usual
3. More stoned than usual

28-Did the alcohol affect your judgement at the time of this crime ? (F046)

1. Made my judgement worse
2. Had no effect
2. Made my judgement better

29-Do you feel that the alcohol affected you in committing this crime ? (F049)

1. Made me less likely to commit the crime
2. Had no effect
3. Made me more likely to commit the crime

30-Do you think you still have committed this crime if you had not been drinking alcohol ? (F050)

1. No
2. Yes

31-Do you think you would have been caught by the authorities if you had not been drinking ? (F051)

1. No
2. Yes

32-Why do you think you were drinking on that day, before committing the crime ? (F064)

1. To relax
2. To forget about my problems
3. To have a good time
4. To get courage
5. Because I felt lonely and depressed
6. Because I was under stress
7. Because I was bored
8. To cure withdrawal symptoms or hangovers
9. To get along with other people
10. To get rid of hang-ups

Go to question 41

Alcohol and drug use

33-How much did you drink and use on that day ? (F067)

1. Less than usual
2. Same as usual
3. More than usual

34-What type of drugs did you use the day of that crime ? (F065)

1. Marijuana or Hashish
2. PCP
3. LSD
4. MDA
5. Cocaine
6. Barbiturates
7. Quaalude
8. Amphetamines
9. Methadone
10. Heroin
11. Valium or other tranquillizers
12. Glue or gas
13. Crack
14. Other type of drug specify:_____
15. More than one type of drug (encircle)

35-How drunk and stoned did you feel at the time of this crime ? (F068)

1. Not at all drunk and stoned
2. Somewhat drunk and stoned
3. Very drunk and stoned

36-Compared to how you usually feel when you drink and use drugs, how drunk and stoned did you feel at the time of this crime ? (F069)

1 Less drunk and stoned than usual
2. Same as usual

3. More drunk and stoned than usual

37-Do you feel that alcohol and drugs affected you in committing this crime ? (F073)

1. Made me less likely to commit the crime
2. Had no effect
3 Made me more likely to commit the crime

Next, we would like you to speculate about what would have happened on the day of this crime if you had not been drinking and using drugs

38-Do you think you still would have committed this crime if you had not been drinking and using drugs ? (F074)

1. No
2. Yes

39-Do you think you would have been caught by the authorities if you had not been drinking and using drugs ? (F075)

1. No
2. Yes

40-Why do you think you were drinking and using drugs on that day, before committing the crime ? (F088)

1. To relax
2. To forget about my problems
3. To have a good time
4. To get courage
5. Because I felt lonely and depressed
6. Because I was under stress
7. Because I was bored
8. To cure withdrawal symptoms or hangovers
9. To get along with other people
10. To get rid of hang-ups

E. Victims

41-Was there a victim present at the time of the crime ? (F103)

1. No (go to Q.46)
2. Yes

42-Was your victim using drugs at the time of this crime ? (F109)

1. No (go to q. 44)
2. Yes

43-Do you feel the fact that your victim had been using drugs influenced you in committing the crime ? (F112)

1. Made me less likely to commit the crime
2. Had no influence
3. Made me more likely to commit the crime

44-Was your victim using alcohol at the time of this crime ? (F105)

1. No (go to Q. 46)
2. Yes

45-Do you feel the fact that your victim had been drinking influenced you in committing the crime ? (F108)

1. Made me less likely to commit the crime
2. Had no influence
3. Made me more likely to commit the crime

F. Six months prior to arrest

Now, we have some more questions about your drug use and the sorts of things that happened in your life as a result of your drug use during the 6 months before you were arrested.

46-Consider the 6 months before your arrest. Did you use drugs other than those required for medical reasons ? (C058)

1. No (Go to Q. 48)
2. Yes

47- Consider the 6 months before your arrest. How often did you use drugs for non-medical purposes ? (C028)

1. Not at all in the 6 months before my arrest
2. Once or a few times
3. About once a month
4. About once a week
5. A few times each week
6. Almost every day
7. Every day

48-Consider the 6 months before your arrest. Were you involved in a treatment program specifically related to drug use ? (C077)

1. No
2. Yes

49-Consider the 6 months before your arrest. After taking one or two drinks, could you usually stop ? (D093)

1. Yes
2. No

50-Consider the 6 months before your arrest. How much did you drink the last time you drank ? (D069)

1. Enough to get high or less
2. Enough to get drunk
3. Enough to pass out

G. Lifetime experience 2:

Next, think back over the course of your life. We would like to ask you how your drug or alcohol use were related to your illegal activities.

51-Think back to all of the times you have committed crimes in your life, including those for which you were never caught. For how many of these crimes would you say you were under the influence of drugs ? (F118)

1. None of my crimes
2. Not very many of my crimes
3. Some of my crimes
4. Most of my crimes
5. All of my crimes

52- Were you under the influence of drugs at the time of any of your previous crimes for which you are convicted ? (F119)

1. No
2. Yes, for some of them
3. Yes, for most of them
4. Yes, for all of them

53-Think back to all of the times you have committed crimes in your life, including those for which you were never caught. For how many of these crimes would you say that you were under the influence of alcohol ? (F120)

1. None of my crimes
2. Not very many of my crimes
3. Some of my crimes
4. Most of my crimes
5. All of my crimes

54-Were you under the influence of alcohol at the time of any of your previous crimes for which you were convicted ? (F121)

1. No
2. Yes, for some of them
3. Yes, for most of them
4. Yes, for all of them

ARRESTEE STUDY FORM

CANADIAN ASSOCIATION OF CHIEFS OF POLICE
R.C.M.P. - CANADIAN CENTRE ON SUBSTANCE ABUSE
INTERNATIONAL CENTRE FOR COMPARATIVE CRIMINOLOGY

ARRESTEE STUDY FORM

The Arrestee Study Form shall be filled out by the arresting officer at the time of arrest based on his/her **knowledge** or opinion of the circumstances surrounding the arrest

Police Service Reporting:_____ [1-2]

Sex of arrestee: Male ☐ Female ☐ [3]

Date of arrest: [4-11]
☐☐☐☐- ☐☐- ☐☐
Year - Month - Day

Age of arrestee: ☐☐ [12-13]

Hour of arrest: ☐☐☐☐ [14-17]
(*24 hour clock*)

Was the arrestee **under the influence of alcohol** at the time of the crime? [18]
(*Check one box only*)

Yes, definitely	☐1
Yes, probably	☐2
Probably not	☐3
Definitely not	☐4
Don't know	☐5

Is the arrestee an abuser of alcohol? [19]
(Check one box only)

Yes, definitely	☐1
Yes, probably	☐2
Probably not	☐3
Definitely not	☐4
Don't know	☐5

Was the arrestee **under the influence of an illicit drug** at the time of the crime? [20]
(Check one box only)

Yes, definitely	☐1
Yes, probably	☐2
Probably not	☐3
Definitely not	☐4
Don't know	☐5

If yes: What drug or drugs?
(You may check more than one box)

Heroin	☐1	[21]
Cocaine	☐2	[22]
Cannabis	☐3	[23]
Pharmaceutical drugs	☐4	[24]
Other drug(s)	☐5	[25]
_____ (*Specify*)		
Don't know	☐6	[26]

What **type of crime** is the suspect arrested for?
(You may check more than one box)

Homicide	☐1	[27]
Assault	☐2	[28]
Sexual assault	☐3	[29]
Theft	☐4	[30]
Auto theft	☐5	[31]
Impaired driving	☐6	[32]
Break &enter	☐7	[33]
Robbery	☐8	[34]
Fraud	☐9	[35]
Other crime	☐10	[36]
_____ *(Specify)*		
Double doctoring	☐11	[37]
Trafficking	☐12	[38]
Possession/purpose	☐13	[39]
Other drug crime	☐14	[40]
_____ *(Specify)*		

IF the crime is assault, sexual assault or homicide,

a) Is (are) the victim(s):

Spouse/common law	☐1	[41]
Other immediate family member	☐2	[42]
Relative	☐3	[43]
Stranger	☐4	[44]
Friend/Acquaintance	☐5	[45]
Other	☐6	[46]
_____ *(Specify)*		

b) Is (are) the victim(s)

Adult	☐1	[47]
Under 18	☐2	[48]

c) Did the crime result in injury or death to the victim(s)?

Death	☐1	[49]
Injury	☐2	[50]
Neither	☐3	[51]

Was the crime (at least in part) committed in orderto **obtain drugs for personal use**?
(Check one box only) [52]

Yes, definitely	☐1
Yes, probably	☐2
Probably not	☐3
Definitely not	☐4
Don't know	☐5

If yes: What drug or drugs?
(You may check more than one box)

Heroin	☐1	[53]
Cocaine	☐2	[54]
Cannabis	☐3	[55]
Alcohol	☐4	[56]
Pharmaceutical drugs	☐5	[57]
Other	☐6	[58]
_____ *(Specify)*		
Don't know	☐7	[59]

Was the crime (at least in part) committed **between persons involved in the drug trafficking economy** (including territorial disputes, collection of drug debts, etc.)?
(Check one box only) [60]

Yes, definitely	☐1
Yes, probably	☐2
Probably not	☐3
Definitely not	☐4
Don't know	☐5

Is the arrestee **an abuser of one or more illicit drugs**?
(Check one box only) [61]

Yes, definitely	☐1
Yes, probably	☐2
Probably not	☐3
Definitely not	☐4
Don't know	☐5

If yes: What drug or drugs?
(You may check more than one box)

Heroin	☐1	[62]
Cocaine	☐2	[63]
Cannabis	☐3	[64]
Pharmaceutical drugs	☐4	[65]
Other drug	☐5	[66]
_____ *(Specify)*		
Don't know	☐6	[67]