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RECENT FINDINGS  
FROM THE  
PROGRAM OF RESEARCH ON THE  
CAUSES AND CORRELATES OF DELINQUENCY

Prepared by

DENVER YOUTH SURVEY

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## INTRODUCTION

The Program of Research on the Causes and Correlates of Delinquency, started in 1986 with Office of Juvenile Justice and Delinquency Prevention support, is designed to better our understanding of serious delinquency, violence, and drug use. It does so through a series of coordinated longitudinal research projects: the Denver Youth Survey, the Pittsburgh Youth Study, and the Rochester Youth Development Study.

This Program of Research is broad-gauged, designed to look at a variety of risk and causal factors associated with delinquent behavior, ranging from individual-level characteristics to structural-level effects. For example, they include psychological factors and indicators of psychopathology, family structure and dynamics, school commitment and performance, peer relations and influence, and neighborhood or community effects. By looking at these and other factors over the life course our aim is to provide as comprehensive a view as possible about the development and course of delinquent careers. Ultimately, of course, our aim is to use this scientific information to develop new and better programs to prevent and treat juvenile delinquency.

To date, the Program of Research has produced a massive amount of information on the causes and consequences of delinquent behavior. Some of that information has been disseminated in an earlier OJJDP report, *Urban Delinquency and Substance Abuse: Initial Findings* (Huizinga, Loeber and Thornberry, 1994). That report -- both the brief Executive Summary and the much longer Technical Report -- examined many issues related to delinquency and drug use. It examined the epidemiology of these behaviors, the overlap or co-occurrence of problem behaviors, the role of such factors as family, school, peer, and neighborhood effects in the etiology of delinquency, and it developed appropriate policy implications from the findings. In addition to that collaborative report, each of the projects has disseminated the results of its research in a variety of publications, reports, and presentations.

The purpose of the present report is to disseminate current findings of the Program of Research on the Causes and Correlates of Delinquency. Results of collaborative work replicated across the three projects are presented, as well as a series of special topics examined by one of the three projects. This dual approach allows us to extend the range of topics covered.

There is a general, albeit not exclusive, focus in this report on violent behavior. We have selected this focus because of the level of youth violence that is confronting our country today. The volume of crime and violence has escalated dramatically over the last half of this century and, by any standard, current rates are unacceptably high.

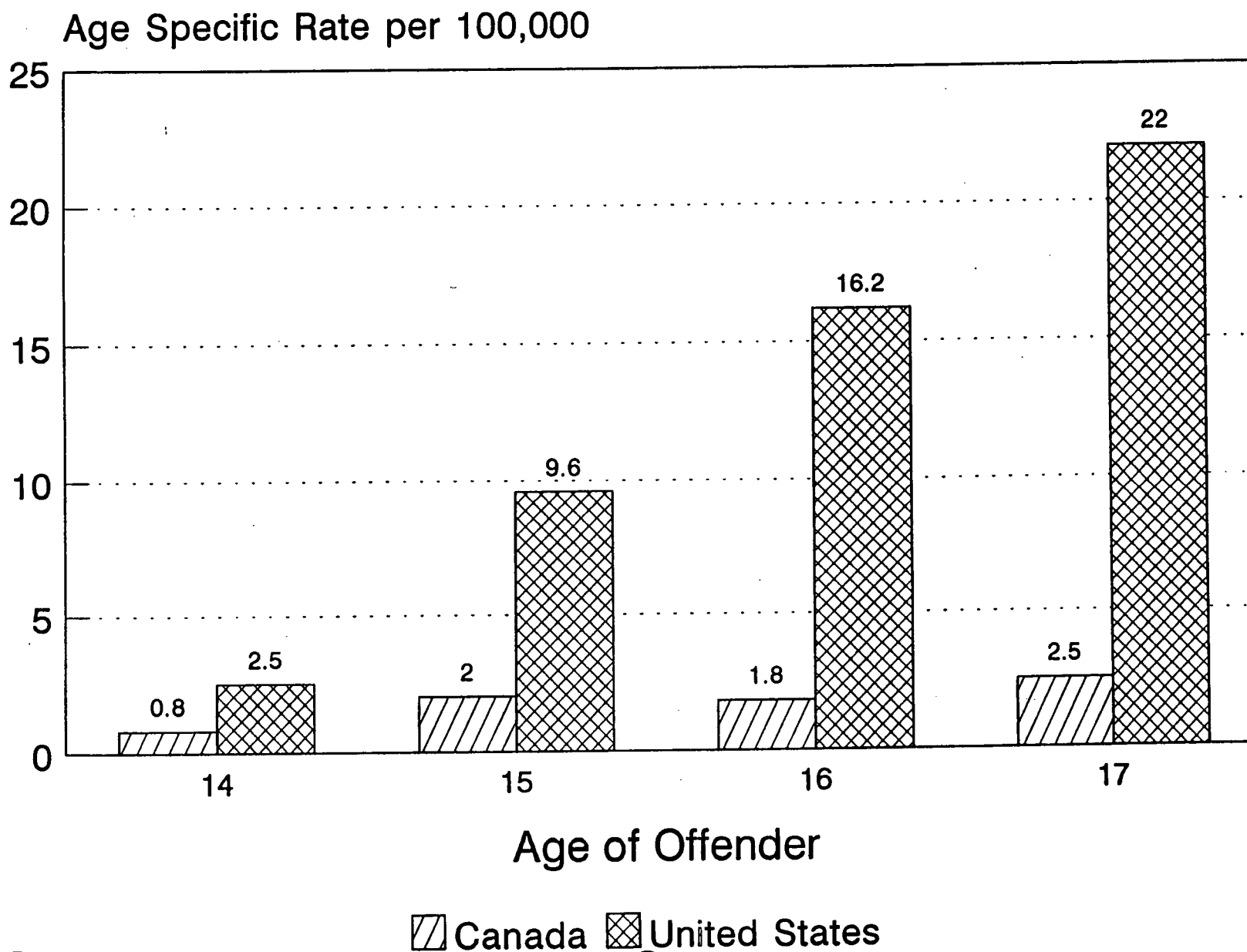
As compared to adolescents in other countries, American teenagers exhibit alarmingly high rates of violence (Figure 1). Rates for American seventeen year olds are almost 10 times those of Canadian seventeen year olds. The rate for fourteen year old Americans is equal to that of seventeen year old Canadians.

Even starting from a high baseline, the rate of youth violence has increased substantially in recent years. Between 1989 and 1993, for example, the number of arrests of juveniles committing a violent crime increased by 36 percent, more than four times the increase observed for adults. More importantly, perhaps, juvenile arrests for murder increased by 45 percent, while adult homicide arrests increased by 6 percent (F.B.I., 1995).

Youth are not only overrepresented as violent offenders, they are also overrepresented as victims of violent crimes. For Americans aged 15 to 19, homicide by gunfire is the second leading cause of death, exceeded only by traffic accidents. Juveniles account for one-tenth of the population age 12 and over, but about one-quarter of all victimizations involve a juvenile. In addition, the rate of victimization among the 12-17 year old population has been increasing. Among this population the violent victimization rate per 1000 persons has risen from 60.6 in 1987 to 74.2 in 1992 (Moone, 1994). Although youth violence affects all segments of American society, it has particularly devastating effects on the African-American community. Homicide has long been the leading cause of death among young African-American males. In 1987, for example, the death rate per 100,000 population aged 15-19 due to firearm homicides for African-American males was 49.2; the same rate for whites was only 5.1 (Fingerhut, 1993).

Rates of criminal violence, including youth violence, have clearly reached unparalleled levels in American society (see Thornberry, Huizinga and Loeber, forthcoming, for a more general discussion of this point). Because of that, we think it is appropriate to focus our attention on this issue in this year's report from the projects of the Program of Research on the Causes and Correlates of Delinquency.

**Figure 1. Average Young Homicide Offender Rates, Canada, 1961-1990; United States, 1965-1990**



Source: Canadian data - Silverman and Kennedy (1993)

U.S. data - Blumstein (1984)

## **PROGRAM OF RESEARCH ON THE CAUSES AND CORRELATES OF DELINQUENCY**

The projects of the Program of Research are based on longitudinal designs since there is general agreement among social scientists and policymakers that they are the best way to gain information on the causes of delinquency (Farrington et al., 1986). This type of investigation involves repeated contacts with the same individuals, preferably over long portions of the life course, so that patterns of development can be studied. In particular, the study of changes in individual offending allows us to examine potential causal factors that may influence those changes.

The strength of the longitudinal investigation is that it permits identification of those factors that precede changes in offending, that predict such changes, and that does so independent of other factors. With the aid of repeated measures, it is possible to identify pathways to delinquency, each with unique causal factors that, like delinquency itself, may change over time. The successful mapping of delinquent careers, together with identifying causal factors, will provide the information needed to develop more effective intervention programs.

The three projects of this Program of Research selected a total of 4,500 inner city youth for study. At the beginning of data collection (1988) they ranged in age from seven to fifteen years of age. Because of the low base rates of serious, chronic delinquency (see, for example, Wolfgang, Thornberry, and Figlio, 1987), youngsters at high risk for delinquency were overrepresented in the samples. The three samples are probability samples, however, and can be weighted to represent the general populations from which they are drawn. With the exception of the data on developmental pathways, the results in this report are based on weighted data.

As of Spring 1994 these subjects have been followed for at least six years, with assessments occurring at regularly scheduled intervals (see below). Sample retention has been excellent; at least 84 percent of the subjects have been retained at each of the sites and the average rate of retention across all waves is 90 percent. In addition, there is virtually no differential attrition and the respondents who remain appear to be a representative set of the total panels (see, for example, Thornberry et al., 1993; Huizinga, forthcoming).

In addition to face-to-face interviews with the focal subject, we have interviewed each subject's primary caretaker, also at regular intervals. To date we have conducted well over 60,000 personal interviews in our effort to understand the developmental dynamics of delinquent behavior. The interviews with the adolescents and their caretakers are comprehensive and cover a wide range of social, psychological, and behavioral arenas.

We believe that this collaborative effort represents a milestone in criminology because it constitutes the largest shared-measurement approach ever achieved in delinquency research. All core theoretical concepts are measured identically at all three sites. For example, the following content areas are part of our "core measurement package":

- Official and self-reports of delinquent, including violent behavior.
- Self-reports of drug use.
- Characteristics of the community and neighborhood.
- Demographic characteristics of the family.
- Parental attitudes and child-rearing practices.
- Youth/child attitudes, school performance, and perceived consequences of delinquency.
- Peer delinquency and conventional activities.

Our common measurement strategy will enable us to aggregate data across projects and to replicate findings across sites, thus ensuring that findings apply in more than one specific site before drawing conclusions. In addition to the common measures, each project also collects unique measurements that are expected to add special yields to the findings from each site.

Finally, we have collected extensive data from the files of such agencies as schools, police, courts, and social services. In combination, the Program of Research on the Causes and Correlates of Delinquency has collected extensive information on large samples of high-risk youth covering a relatively large portion of their life course.

Although there is great commonality across the projects of the Program of Research on the Causes and Correlates of Delinquency, each project has some unique design features. A brief description of each design follows:

## **DENVER YOUTH SURVEY**

The Denver Youth Survey is based on a probability sample of households in "high risk" neighborhoods of Denver, Colorado. The neighborhoods were selected on the basis of a social-ecology analysis of population and housing characteristics associated with delinquency and by higher than average crime rates. The survey respondents include 1527 youth (806 boys and 721 girls) who were 7, 9, 11, 13, and 15 years old in 1988, and one of their parents, that lived in one of the more than 20,000 randomly selected households.

Each child or youth and parent were interviewed annually over a five year period, from 1988 to 1992. Respondents who moved anywhere in the United States continued to be included in the survey. Each interview was conducted in a private setting and lasted one to two hours. The selection of ages of the child and youth respondents reflects the "accelerated longitudinal design" of the survey, so that after the first five years of the survey, developmental sequences across the full 7 to 19 year old age range can be examined. Arrest data covering this five year period has also been obtained from the Denver Police Department. In addition to the core measures of the Program of Research, the project includes an extensive focus on female delinquency, neighborhoods, school environment, mental health issues, gang involvement, problem drug use, and victimization.

The Denver Youth Survey will continue to follow the survey respondents in annual surveys through 1999, when the respondents will be 18-26. The study will then have prospective longitudinal data covering the 7 to 26 year old age span, allowing examination of the effects of childhood experiences on adolescent outcomes and the effects of both child and adolescent experiences on young adult outcomes.

The Pittsburgh Youth Study was started in the Spring of 1986. Boys attending the first, fourth, and seventh grades in the Pittsburgh Public School system were randomly selected for participation in a longitudinal study of the development of delinquent and disruptive behaviors (called the youngest, middle, and oldest samples, respectively). Of those subjects contacted, 84.7 percent of the boys and their caretakers agreed to participate. An initial screening then followed which consisted of a retrospective assessment of problem behaviors, as reported by the boy, his parent, and his teacher. Boys in the youngest and middle samples initially were administered the Self-Reported Antisocial questionnaire (SRA) (Loeber et al., 1991), and the oldest sample the Self-Reported Delinquency questionnaire (SRD) (adapted from Elliott, Huizinga, & Ageton, 1985). The parent and the teacher filled out extended versions of the Child Behavior Checklist (Achenbach, 1983).

The information from this screening was used to generate a sample with a higher base rate of delinquent behavior than the average community sample. The top 30 percent, approximately 250 boys, with the highest rates of disruptive behavior were selected from each of the three samples, and an equal number of the remaining 70 percent were randomly selected. Thus, about 500 boys from each of the three grade samples qualified for the follow-up assessments.

Follow-up took place initially at half-yearly intervals (i.e., eight half-yearly assessments for the youngest sample and six half-yearly assessments for the middle and oldest samples). Subsequently, the middle sample was discontinued, but follow-up in the youngest and oldest samples continued at yearly intervals.

At each of the follow-up assessments, the boys and their primary caretaker were interviewed individually and assessments were completed by the boys teacher. In addition to the core measures of the Program of Research, the project includes extensive data on childrearing practices, educational performance, impulsivity, neurocognitive performance, lead toxicity, the characteristics of fathers of the boys, and neighborhood characteristics. Also school records of the boys' academic performance, records from the juvenile court and the police about the boys' delinquent involvement and, most recently, records of child abuse and neglect from the Children and Youth Authority were obtained.

Current funding allows for the follow-up of the boys in the youngest and oldest samples until 1995. By that time, boys in the youngest sample (who were first assessed at the age of 7) will be on average 15 years old, while boys in the oldest sample (first assessed at the age of 13) will be on average 20.5 years old.

## **ROCHESTER YOUTH DEVELOPMENT STUDY**

The Rochester Youth Development Study started with a sample of 1,000 students attending the seventh and eighth grades of the Rochester, New York public schools in 1988. To maximize the number of serious, chronic offenders available for the study, the sample includes proportionately more youth from high-crime neighborhoods and proportionately fewer from low-crime neighborhoods. Also, the sample is 75 percent male and 25 percent female. The entire cohort of seventh and eighth grade students is represented in the study, however, and the data are weighted to represent that population.

Each student and his or her primary caretaker were interviewed at six month intervals between 1988 and 1992. This provided nine data collection points over this 4 1/2-year period. If the family moved or if the child left school, they remained in the study and continued to be interviewed. Each interview lasted approximately one hour. In addition, data were collected from a variety of Rochester agencies including the schools, police, courts, and social services. Overall, this provided a very thorough picture of adolescent development during the junior and senior high school years. (A more detailed discussion of sampling and data collection procedures can be found in Thornberry et al., 1993.)

In addition to the theoretical issues covered by the core measures of the Program of Research on the Causes and Correlates of Delinquency, the Rochester Youth Development Study examines a number of other topics related to delinquency and drug use. These include such issues as patterns of gun ownership and gun use, the presence and extensiveness of childhood maltreatment, the social network characteristics of adolescent drug users, gang involvement, and social reactions to adolescent delinquency and drug use. These "special" topics allow the project to extend the breadth of research issues that can be addressed by the Program of Research on the Causes and Correlates of Delinquency.

The Rochester Youth Development Study will continue to follow the members of this panel through 1997, with annual data collection efforts planned between now and that time. The new data collection will trace the panel members through the crucial transition period from adolescence to early adulthood. Overall, the study will have prospective, longitudinal data on these subjects from the time they were 13 and 14 years old until they are 22 and 23 years old.

## RESEARCH FINDINGS

In this section current findings from the Program of Research are described. The first two sections, The Epidemiology of Violence and Chronic Violent Offenders illustrate the joint findings across all three projects. These are followed by a sequence of reports on special topics from each project.

### THE EPIDEMIOLOGY OF SERIOUS VIOLENCE

Much prior research has indicated that the commission of violent acts by adolescents is not evenly distributed in our society. Levels of involvement have been shown to vary by age, by sex, and by ethnic group, and the findings of the Program of Research about the demographic characteristics of adolescent violent offenders are in general agreement with this prior research. To examine levels of involvement in violence, a measure of serious violence incorporating aggravated assault, robbery, gang fights, and rape was constructed. This measure was adjusted to remove reports of trivial or non-serious incidents. Using weighted samples at each site, so that reported data reflect the populations from which the samples were drawn, the proportion of juveniles committing a serious violent act (Prevalence) and the mean number of serious violent acts committed by these active offenders (Offending Rate) were calculated at each site for different age by sex groups. These results are tabulated in Tables 1 and 2.

In these tables, the sites are labelled: D-Denver, P-Pittsburgh, and R-Rochester. Because the three sites have samples of different ages, some table entries are blank if data for a particular age is not currently available at a given site. Also, if for a given age, the number of active offenders at a site was too small to permit calculation of a reliable estimate of an offending rate, a "dash" is entered in the corresponding table cell.

As seen in Tables 1 and 2, in general, a greater percentage of boys are involved in serious violence than are girls and, on the average, an active male offender commits more serious violent acts than does an active female offender. In the early teenage years (13-15) however, the prevalence of serious violence among girls approaches that of boys in Denver, and in Rochester, even exceeds that of boys at age 13. Clearly, during adolescence, involvement in serious violent behavior is not limited to males, and concern about violence by both sexes is warranted.

Differences across ethnic groups are also clearly seen in Table 1. In general, a

**Table 1. Prevalence of Serious Violence By Age, Sex, and Ethnicity\***

<u>Age</u>	<u>Males</u>			<u>Females</u>	
	D	P	R	D	R
10	.02	.07		.01	
11	.05	.11		.02	
12	.08	.08	.19	.03	.15
13	.10	.17	.16	.06	.18
14	.12	.17	.22	.07	.18
15	.15	.15	.19	.07	.13
16	.18	.13	.17	.05	.06
17	.18	.17	.17	.04	.04
18	.19		.20	.03	.07
19	.21			.01	

<u>Age</u>	<u>African American</u>			<u>Hispanic</u>		<u>White</u>		
	D	P	R	D	R	D	P	R
10	.02	.08		.01		.00	.05	
11	.05	.13		.04		.02	.08	
12	.07	.11	.21	.06	.14	.03	.05	.05
13	.07	.20	.23	.07	.12	.03	.10	.05
14	.11	.20	.25	.11	.14	.03	.14	.08
15	.13	.17	.20	.12	.13	.02	.12	.07
16	.14	.19	.13	.12	.10	.01	.04	.09
17	.15	.19	.10	.10	.20	.01	.11	.05
18	.15		.15	.07	.14	.01		.19
19	.13			.12		.00		

\*Pittsburgh data includes only males

**Table 2. Serious Violence: Mean Offending Rates of Active Offenders By Age and Sex\***

<u>Age</u>	<u>Males</u>			<u>Females</u>	
	D	P	R	D	R
10	1.6	2.6		-	
11	3.5	3.3		-	
12	3.3	2.8	4.0	3.3	-
13	10.1	3.3	6.9	1.5	2.7
14	10.4	4.1	7.2	2.4	5.5
15	7.7	4.9	5.7	2.3	5.4
16	11.8	6.7	5.3	2.1	4.5
17	10.9	8.6	3.7	1.4	-
18	12.0		5.8	1.0	-
19	8.7				

\*Pittsburgh data includes only males

greater proportion of minorities are involved in serious violence. With one exception, prevalence rates are higher among minority groups than among whites at each age, and these differences are often substantial.

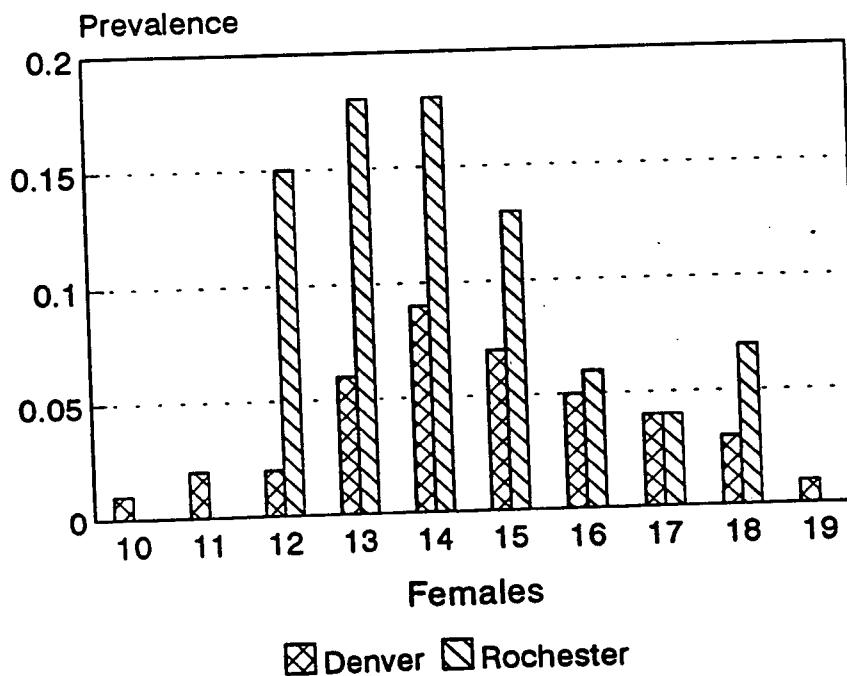
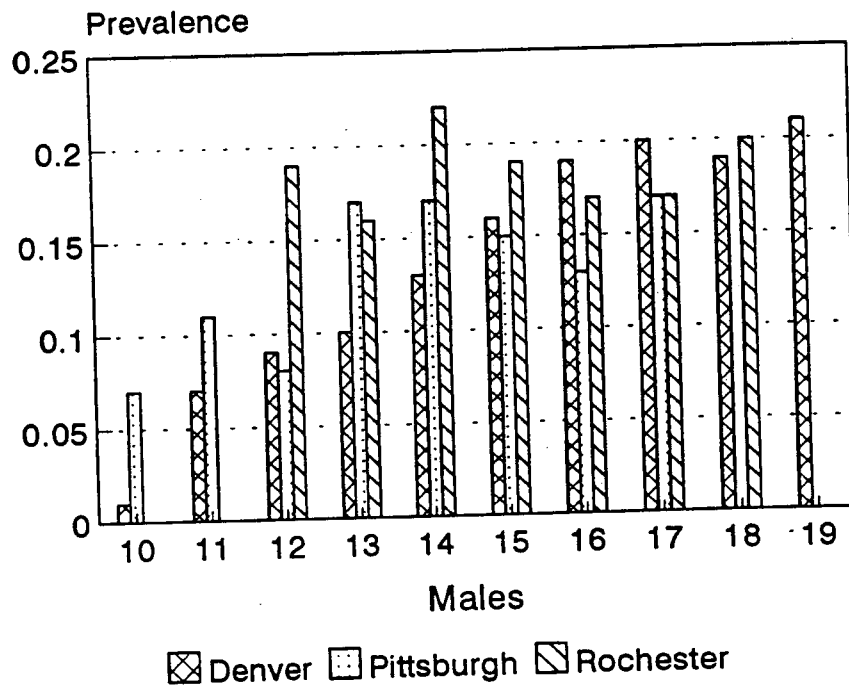
Gender differences in mean offending rates among those who are active offenders can be seen in Table 2. In Denver, active male offenders generally commit more violent offenses than active female offenders. However, differences between boys and girls in Rochester are much smaller, especially in the mid-teen years.

As pictured in Figure 2, there is also a clear difference in the age curves of serious violence between the sexes. The girls show an expected age curve with prevalence rates peaking in mid-adolescence (13-15), and generally declining thereafter. In contrast, for boys, there is no decline in late adolescence. The analyses of serious violent prevalence rates for boys show a different pattern than has been found in other studies of individual offending. Previous studies have generally found male prevalence rates to peak at ages 15-17, unlike arrest rates which generally have been found to peak at ages 18-19. However, data from all three sites show no decline in males' self-reported serious violent offending in late adolescence. These prevalence rates remain high (17-20%) across the 17-19 age period. Whether an anticipated age curve will be found for males in the future requires analysis of additional years of data that are presently being collected at each site.

The age curves also indicate that a small but substantial proportion of boys and girls are involved in serious violence, even before becoming teenagers. In fact, at age 12 in Rochester, 19% of the boys and 15% of the girls report involvement in these behaviors, while in Denver and Pittsburgh the numbers are smaller but still substantial. For some youth, serious violence begins early.

It also can be observed that a relatively large proportion of boys and a somewhat smaller proportion of girls are involved in serious violence sometime before the late teen years. This is illustrated by the cumulative prevalence of serious violence across ages in Table 3. In this table, using similar aged cohorts at the three sites, the proportion of youth who have engaged in serious violence sometime prior to or at a specific age is provided. As seen in the table, by age 16, at all three sites, approximately 40% of males have committed one or more serious violent acts. In Rochester and Denver, the corresponding rates for females is also substantial, 32% and 16% respectively. While this does not mean

**Figure 2. Prevalence of Serious Violent Behavior**



**Table 3. Cumulative Prevalence of Serious Violence**

	Denver		Rochester		Pittsburgh
<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>
13	.10	.08	.17	.22	.18
14	.21	.13	.26	.25	.30
15	.30	.14	.32	.28	.37
16	.39	.16	.40	.32	.41
17	.43	.16			.44

that all of these youth are continuously involved in violence, it does indicate that a large proportion of our teenagers have engaged in serious violent acts.

It should also be noted that although violence is a stable trait for some persons, there is an intermittent quality to violent offending. For example, based on data from the first five waves of the Denver Youth Survey it was found that 42% of violent offenders were active offenders during only one year and suspended or terminated their involvement in the remaining four years. Among multiple year offenders there are various temporal patterns of involvement. For careers that last three or more years, the most frequent pattern is sporadic offending. That is, well over half of these multiple year offenders are not active every year. In fact, about seventy five percent of those whose involvement spans the full five years are characterized by such intermittent patterns of offending. Clearly these offending patterns give caution to interpreting the behavior at any one given year as characteristic of or identifying violent or non-violent individuals.

In many ways, these findings about prevalence and offense rates mirror those of prior research. Of importance, however, is the delayed and currently absent decrease in prevalence of serious violence among males during the late teenage years, the observation that serious violence is a problem to be recognized among both boys and girls, and that for some youth, involvement in serious violence begins at a very young age.

## CHRONIC VIOLENT OFFENDERS

In the previous section we saw that many adolescents engage in violent delinquency. Not all youth who are violent are equally violent; however, some adolescents engage in only a few acts of violence while growing up, but others engage in violence frequently and repetitively. The latter group is often referred to as either persistent or chronic violent offenders. In this section we examine their distribution in the population and a few of their characteristics.

The left hand pie-charts in Figure 3 demonstrate that chronic violent offenders<sup>1</sup> constitute a very small percentage of the total population. The estimates are remarkably consistent across the three study sites. In Denver 14% of the sample are classified as chronic violent offenders, in Pittsburgh 19% are, and in Rochester 15% are.<sup>2</sup>

While constituting a relatively small proportion of the population, chronic violent offenders are responsible for the vast majority of all violent crimes. (See right hand pie-charts). Again, the estimates are remarkably similar across sites. In Denver chronic violent offenders account for 82% of all of the self-reported violent crimes. In Pittsburgh the comparable statistic is 77% and in Rochester it is 75%. Clearly a relatively small number of people are responsible for a very large number of violent crimes.

Figure 4 displays the number of violent offenses reported by the adolescent respondents over a four year period. In Denver the chronic violent offenders self-reported a total of 4,237 violent offenses, in Pittsburgh they reported 6,061, and in Rochester they reported 4,134. If one were to extrapolate these numbers from these three cities to cover the total population of the United States, it would be clear that chronic offenders, while small in number, inflict a substantial degree of social harm on society.

### Characteristics

Chronic violent offenders have a number of intriguing characteristics. In Figure 5 we look at the relationships between age of onset for violent offending and the likelihood of being a chronic violent offender. Age of onset is the offender's age at the time of their first violent offense.

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<sup>1</sup> Chronic offenders are those in the top one quarter of the cumulative frequency distribution of self-reported violence among active offenders.

<sup>2</sup> In this section the Pittsburgh data are based on information about the oldest cohort only.

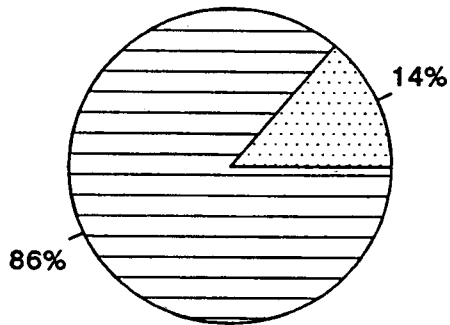
Figure 3

## Chronic Violent Offenders ...

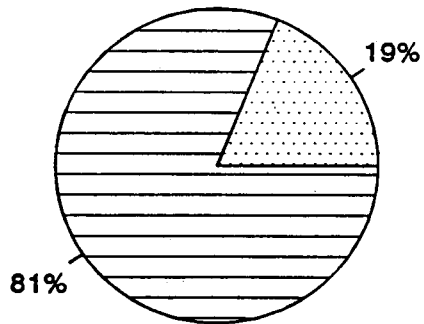
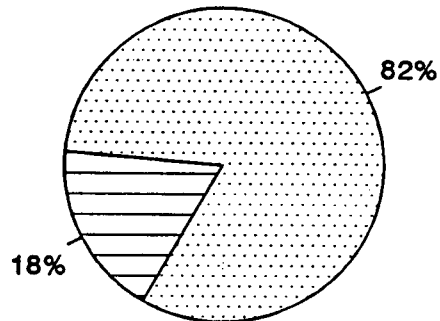
Constitute a Small  
% of the Sample

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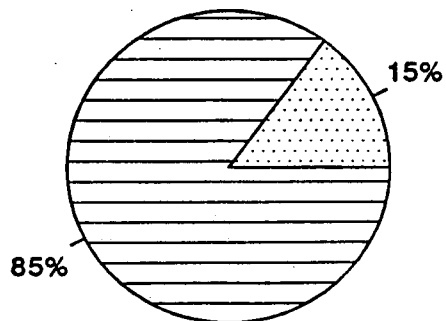
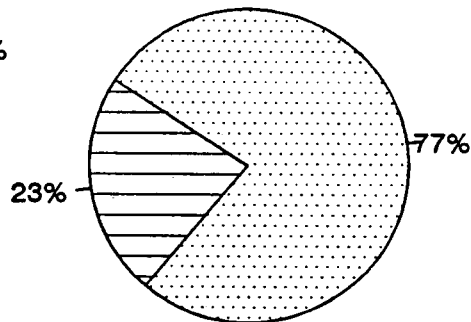
Account for a Large  
% of Violent Offenses



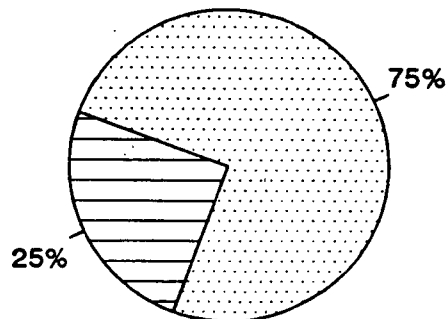
(Denver data)



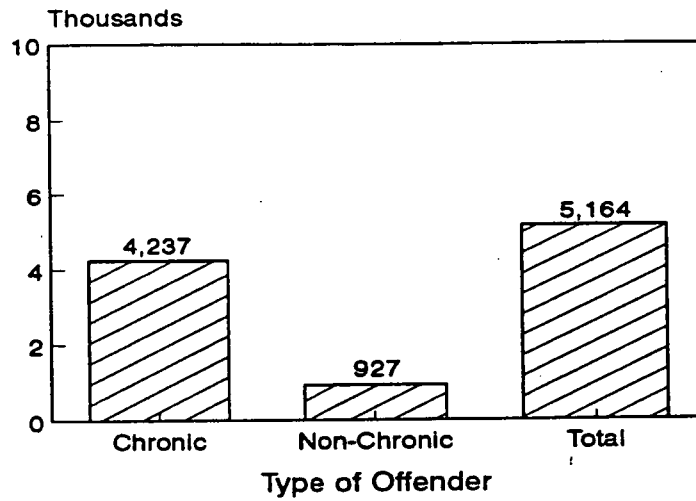
(Pittsburgh data)



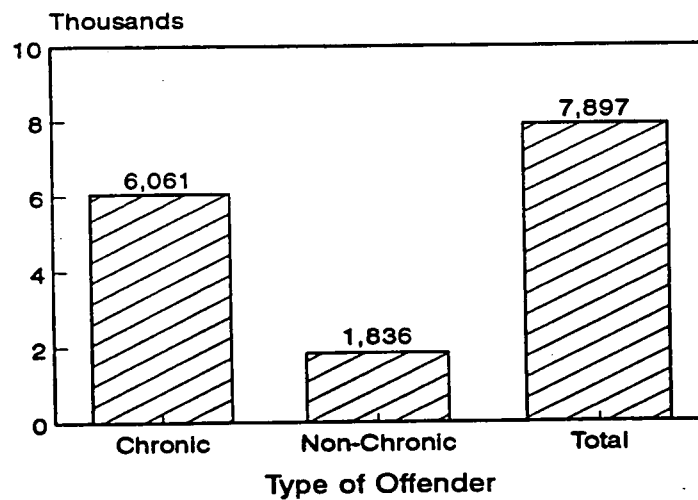
(Rochester data)



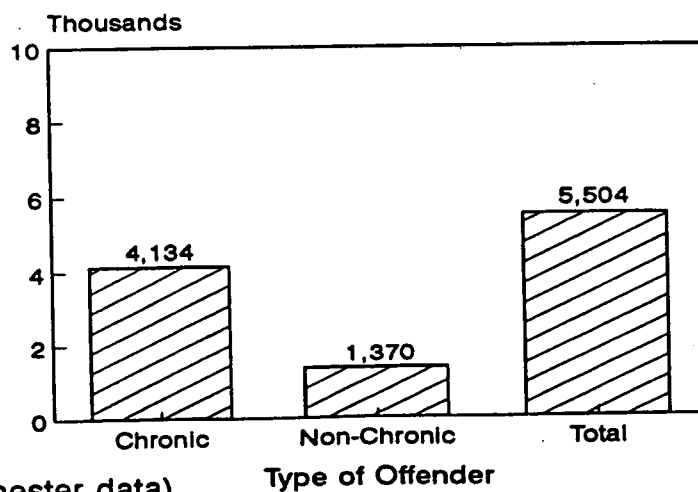
**Figure 4. Total Number of Violent Offenses Reported, by  
Type of Violent Offender over a four year period**



(Denver data)

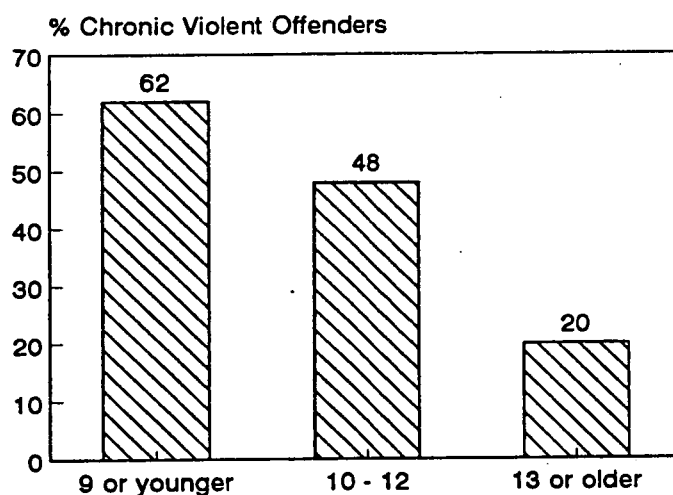


(Pittsburgh data)

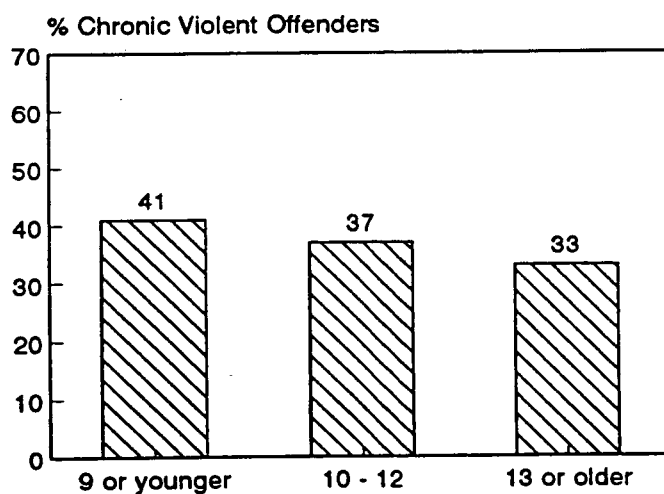


(Rochester data)

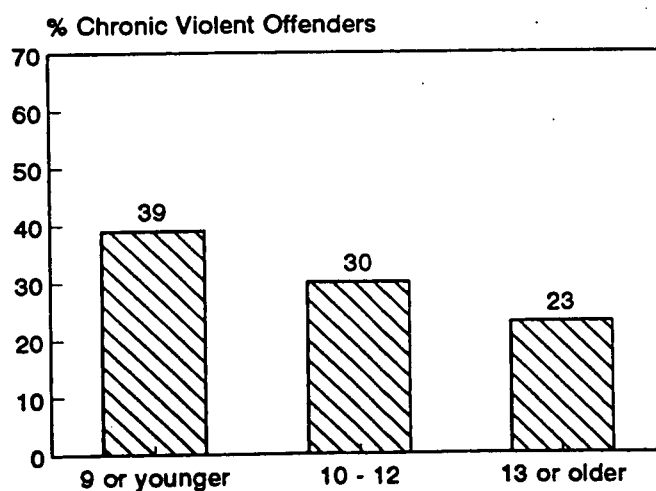
**Figure 5. Relationship Between Age of Onset of Violent Offending and Prevalence of Chronic Violent Offending**



(Denver data) Onset of Violent Delinquency



(Pittsburgh data) Onset of Violent Delinquency



(Rochester data) Onset of Violent Delinquency

Although the absolute values of the percentages vary somewhat from project to project, the pattern of results is quite consistent. In all three cities the respondents with the youngest ages of onset are most likely to become chronic offenders. In Rochester for example, 39% of the youngsters who commit their first violent offense at age nine or younger eventually become chronic offenders. This compares to 30% for those who begin offending between the ages of ten and twelve and 23% for those who begin at age thirteen or after. The respective percentages for Denver are 62%, 48% and 20%; and for Pittsburgh they are 41%, 37% and 33%. (In results not shown here, we saw that using the age of onset of general delinquency, instead of violent delinquency, produced very similar results.)

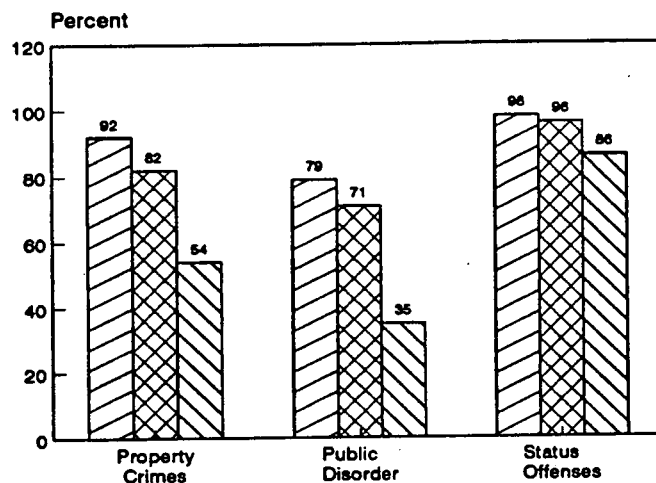
In addition to their early start, chronic violent offenders are also quite versatile, as shown in Figures 6 and 7. In Figure 6 we examine involvement in other forms of delinquency, by type of violent offender. Again there are some differences in the magnitudes of the percentages across the projects, but the pattern of results is quite clear.

We can begin by looking at property crimes. In Rochester, for example, 82% of the chronic violent offenders also report committing property crimes. This compares to 54% of the non-chronic violent offenders and just 18% of the respondents who reported no involvement in violence. Perhaps the most important result is simply the percentage of chronic violent offenders who also commit property offenses - 82%. The comparable percentage in the other two cities is 92. In other words, the vast majority of chronic violent offenders are also likely to commit property crimes.

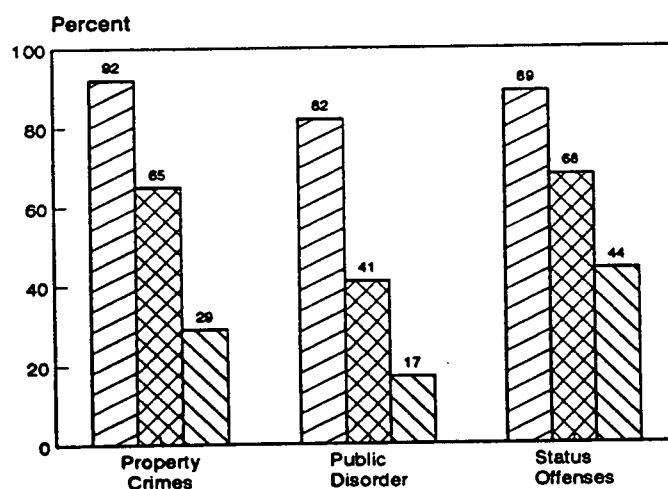
Two other forms of delinquency are examined in Figure 6 - public disorder offenses and status offenses. The story is quite similar. The majority of chronic violent offenders commit public disorder offenses (in Denver 79%, Pittsburgh 82%, and Rochester 71%) and are status offenders (in Denver 98%, Pittsburgh 89%, and Rochester 82%). In all three cities non-chronic violent offenders are less likely to engage in these other forms of delinquency and non-violent respondents are least likely.

Figure 7 presents similar results for three measures of drug involvement - drug sales, alcohol use and marijuana use. Drug sales has a low base-rate at these ages but the chronic violent offenders are far more apt to report selling drugs than are the other two groups. In Denver 45% do, in Pittsburgh 26% do, and in Rochester 37% do. Chronic violent offenders are also the most likely to report using alcohol and marijuana.

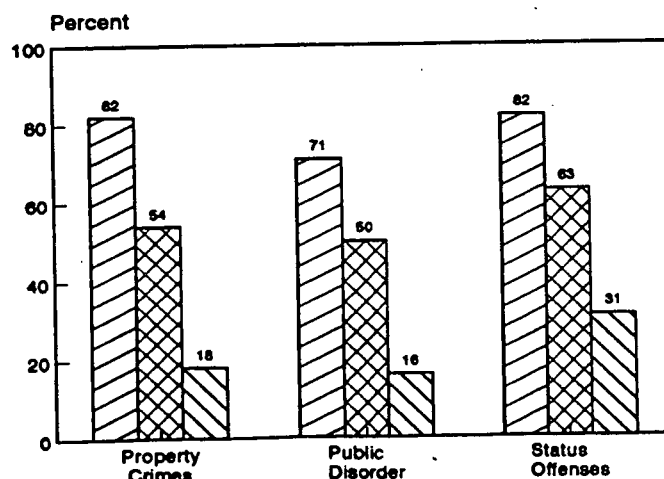
**Figure 6. Involvement in Other Forms of Delinquency for Types of Violent Offenders**



(Denver data) Chronic Violent Non-Chronic Violent Non-Violent

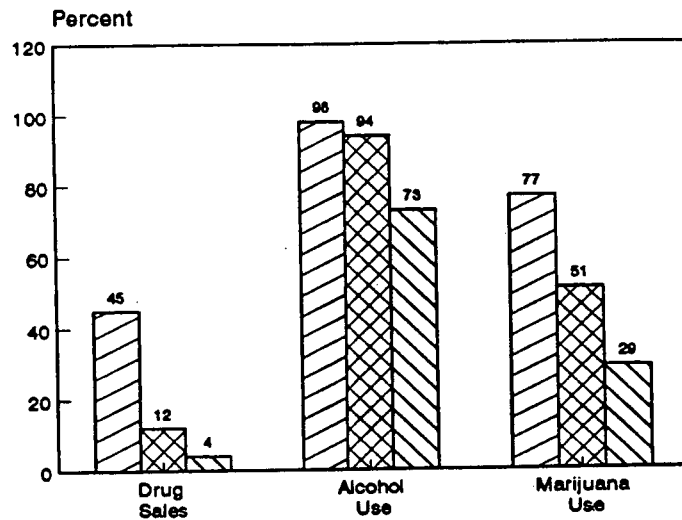


(Pittsburgh data) Chronic Violent Non-Chronic Violent Non-Violent

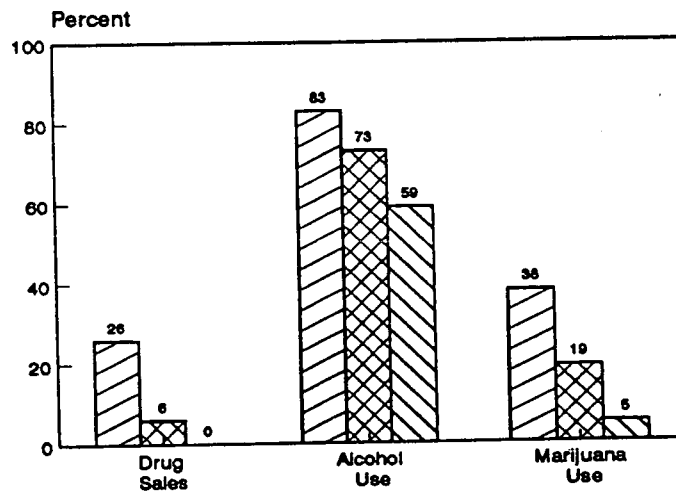


(Rochester data) Chronic Violent Non-Chronic Violent Non-Violent

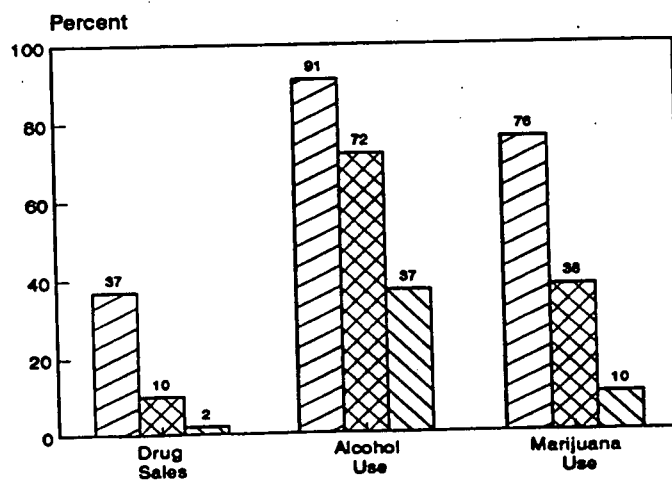
**Figure 7. Involvement in Drug Use and Sales for Types of Violent Offenders**



(Denver data) ☒ Chronic Violent ☒ Non-Chronic Violent ☐ Non-Violent



(Pittsburgh data) ☒ Chronic Violent ☒ Non-Chronic Violent ☐ Non-Violent



(Rochester data) ☒ Chronic Violent ☒ Non-Chronic Violent ☐ Non-Violent

### Arrests of Chronic Violent Offenders

Given the offending patterns of chronic violent offenders, it seems likely that because of their behavior a large proportion of these youth would, at some time in their career, be arrested. Data from the three sites are used to examine the prevalence and timing of arrest or police contact. In Rochester, arrest is measured by data drawn from the records of the Rochester Police Department. During the juvenile years it includes all official contacts that result "in a warning and release" or further penetration in the juvenile justice system and during the adult years it covers all arrests. In Denver, self-report data about arrests, including "tickets" for delinquent acts, is used to measure arrest history. In Pittsburgh, official arrest data are used.

Table 4 presents information on the proportion of youth who have been arrested by chronic violent offender status. While only about one-quarter of the non-violent offenders had been arrested at each of the sites, in Rochester about two thirds (62.4%) and in Denver and Pittsburgh about three-quarters (72.1% and 77.4%, respectively) of chronic violent offenders had been arrested. While chronic violent offenders have a high likelihood of being arrested and therefore coming into contact with juvenile justice system and its services, it should also be noted that a substantial proportion of these serious and repeat offenders had no contact with the juvenile justice system. Indeed, roughly one-quarter to one-third of them had no arrest record by age 18.

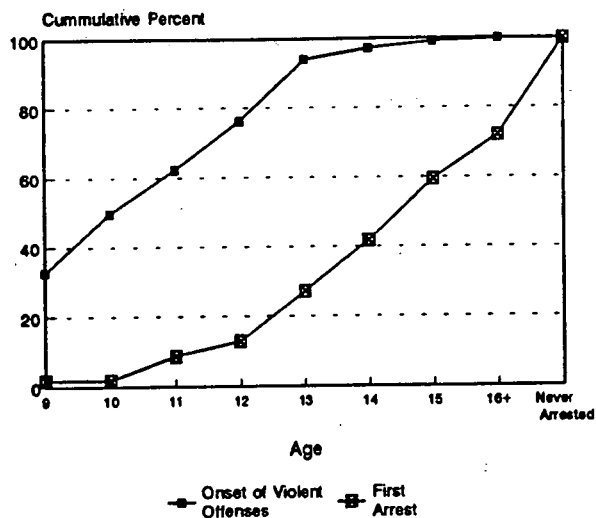
Figure 8 presents data on the age of onset of violent offending and age at first arrest, for the chronic violent offenders only. In general, these data suggest that these offenders begin their criminal careers at younger ages than when they are first arrested. By age nine, 15.8 percent of the chronic violent offenders in Rochester and 32.6 percent of the chronic violent offenders in Denver had already reported involvement in violence but only 2.5 percent had been arrested. By age twelve, 36.7 percent in Rochester, 76.1% in Denver and 17.5% in Pittsburgh had begun to commit violent offenses but only about 13-15 percent at any site had been arrested, and by age fourteen, fully 81.2 percent, 97.2 and 74.1 percent of the chronic violent offenders had begun committing violent offenses but only slightly more than one-third of them in Rochester and Denver and about half of them in Pittsburgh had been arrested.

Overall, at all three sites, a substantial proportion of the chronic violent offenders, about

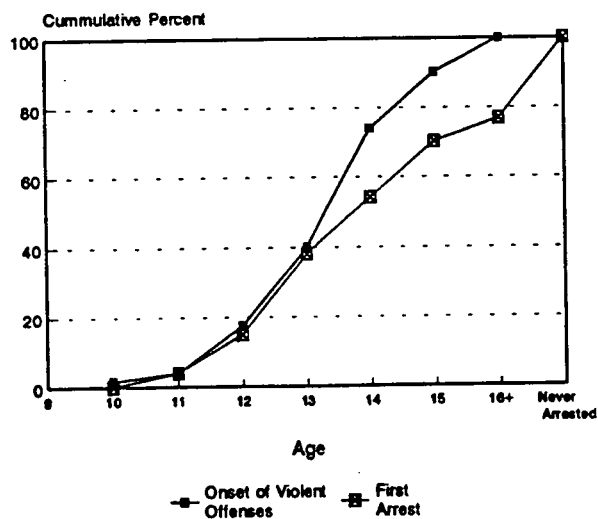
**Table 4. Prevalence of Arrest by Chronic Violent Offender Status**

	<u>Non- Violent</u>	<u>Non-Chronic Violent</u>	<u>Chronic Violent</u>
<u>Percent with Arrest History</u>			
Rochester	23.1	45.8	62.4
Denver	29.7	57.1	72.1
Pittsburgh (Oldest Cohort)	27.9	41.1	77.4

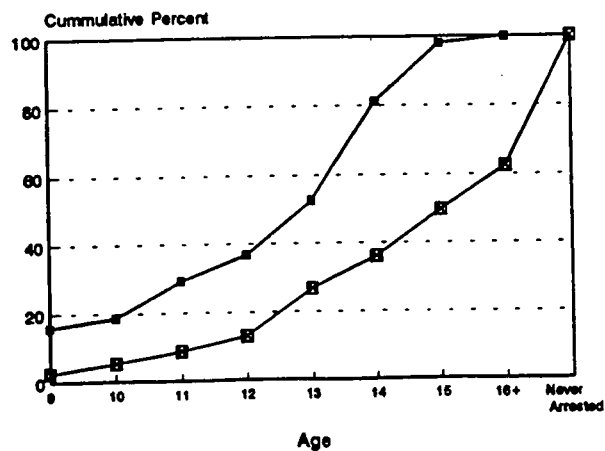
**Figure 8. Relationship Between Age of Onset of Violent Offending and Age at First Arrest For Chronic Violent Offenders**



(Denver data)



(Pittsburgh data)



(Rochester data)

one-quarter to one-third were never arrested and of those who had been arrested, the first arrest occurred well after their violent careers had begun. As a result, the interventions offered by the juvenile justice system may be too late to easily alter the development of these serious, repetitive violent careers, and both early prevention and intervention as well as later treatment for apprehended offenders seems clearly warranted.

### Summary

Chronic violent offenders constitute a very interesting and important group. While proportionately rather small, they account for the vast majority of all violent offenses. They begin their offending careers earlier than average and they are heavily involved in other forms of delinquency and drug crimes. Given the volume and versatility of their offending it seems clear that reductions in the overall level of crime in society will not come about unless the behavior of this small group is successfully prevented. We have examined this issue in greater detail in another program publication (Thornberry et. al., forthcoming) and refer the reader there for additional information.

## GANGS AND DELINQUENCY

A great deal of prior research has demonstrated a strong relationship between gang membership and delinquent behavior. Members of street gangs are much more heavily involved in delinquency, especially serious and violent delinquency, than are youth who are not gang members (see Spergel, 1990, for a general literature review). This basic finding has been replicated by the projects of the Program of Research on the Causes and Correlates of Delinquency (Esbensen and Huizinga, 1993; Thornberry et al., 1993).

Although the relationship between gang membership and delinquency is one of the strongest that is found in the research literature on delinquency, surprisingly little is known about the mechanisms that bring it about. There are at least three models that could account for this association. They are:

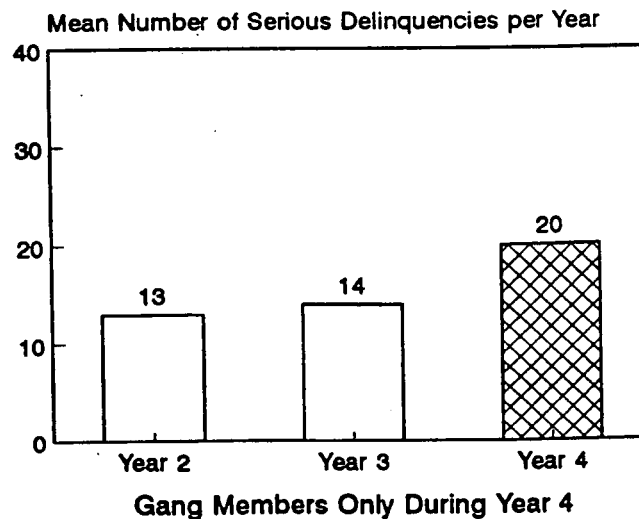
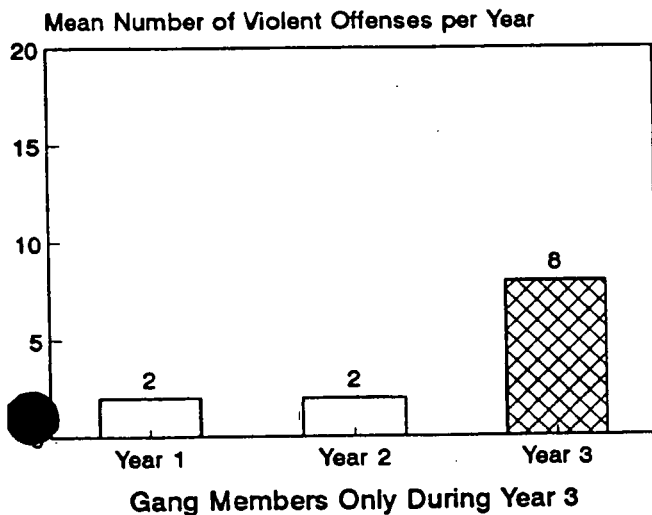
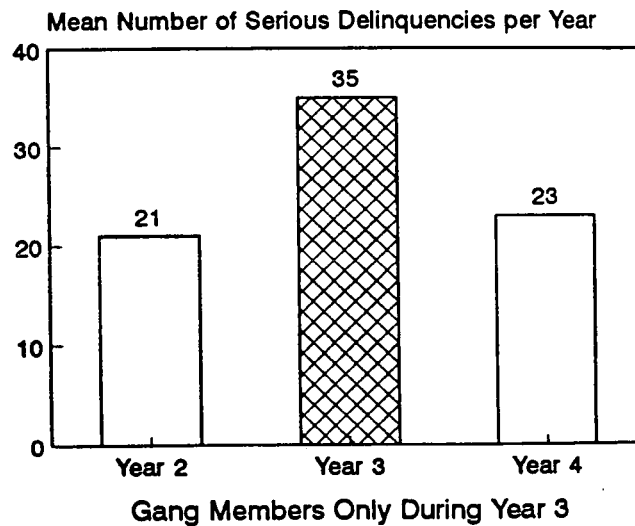
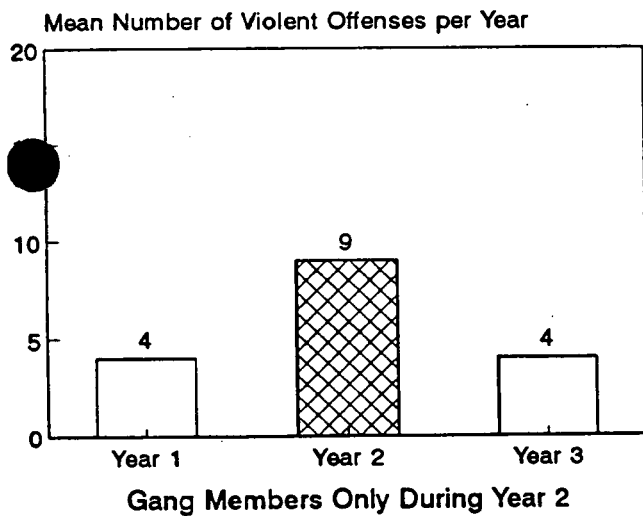
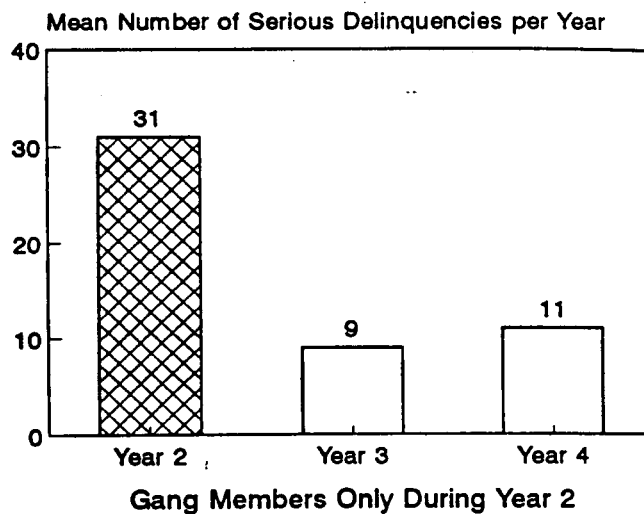
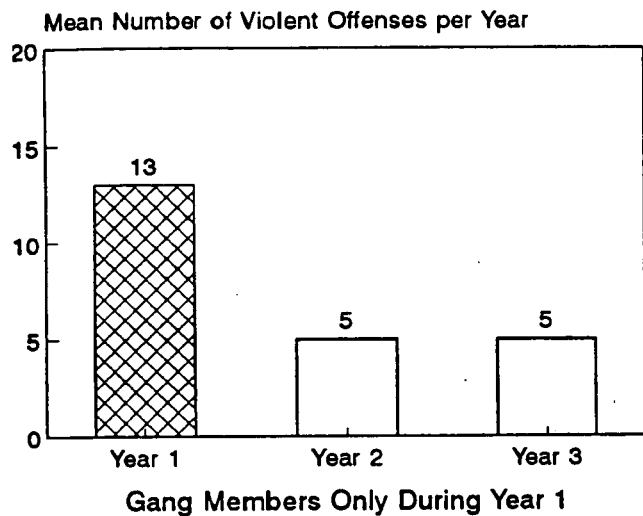
1. Selection Model: This model argues that gangs recruit their members from adolescents who are already highly delinquent. Regardless of their membership in the gang, these youth are likely to be delinquent.
2. Social Facilitation Model: This model implies that gang members are not particularly delinquent unless they are actively involved in the gang. In other words, the social processes of the gang facilitates or elicits the delinquency of its members.
3. Mixed Model: The third model is a combination of the other two. Gangs recruit their members from adolescents who are already delinquent but, while active members, their involvement in delinquency becomes even greater.

The individual-level, longitudinal data of the projects of the Program of Research on the Causes and Correlates of Delinquency are ideally suited for examining this issue. We have traced the delinquent careers of individual gang members before, during, and after their periods of active involvement in gangs. Because of that, we can see if gang members change their pattern of offending according to one of the three models just presented. Data from the Rochester and Denver studies are used to examine this issue.

In Rochester, we analyzed the violent delinquency of respondents who were gang members during only one of the first three years of the study. By doing so we can see if their offending changes as a function of their periods of active gang membership. The data are presented in Figure 9. To facilitate the reading of the graphs, the data for the year during which they are active gang members is highlighted.

The pattern of results is clearly consistent with a social facilitation model.

**Figure 9. Relationship Between Active Gang Membership and the Frequency of Violent and Serious Offenses**



(Rochester data)

(Denver data)

Delinquency is only substantially elevated during the year when the respondent was actively involved in a gang. Respondents who were gang members only during Year 1 report an average of 13 violent crimes during that year but, for these same respondents, that drops to an average of 5 per year after they leave the gang. For those who were gang members during Year 2 only, their violent crimes before membership is four, then doubles to nine during membership, and returns to four after they leave the gang. Finally, for respondents who were gang members only during Year 3, their violent offending prior to joining the gang is quite low -- an average of two per year -- but then increases to eight during the year they join the gang.<sup>3</sup>

Other data not shown here (see Thornberry et al., 1993) indicated that before and after periods of gang membership, gang members are not substantially different from non-gang members in terms of their violent offending. During the year of their active membership, however, the gang members reported substantially more violence than the non-gang members.

Overall, the pattern of these results is very consistent with the social facilitation model. In Rochester at least, gang members do not appear to be particularly different than non-gang members before or after the time period when they were in the gang. Gang members are not always prone to violence. When they are actively involved in the street gang, however, their rate of violent offending increases substantially. In other words, the social processes of the gang appear to facilitate or elicit their violent behavior.

In Denver, very similar yet different results were found. Using a general measure of street offending that combined violence, serious theft, and drug sales, the influence of gang membership on the frequency of involvement in these more serious types of delinquency can be clearly seen. Using data from the first four years of the survey and identifying youth actively involved in gangs in only one of these four years, much higher rates of delinquency involvement occur during years of active gang membership. This is pictured in Figure 9. As in Rochester, delinquency rates are substantially elevated during the year in which a respondent is actively involved in a gang.

In contrast to Rochester, however, the individuals who join gangs appear to be on a different delinquent trajectory than youth who do not join gangs. Individuals who became

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<sup>3</sup> Significance tests for these differences can be found in Thornberry et al., 1993, Table 5.

gang members were substantially more delinquent in the years preceding as well as during the year of gang membership. These findings are consistent with a mixed model. Gangs recruit members from adolescents who are already delinquent but, while active members, the delinquent involvement of these adolescents is substantially increased.

The findings from Rochester and Denver are consistent in pointing out the enhancement or social facilitation of delinquent behavior by gangs. Examination of other issues surrounding gang membership is continuing within the Program of Research.

## THE PREDICTION OF THE ONSET OF VIOLENCE AND VIOLENT ATTITUDES AND BEHAVIOR

Although there are several studies that predict violence, there are relatively few studies that predict the onset of violence. It is very important to study the latter, because without such qualification, one is unsure whether the prediction merely refers to the continuation of ongoing violence. For that purpose, we examined the onset of violence of the oldest sample (first studied at age 13) in the Pittsburgh Youth Study (Loeber & Zhang, 1995). Data from eight waves were used at half-yearly intervals and one yearly interval thereafter ( $n = 506$  at the inception of this study up to age 16).

The onset of self-reported violence was predicted with the onset after age 13 as the criterion. Violent behaviors were gang fighting, aggravated assault or murder, robbery, and rape. The following conclusions were drawn.

- o *Stability of violence.* We found that once a boy was involved in violence, he was over eight times more likely to recommit violent offenses across the next three assessment years, compared to boys who had not committed violence in the first place.
- o *Onset of violence.* By age 18, 50% of African American and 34% of Caucasian boys had at least one violent offense. The hazard rate for the African American boys was substantially higher than for the Caucasian boys between ages 12 and 16.
- o The best individual predictors of the time to the onset of violence after age 13 were anxiety and lack of guilt, and the best family predictors were inconsistent discipline and physical punishment. If time to onset of violence was not considered, individual predictors of a violence onset after age 13 were depressed mood, anxiety, hyperactivity/impulsivity/attention deficit, and lack of guilt. The family predictors were still inconsistent discipline and physical punishment.
- o One factor marginally predicted a delay in the onset of violence: being among the top 25 percent of boys who took the California Achievement Test in the first assessment year could reduce the chance of violence onset by a half (odds ratio = .51,  $p = .08$ ).
- o One of the intriguing findings is that risk factors for violence onset were age-specific. When comparisons were simultaneously made among different groups, i.e., those with a violence onset before age 13, those with a violent onset after age 13, and those who showed violence before *and* after age 13, family factors tended to be more salient for the before-age-13 group, individual factors were more prominent for the after-age-13 group, and both

individual and family factors were significant in the before-and-after-age-13 group.

- We found good agreement between cross-sectional and predictive factors that can best explain physical aggression and violence. Since many of these risk factors potentially can be changed, they are good candidates for future interventions.

### Violent Attitudes and Behavior

Violent attitudes and violent behavior are intertwined as two prominent indicators of antisocial development among youngsters. We define violent behavior as self-reported attempted or actual offenses as defined before. In addition, we defined violent attitudes as those attitudes which favor violent acts. Most of criminological research models specify violent attitudes as the causal factor and violent behavior as the outcome. Our study suggests that violent attitudes are at least an equally valid indicator, if not better, of juvenile deviancy as compared with actual violent conduct of a boy. The following conclusions were drawn.

- *Predictions between violent attitudes and behavior.* Among the boys aged 10-12, violent attitudes predicted violence better than violent behavior predicting violent attitudes.

In contrast, among the oldest boys (average ages of 13-16 years), violent attitudes predicted violent behavior as well as violent behavior predicting violent attitudes.

- *Stability of violent attitudes and behavior.* Stability of violent attitudes increased between the ages of 10 to 16, whereas stability of violent behavior remained more or less the same during this age period.

- Among the 10-12 year-old boys, the stability of their violent behavior was much higher than the stability of violent attitudes. However, by age 13-16, the stability of attitudes rose to a similar level as that of violent behavior, indicating boys of older ages tended to remain more stable in their attitudinal or behavioral patterns over time, either being violent or non-violent.

- *Correspondence between the changes in violent attitudes and behavior.* Boys' violent attitudes and behavior both steadily increased between the ages of 9-18 years. Violent attitudes accelerated at two turning points, that is, at ages of 11 and 15. Violent behavior accelerated at age 14, and continuously increased through age of 18 years. These turning points roughly coincide with the timing of school transitions in the Pittsburgh area.

- The results indicate that prevention and intervention on violence should include educational programs targeted at changing violent attitudes particularly in young populations of boys.

## RISK FACTORS FOR VIOLENCE

Many different variables have been proposed as causes of crime: having delinquent friends, having attitudes favorable to illegal behavior or too weakly supportive of conventional values, believing that it is not possible to succeed without breaking the laws or rules, not being sufficiently attached to or involved in conventional social institutions like the school and the family, conflict within the school or family, school failure, lack of access to educational or occupational opportunity, living in neighborhoods where drugs are readily accessible but jobs are not. It has also been suggested that differences in gender, ethnicity, and age may be associated with different degrees of exposure to different risk factors, with nonwhite adolescent males being most at risk.

Data from the Denver Youth Survey (DYS), are used to examine two related sets of risk factors for violent behavior, using multiple regression and path analysis to identify both direct and indirect effects. The first set of risk factors is derived from the integrated theory of Elliott et al. (1979). According to this theory, the most important influence on illegal behavior is delinquent peer group bonding. Other influences on illegal behavior, operate mostly indirectly, by influencing delinquent peer group bonding (or one of *its* causes), rather than by influencing illegal behavior itself. The indirect influences include weak beliefs that it is wrong to violate the law, low involvement in the family and school, normlessness (a sense of being unable to succeed if you follow the rules) in various social contexts, strain (lack of access to legitimate opportunity) in the contexts of school and work, and, even more indirectly, social and demographic characteristics including gender, ethnicity, and age. (Urban-suburban-rural differences were also considered in the theoretical model, but since DYS respondents live in an urban area that issue is not pursued here.)

The integrated theory has previously been tested on a national sample, the National Youth Survey, for general delinquency (a broad variety of more and less serious illegal behaviors from serious assaults to public disorder) and Index offending (aggravated assault, gang fighting, sexual assault, robbery, thefts of over \$50, burglaries, and motor vehicle theft) by Elliott et al. (1989) and specifically for violence by Roitberg and Menard (in press). The results of the previous tests generally confirm the predictions of the theory: only delinquent peer group bonding and gender were found to have direct effects on general and index offending, although belief, normlessness, involvement, and school strain had fairly important indirect effects. Roitberg and Menard (in press) found that respondents with high levels of

delinquent peer group bonding and male respondents were more likely to be involved in violent behavior (sexual assault, aggravated assault, and gang fighting), and that delinquent peer group bonding was also the one consistently strong direct influence on the *frequency* (number of occurrences) of violent behavior. In the present analysis, we replicate the analyses of Elliott et al. (1989) and Roitberg and Menard (in press), using data from the DYS. Not all of the measures used in the DYS are identical to those used in the NYS, but even when they are not identical, they are very similar.

The second set of risk factors is derived from the ongoing intervention efforts of J. David Hawkins and his associates, and additional measures from the Program of Research on the Causes and Correlates of Delinquency (PRCCD). Risk factors are divided into four groups: neighborhood, family, school, and individual/peer group risk factors. (Hawkins and Weiss, 1985; Hawkins, Catalano, and Miller, 1992). *Neighborhood* risk factors include availability of drugs and firearms, community laws and norms favorable toward drug use and firearms and crime, transitions and mobility, low neighborhood attachment, community disorganization, and extreme economic and social deprivation. *Family* risk factors include family history of high risk behavior, family management problems, family conflict, and parental attitudes and involvement. *School* risk factors include early and persistent antisocial behavior, academic failure, and lack of commitment to school. *Individual/peer* risk factors include alienation and rebelliousness, friends who engage in problem behavior, favorable attitudes toward problem behavior, and early initiation of problem behavior. At the individual level, conventional social bonding and "healthy" beliefs may act as protective factors, counteracting some of the risk factors.

The general perspective on which this list of risk factors is based is similar to the integrated theory of Elliott et al. (1979), and the set of risk factors identified includes most of the risk factors identified by Elliott et al. and extends that list considerably. For the present analysis, we limit our analysis of neighborhood risk factors to perceived characteristics of the neighborhood, as reported by DYS respondents' parents. The perceived characteristics of the neighborhood included here are unemployment and community norms favorable towards crime. This represents a small subset of the neighborhood influences and relies more on perceptions of the community by respondents than on objective data. More detailed analysis of the impact of neighborhood characteristics, involving hierarchical linear modeling techniques and neighborhood

characteristics not only as perceived by respondents or their parents, but also as indicated by census and ethnographic data, is presently in progress.

Family risk variables used in the analyses reported here included indicators of conflict between parents (as measured by the Conflict Tactics Scale), conflict between parents and their children, problems in discipline, and a variable indicating the *variety* of high risk behaviors (illegal behavior, drug use) committed by the parents and their children. School risk variables included academic failure, early and persistent antisocial behavior, and a scale measuring commitment to school. Individual/peer risk factors included indicators of normlessness and social isolation (two components of alienation), conventional values, beliefs that it is wrong to violate the law, guilt about law violation, the extent to which guilt about violating the law can be neutralized by excuses for an individual (techniques of neutralization), attachment to parents, involvement in family, delinquent peer group bonding, and early initiation of problem behavior. For each set of risk factors, the direct and indirect influences of the risk factors on violent behavior were analyzed using multiple regression and path analysis. The dependent variables were the *prevalence* (whether someone commits an offense) and *frequency* (how many offenses someone commits) of violent (aggravated assault, gang fighting, sexual assault, robbery, simple assault, throwing something at someone) and serious violent (the first four offenses listed above) offending. Each analysis was performed twice, once for variables measured at waves 1 and 2 (1988 to 1989), and once for variables measured at waves 4 and 5 (1991-1992) of the DYS. In these analyses, time order corresponds to causal order, with all causes either preceding or occurring at the same time as their effects. Testing each model twice allows us to see how consistent the results are, and whether there is reason to believe that the effects of the different risk factors vary systematically over time or age.

The results of the first analysis, using the risk factors of Elliott et al.'s integrated theory, are presented in Table 5. For both prevalence and frequency, delinquent peer group bonding has the most consistent (and with one exception, the strongest) influence on both general and serious violent offending. To the extent that age, ethnicity or gender have direct effects at all, those direct effects are weak. The results are mixed for the other variables, sometimes indicating direct effects but usually only indicating indirect effects. What is consistent is that the other variables appear to have some influence on illegal behavior, either direct or indirect. These results are what one would expect from a well-

Table 5

## Risk Factors from Elliott et al. (1989)

Direct influences on violent behavior	Primarily indirect influences on violent behavior	Variables that appear to have little or no influence on violent behavior
<u>Consistent</u> Delinquent peer group  <u>Mixed direct and indirect</u> Belief that it is wrong to break the law School strain Job strain	School normlessness Family normlessness Family involvement Age Ethnicity Gender	(none)

Table 6

## Risk Factors from Hawkins Prevention Model and the PRCCD

Direct influences on violent behavior	Primarily indirect influences on violent behavior	Variables that appear to have little or no influence on violent behavior
<u>Consistent</u> Delinquent peer group  <u>Mixed direct and indirect</u> School failure  Guilt about lawbreaking Techniques of neutralization Belief that it is wrong to break the law  Early antisocial behavior Early onset of problem behavior	Neighborhood lack of respect for the law Neighborhood unemployment  Problems in family management Parental attitudes Family involvement  Attachment or commitment to school	Family involvement in risky behavior Family conflict  Alienation/Isolation Normlessness Conventional values Attachment to parents

developed and previously tested theory, in the sense that all of the relationships are in the expected directions, none of the variables are irrelevant (all have at least some indirect influence), and the most important influence, as predicted by the theory, is delinquent peer group bonding.

The results of the second analysis, using risk factors from Hawkins' intervention model and the PRCCD, are presented in Table 6. As in Table 5, delinquent peer group bonding directly influences violent behavior. For prevalence of violent and serious violent behavior, delinquent peer group bonding consistently has the strongest direct influence, although for frequency the influence is not as consistent. Attitudes about illegal behavior, including guilt and techniques of neutralization, early onset of problem or antisocial behavior, and school failure have either direct or indirect influences on violent behavior. School failure, in particular, appears more relevant as a risk factor for older respondents. The influences of neighborhood, family, and school risk factors (other than school failure) appear to be indirect. Family involvement in risky behavior, family conflict, and alienation and bonding appear to have little effect on violent behavior, when all the other risk factors were taken into account.

These results must be qualified by noting that not all of the risk factors listed by Hawkins and the PRCCD have been examined here, and the measurement of others could be improved. Nonetheless, the results of the tests of the two sets of risk factors are reasonably consistent with each other and with the theories from which they were derived. Both tests point to delinquent peer group bonding as the most important risk factor for violent behavior, followed by personal attitudes toward the law and academic problems in school. Lack of access to job opportunities and early childhood antisocial and problem behavior also emerged as important risk factors. Other variables appear to influence violence indirectly, through their influence on patterns of peer group association, attitudes, and school performance.

## DEVELOPMENTAL PATHWAYS

Are there developmental steps toward violence? To answer this question, we investigated in the Pittsburgh Youth Study first the developmental ordering of problem behaviors, and then examined how many boys experienced problem behaviors in the hypothesized order. Our findings (Loeber, et al. 1993) show three developmental pathways (Figure 10):

(a) an **Overt Pathway**, consisting of a sequence starting with minor aggression (bullying and annoying others), followed by physical fighting (including gang fighting), and with violence (including robbery, rape, and aggravated assault) as a third step.

(b) a **Covert Pathway**, consisting of a sequence starting with minor covert behaviors (frequent lying, shoplifting), followed by property damage (firesetting, vandalism) and with moderate to serious forms of delinquency (burglary, car theft, fraud, drug dealing, etc.) as a third step.

(c) an **early Authority Conflict Pathway**, consisting in sequence before the age of 12 starting with stubborn behavior, followed by defiance, and with authority avoidance (truancy, staying late out late at night, and running away from home) as a third step.

These pathways summarize two basic ways that boys inflict harm on others, that is by physical harm and by property loss. The third pathway specifies precursors to status offenses (truancy, running away).

Not all boys will advance through each step of a pathway; in fact, boys differ in the degree to which they penetrate the pathway, with some advancing one step, others two steps, and another group advancing through the full pathway. However, boys who display behaviors characteristic of the last step in a pathway are likely to have displayed behaviors earlier in life characteristic of lower steps in a pathway. Thus, in males' development of violence, we found that most boys who eventually engaged in violence had first engaged in minor aggression and in physical fighting, in that order.

A proportion of boys, in the process of normal growing up, may show problem behavior for a short period only (here called experimenters). For that reason, in subsequent analyses (Loeber, Keenan, Sieck & Zhang, 1995), we concentrated on distinction between experimenters and persisters (i.e., those whose problem behavior persisted for more six months). Making this distinction had much utility, because especially the persisters followed the hypothesized order in the pathways. For example, persisters who physically fought were

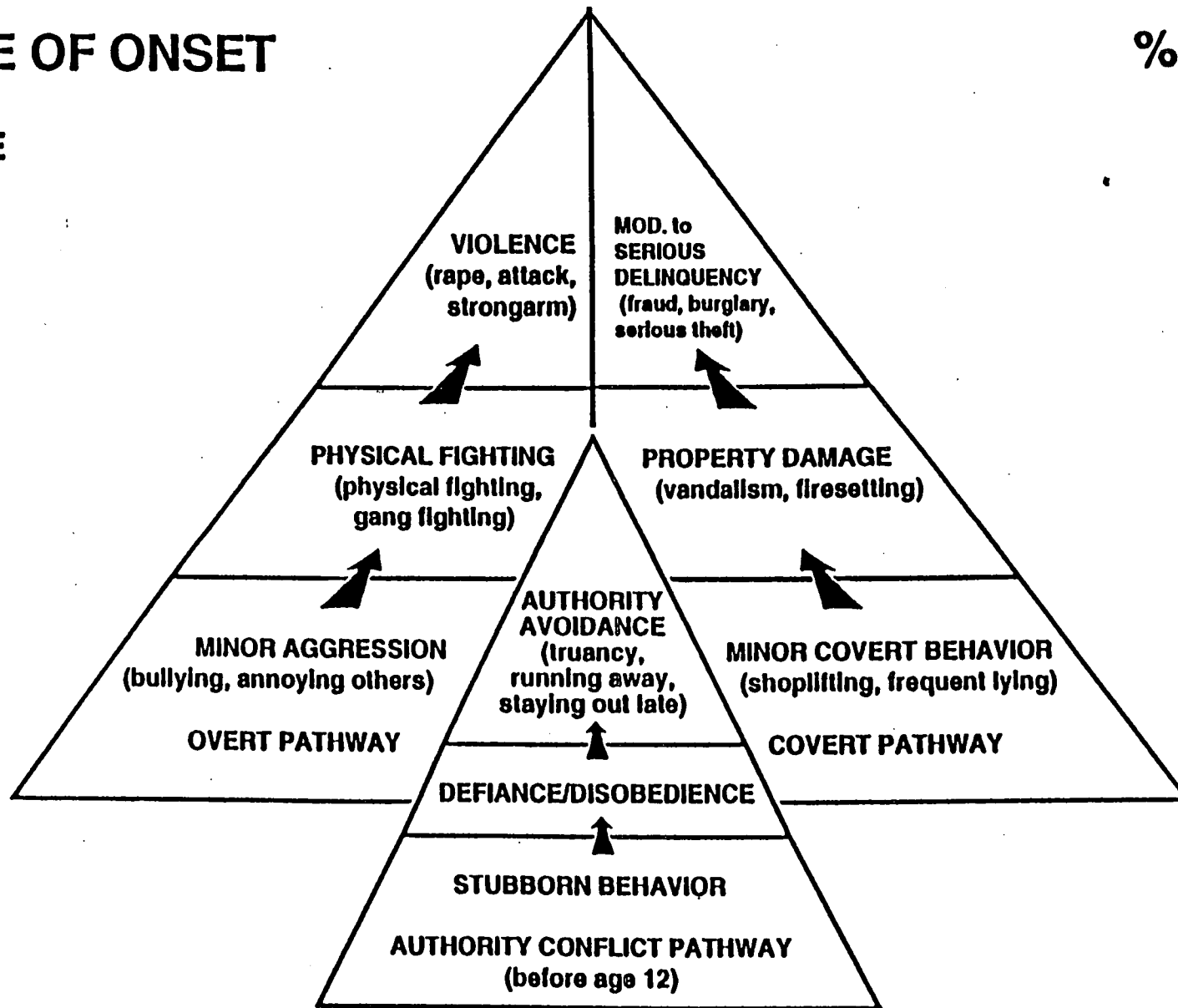
Figure 10

AGE OF ONSET

% BOYS

LATE

FEW



**THREE PATHWAYS TO BOYS' PROBLEM BEHAVIOR AND DELINQUENCY**

EARLY

MANY

more likely than experimenters to have first engaged in minor aggression compared to the few boys who skipped minor aggression and developed physical fighting. Moreover, the developmental ordering of aggressive behaviors of increasing severity in the Overt Pathway, were independent of ethnicity. Also, the results were replicated across two samples (i.e., the middle sample first studied at grade 4 (average age 10), and the oldest sample first studied at grade 7 (average age 13).

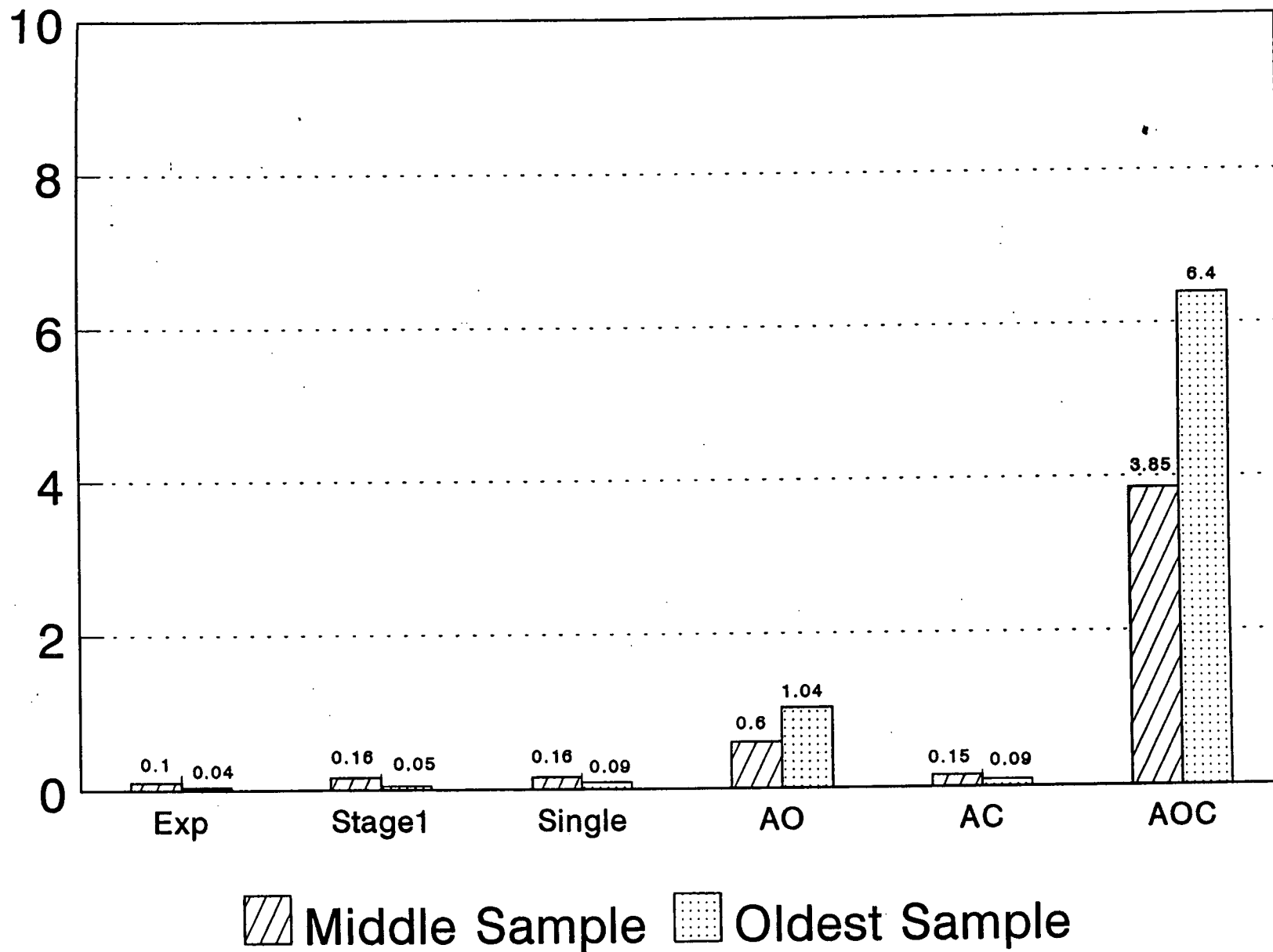
Pathways can be best thought of as lines of development, with some boys following several lines of development. Thus, boys can be in more than one pathway. The study of boys development on multiple pathways sheds light on the emergence over time of a group of high rate chronic offenders. To address this, we first asked what percentage of the boys with problem behaviors persisted in the Overt Pathway and in one or more of the other pathways? In the two samples, very few were in the dual Overt and Covert Pathway (1-2%), 9% were in the dual Overt Pathway and Authority Conflict Pathway. The proportion who were in the triple pathways (Overt, Covert and Authority Conflict) increased with age, with 12% in the middle sample, and one-and-a-half as many (18%) in the oldest sample. Thus, there was a trend for the proportion of boys with generalized forms of offending (i.e., those in triple pathways) to increase during adolescence.

The risk for aggressive and nonaggressive boys to enter other pathways was not the same. Specifically, boys in the Overt Pathway were much more likely to enter the Covert Pathway than boys in the Covert Pathway to enter into the Overt Pathway. Thus, aggressive boys were most at risk to become generalized offenders.

This development for some boys to diversify offending is also reflected in the rate of offending. Boys in the triple pathways, compared to boys in single or in dual pathways, had the highest rate of self-reported violent offenses (Figure 11), which was replicated in the two samples. Results for court petitions of violent offenses showed a similar trend (not shown here).

To what extent does the classification according to pathways account for most of the high rate violent offenders? The results indicate that almost 80% of the high rate violent offenders were among the persisters who had advanced in steps 2 or 3 in one or more of the pathways (another 10% persisted in step 1). This means that almost all of the high rate violent offenders were accounted for in the pathway model.

**Figure 11. Self-Reported Violent Offenses**



Exp = experimenters; Stage1=boys reaching stage 1 only; Single=any single pathway; A=Authority; O=Overt; C=Covert

**Conclusions** The results indicated that:

- For most boys the development of delinquency takes place in an orderly fashion and can be characterized by three pathways: an Overt Pathway, a Covert Pathway, and an Authority Conflict Pathway.
- The Overt Pathway consists of a sequence starting with minor aggression (bullying and annoying others), followed by physical fighting (including gang fighting), and eventually violence (including robbery, rape, and aggravated assault).
- Boys differ in the degree to which they penetrate the Overt Pathway.
- Most boys who committed violence, first developed minor aggression, and then physical fighting before starting violent acts.
- This orderly development is most lawful for boys whose problem behavior persisted for at least six months.
- Most boys who advanced in the Overt Pathway first advanced in the Authority Conflict Pathway.
- Boys in the Overt Pathway were more at risk to enter the Covert Pathway than boys in the Covert Pathway entering the Overt Pathway.
- Almost all of the high rate violent offenders were accounted for in the pathway model.

## EXPLANATORY FACTORS OF PHYSICAL FIGHTING

Our discussion of pathways indicated the importance of boys' physical fighting as a precursor to violence. Because of the pivotal role that physical fighting plays in this development, in Pittsburgh we examined more closely which factors could best explain why some boys were physical fighters and others not (Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1995). The measure of physical aggression used here summarizes the boys' life-time physical aggression (based on two assessments), using information from the parent and teacher (not the child, to avoid overestimation). The analyses are limited here to explanatory factors measured in the first follow-up of our study. We used odds ratios to express the strength of the relationships between explanatory factors and physical fighting (Table 7). The analyses were done for the youngest, middle, and oldest samples (first studied at grade 1 (average age 7), grade 4 (average age 10), and grade 7 (average age 13), respectively.

### Conclusion

- o The following child variables were the strongest in explaining boys' physical aggression: lack of guilt feelings, a high score on hyperactivity/impulsivity/attention problems, low academic achievement, anxiety, and shy/withdrawn behavior.
- o Child rearing practices, especially poor supervision, poor communication, and physical punishment were related to physical aggression; the relation with physical punishment increased in strength with age. Parental stress was also consistently related to physical fighting, as was the boy not having two biological parents in the home.
- o Living in a bad neighborhood was associated with boys' physical fighting in two of the three samples.
- o All of the preceding factors applied to physical fighting in the youngest boys (aged 7-8). In addition, these young boys tended not to be involved with their family, have parents with one or more of the following problems: anxiety/depression, substance use problems, fathers who engaged in problem behavior when they were young. Also, these families of boys who physically fought tended to be of a low socio-economic status, were on welfare, and large in size.
- o There are probably several conditions that independently foster physical fighting in boys. For example, we found that low SES was associated with physical aggression only if the boy did not have a high Attention-Deficit Hyperactivity-score (ADHD score), was

**Table 7: Explanatory Variables for Physical Aggression (odds ratios)**

<b>Child</b>	<u>Youngest</u>	<u>Sample Middle</u>	<u>Oldest</u>
Old for grade (P)	2.4***	1.5*	1.7**
Lack of guilt (PT)	6.5****	5.0****	5.9****
HIA problems (PT)	5.2****	4.2****	6.1****
High ADHD-score (DISC)	4.3****	3.9****	4.1****
Low achievement (PBT)	1.9**	2.0***	2.0**
Low achievement (CAT)	2.0**	1.6*	2.0**
Depressed mood (B)	1.5	1.6*	-1.1
Anxiety (PT)	2.0**	1.5*	1.6*
Shy/withdrawn (PT)	2.5****	2.4****	1.8**
<b>Family</b>			
Poor supervision (PB)	2.2***	1.5*	1.7*
Poor communication (PB)	—	2.5****	2.8****
Low reinforcement (PB)	1.2	1.6*	2.0**
Physical punishment (PB)	1.9**	2.0***	4.6****
Boy not involved (PB)	1.5*	1.2	1.2
Disagree on discipline (PB)	—	1.7*	-2.0
Unhappy parents (P)	2.8**	1.8*	1.8
Boy not close to mother (B)	—	1.0	1.6*
Parental stress (P)	1.8**	2.6****	1.9**
Parent substance use problems (P)	2.0**	1.4	1.4
Parent anxiety/ depression (P)	2.1**	1.8**	1.3
Father behavior problems (P)	1.8*	1.8*	1.6
<b>Macro</b>			
<b>Socio-economic</b>			
Low SES (P)	1.9**	1.7**	1.5
Family on welfare (P)	1.5*	1.2	2.1****
Poor housing (P)	1.1	1.1	2.0**
Unemployed mother (P)	1.1	1.0	1.6*

### Demographic

African-American (P)	1.2	1.2	1.5*
Large family (P)	1.6*	1.4	-1.2
Non-biological parent (P)	2.0**	1.7**	2.2**

### Neighborhood

Bad neighborhood (P)	1.9**	1.2	2.2***
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Note: \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; \*\*\*\*  $p < .0001$ . No significant relationship: few friends, low organizational participation, low jobs/chores involvement, low religiosity, no set time home, small house, unemployed father, parent antisocial attitude, poorly-educated mother, young mother, bad neighborhood (C), and parent antisocial attitude.

associated with physical aggression especially in the absence of low SES. In other words, a high ADHD-score and low SES may be alternative routes to physical aggression.

- o Physical fighting could be best explained by a combination of child factors and parent factors, especially parent's child rearing practices.
- o Physical fighting was already more in evidence in young boys living in families with parents showing mental health or substance use problems.

## RESILIENT YOUTH

The research of the Program of Research on the Causes and Correlates of Delinquency has identified many risk factors associated with delinquency and violence. They include individual, family, school, peer, and neighborhood factors. Moreover, our research, as well as that of many others, has shown that youth experiencing multiple risk factors are much more likely to be delinquent than youth experiencing none or only a few risk factors (see, for example, the discussion of risk factors in Huizinga et al., 1994 and Smith et al., forthcoming).

Although research has clearly identified a number of important risk factors for delinquency, not all high-risk youth succumb to the risk and actually engage in delinquency or violence. Some high-risk youth are resilient and manage to avoid these negative outcomes. Presumably, there are buffering or protective factors in their environment that counteract the negative influences of the risk factors. If so, identifying protective factors is important for policy and practice since they suggest fruitful areas for potential intervention.

The Rochester project examined this topic by identifying high-risk youth and then studying the protective factors that were associated with resilience for them. High-risk youth were defined as those who had five or more of the following family-based risk factors: low parental education, parental unemployment, family receipt of welfare, the respondent's mother having her first child before the age of 18, the respondent's family moving five or more times before he or she was age 12, family members experiencing trouble with drugs, family members experiencing trouble with the law, an official record of child abuse or maltreatment, and the respondent being placed in care outside the family. The prevalence of serious delinquency for youth experiencing five or more of these factors was three times as high as the rate for those who experienced none of these risk factors (36% vs. 11%). Despite the presence of these risk factors most of the high-risk youth were resilient, that is, most of them did not engage in serious delinquency. Can we identify protective factors that helped them avoid delinquency?

Our analysis identified twelve school, family, and peer protective factors that were significantly related to resilience for these high-risk youth. All of the protective factors were measured when the subjects were either eighth or ninth graders. Youth who are committed to school, who do well in school, and who intend to continue their education all have high

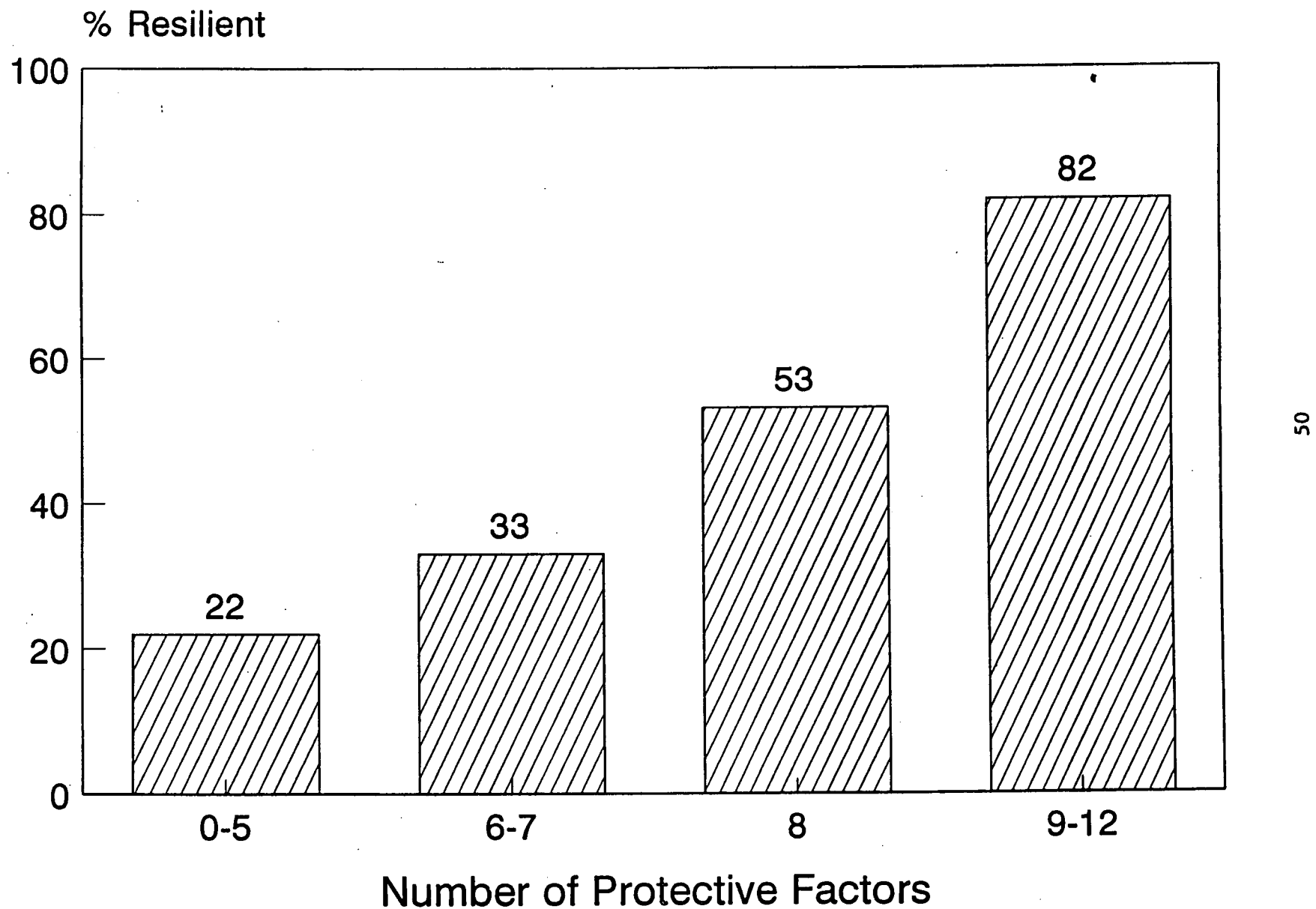
levels of resilience. Similarly, youth who experience high levels of parental supervision and attachment have high levels of resilience. Finally, youth who associate with conventional peers and peers who are approved of by their parents have high rates of resilience. While statistically significant, each of these protective factors taken separately had a relatively small impact on resilience.

Taken together, however, these protective factors have a very strong impact on resilience, at least during grades 8 and 9 (Figure 12). Of the high-risk youth who had between zero and five of these 12 protective factors, only 22 percent were resilient. In other words, 78 percent succumbed to the risk and engaged in serious delinquency at grades 8 or 9. As the number of protective factors increases, however, so too does the level of resilience. Eighty-two percent of the youngsters who have nine or more of these protective factors in their environment are resilient. In other words, only 18 percent of them engage in serious delinquency! That is a remarkable statistic, especially when it is recalled that we are only dealing with high-risk subjects here -- subjects who have five or more of the family-based risk factors listed earlier. Even for these high-risk youngsters, 82 percent of them can avoid serious delinquency if multiple buffering or protective factors are present.

While these results are encouraging, this effect is not very long lasting. The data presented in Figure 13 address the impact of these same protective factors on serious delinquency measured over the next two years, when the younger Rochester cohort was in grades 9 and 10 and the older one was in grades 10 and 11. Here we do not see any significant impact of protective factors measured at grades 8 and 9 on resilience. High-risk youth with many protective factors are not significantly more likely to be resilient and avoid delinquency than are youth with fewer resilient factors. This same result is also observed at grades 11 and 12.

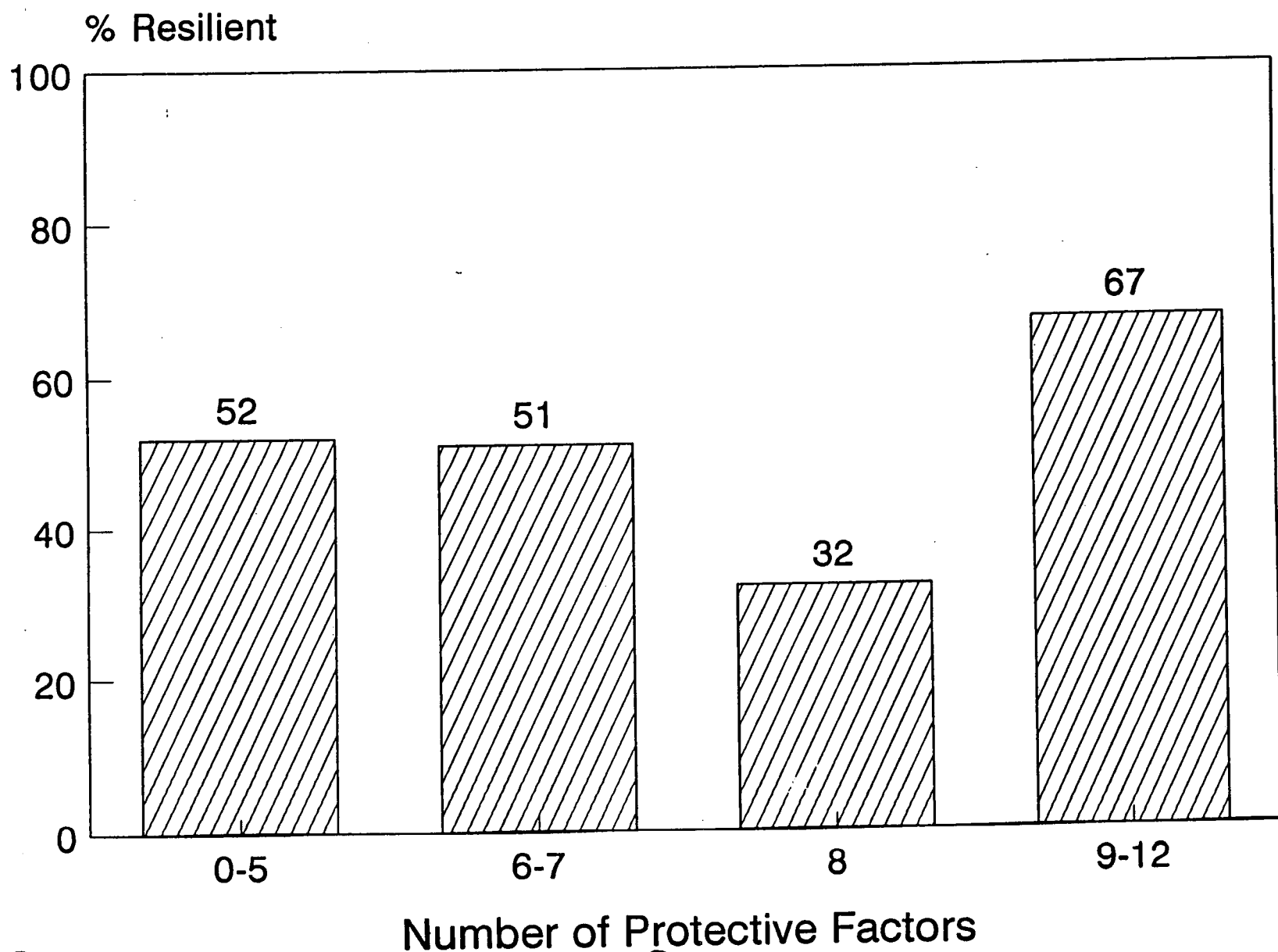
In sum, the results from this analysis of protective factors are somewhat mixed. On the one hand, there appears to be a rather sizeable contemporaneous impact of protective factors on resilience for high-risk youth. When multiple protective factors are in place, even high-risk youth can successfully avoid involvement in serious delinquency. Only 18 percent of the high-risk youth buffered by multiple protective factors were delinquent. On the other hand, this impact is not very long-lasting. While protective factors reduce delinquency when they are in place, they do not appear to be capable of reducing delinquency even two or three years into the future.

**Figure 12. Relationship between Protective Factors at Grades 8 and 9 and Resilience at Grades 8 and 9 (High Risk Youth Only)**



(Rochester data)

**Figure 13. Relationship between Protective Factors at Grades 8 and 9 and Resilience at Grades 9 to 11 (High Risk Youth Only)**



## **CHILD MALTREATMENT AND ADOLESCENT PROBLEM BEHAVIOR**

Family violence has become an area of serious public concern. Child maltreatment affects almost one million children a year nationwide, and the rates of reported maltreatment are increasing. Moreover, we know from past research that the consequences of childhood maltreatment extend into adolescence and beyond, and include a variety of negative outcomes such as delinquency, alcohol and drug abuse, emotional and mental health problems, school failure and teen pregnancy. Few studies, however, have been able to look at outcomes in several different domains of problem adolescent behavior at the same time. This is unfortunate because adolescents who have problems in more than one life area are a particular challenge for policy and intervention efforts. Identifying risk factors for multiple problem youth is therefore an important issue.

In this analysis we use data from the Rochester study (RYDS) to look at whether there are multiple problem outcomes for adolescents who have been maltreated as children. We address two issues. First, what is the range and extent of problems found among adolescents who have been maltreated as children, compared to those who were not maltreated? Second, to what extent is child maltreatment a risk factor for the development of multiple problems?

### **Measurement**

**Adolescent Problems.** A large number of problem behaviors, covering different behavioral areas, have been measured in the Rochester study. For this analysis we select one indicator from each of the following domains -- delinquency, drug use, teen pregnancy, school failure, and mental health problems. The specific indicators are as follows:

Serious delinquency is an 8-item index of serious self-reported delinquency like breaking and entering, serious theft, and serious assault. Scores on delinquency items are summed across waves 2 through 8 of the youth interviews. Drug use is measured by the prevalence of the use of any illegal drug from waves 2 through 8. The measure of pregnancy comes from an item on each youth interview from waves 5 through 9 which asks if female subjects experienced a pregnancy or if male subjects caused a pregnancy. Grades, provided by Rochester City School District, are used to compute GPA, and a GPA of less than 2.0 (less than a "C") is categorized as Low GPA. Adolescent mental health problems are measured

via parent assessment of their children on a list of emotional and behavioral symptoms and syndromes. We use a shortened version of the Achenbach Child Behavior Checklist (Lizotte et al., 1992) which has 46 items divided into seven scales and two broad syndromes, called Externalizing and Internalizing. Adolescents who score in the top 10 percent on either the Externalizing or Internalizing syndrome are counted as having problems suggestive of psychopathology and/or behavioral disturbance.

**Maltreatment.** Child maltreatment data come from Child Protective Service case records of the Department of Social Services in Monroe County (Rochester). Only substantial incidents which occurred before subjects were age 12 are counted in this particular analysis since we wanted to include only maltreatment which had occurred before our outcome measures. In this sample, 13.6 percent teens have a maltreatment record, and 86.4 percent were not maltreated.

### **Findings**

#### **Child Maltreatment and Delinquency**

Several studies have looked at the higher risk of delinquency among youth who have a maltreatment history, and our study confirms that youth who are maltreated are more likely than those who were not maltreated to be delinquent and to commit serious delinquent acts. The first line in Table 8 shows that 42 percent of the adolescents who were maltreated as children have committed at least one serious delinquent act, compared to 32 percent of the adolescents who were not maltreated. This difference is significant and represents an increase in risk of about one-third. We also find significant differences between the maltreated and non-maltreated groups in the occurrence and amount of violent behavior (Table 8, line 2) and other types of self-reported and official delinquency (see data in Smith and Thornberry, 1994).

#### **Maltreatment and Drug Use**

Drug use is another problem behavior with significant consequences in terms of personal and social disruption. Table 8 shows that 43 percent of the RYDS adolescents who were maltreated as children have used drugs, compared to 32 percent of those who were not maltreated. The risk of using drugs is therefore about one-third higher among youth who have a maltreatment history.

**Table 8: Relationship Between Prevalence of Child Maltreatment and Various Negative Outcomes During Adolescence**

	<u>Maltreated</u>	<u>Non-Maltreated</u>	<u>n</u>
<i>Prevalence of:</i>			
Serious Delinquency	42%	32%*	899
Violence	70%	56%*	877
Drug Use	43%	32%*	877
Pregnancy (Females only)	52%	34%*	253
Low GPA	33%	23%*	928
Mental Health Problems	26%	15%*	929

Chi-square one-tailed tests: \*p < .05

### **Maltreatment and Teen Pregnancy**

Policymakers, researchers and practitioners are concerned about increases in teen pregnancy rates, and the serious impact of teen pregnancy on the life course of teen mothers and their babies. For a variety of reasons males and females were separated in this analysis. Although maltreated boys do not report higher rates of impregnating girls than non-maltreated boys, as Table 8 shows, rates of teen pregnancy are significantly higher among maltreated girls, with 52 percent of the maltreated group experiencing a pregnancy, in comparison to 34 percent of the non-maltreated group.

### **Maltreatment and School Problems**

Literature on the immediate childhood consequences of maltreatment often emphasizes problems in concentrating and achieving well in school. Line 5 of Table 8 shows that by the time maltreated children are in high school, their school achievement is significantly lower than that of youth who do not have a history of maltreatment. Poor grades are evident among 33 percent of the maltreated group, compared to 23 percent in the group who were not maltreated. Poor grades are in turn likely to be linked with premature school dropout, and with reduced opportunity.

### **Maltreatment and Mental Health Problems**

Mental health problems which affect teenagers include conduct problems, such as aggressive, hostile and hyperactive behavior, and problems which are more internal to the teenager, such as depression, withdrawal and physical distress. One might expect such symptoms to be linked with prior maltreatment, as indeed Table 8 suggests. Looking at those whose parents report the highest number of either Internalizing or Externalizing problems, 26 percent of maltreated teenagers are in this group, compared to 15 percent of non-maltreated teens. These teenagers would be at high risk for diagnosable mental health problems.

### **Multiple Problem Behavior**

Some teenagers have multiple and overlapping problems which increase the likelihood that they will not be able to make a successful transition to adult roles and responsibilities. In this analysis, we look at whether childhood maltreatment is a risk factor for having multiple problems during adolescence. Table 9 compares the proportion of maltreated versus non-maltreated youth with different numbers of the negative outcomes discussed above. Looking at the top row of Table 9, we see that a lower proportion of maltreated youth have no negative outcomes compared to the non-maltreated group: 28 percent of the maltreated group have no problem behaviors, compared to 40 percent of non-maltreated youth. Non-maltreated youth are more likely to come through adolescence unscathed by serious problems. Maltreated youth and non-maltreated youth are almost equally likely to have only one or two problems; 40 percent of the maltreated group and 42 percent of the non-maltreated youth have one or two negative outcomes. This suggests that many youngsters, not just those who had been maltreated, have a problem in some area of their lives, and a number of risk factors are involved. However, when we look at the group of most concern, youth experiencing three or more of the five problem areas examined here, we see that maltreatment is a significant risk factor for multiple problem outcomes. Of the maltreated youth, 32 percent have three or more negative outcomes, compared to only 18 percent in the non-maltreated group. Maltreatment almost doubles the risk of having multiple negative outcomes.

### **Maltreatment and Later Violence**

Of particular concern to policymakers is the link between maltreatment and later youth violence, given the high rates of youth violence in America today. Table 10 indicates a significant relationship between these variables. Sixty-nine percent of the youths who had been maltreated as children reported involvement in violence as compared to 56 percent of those who had not been maltreated. In other words, a history of maltreatment increases the chances of youth violence by 24 percent.

**Table 9: Relationship Between Prevalence of Maltreatment and Number of Negative Outcomes During Adolescence**

	<u>Maltreated</u>	<u>Non-Maltreated</u>
<i>Number of Negative Outcomes:</i>		
0	28%	40%
1-2	40%	42%
3 or more	32%	18%

Chi-square = 17.1; df = 2; p < .001

**Table 10. Relationship between Prevalence of Child Maltreatment and Involvement in Youth Violence**

	<u>Maltreated</u>	<u>Non-Maltreated</u>
Youth Violence		
Yes	69.6%	56.0%
No	30.4%	44.0%

### **Summary and Conclusions**

Being maltreated as a child increases the risk of a variety of negative consequences during adolescence. Maltreatment is a risk factor for serious delinquency, drug use, poor school performance, mental health problems and, for girls, teen pregnancy when these problems are considered separately. Maltreatment is associated with an increase in risk of at least one-third for each of these outcomes. Any one of these problems is in turn potentially associated with serious and long term problems in the transition to adulthood. Maltreatment diminishes the likelihood that children will come through adolescence with no serious problems. Moreover, a history of childhood maltreatment increases the risk that teenagers will experience multiple problems during the adolescent life-stage. This is a particularly significant finding, in that we know little about factors which increase the risk that youth will develop several adverse outcomes. Interventions for these youth are particularly complex and costly, yet failure to assess and intervene in the pathways connecting maltreatment experiences to multiple problems can have far-reaching consequences. Maltreatment is also a risk factor for later involvement in youth violence, the particular focus of this report.

## **ADOLESCENT FIREARMS OWNERSHIP, ACQUISITION AND USE**

### **Adolescents and Guns**

America is experiencing an epidemic of gun violence among youth. For example, the homicide rate for those between 15 and 19 years of age increased by 154 percent from 1985 to 1991, and 97 percent of this increase is gun related (Blumstein, Forthcoming). This trend shows no sign of slowing. In fact, the teenage homicide rate using firearms has been rising at an increasing rate over the past six years. The problem is particularly acute for the nation's minority youth. Clearly there is either an increase in teenage gun possession or an increasing willingness on the part of teenagers to use guns, or both.

While researchers have typically focused on patterns of legal and illegal firearms ownership for adults, only recently have they considered adolescents and guns. If adolescent gun ownership and use reflects that of adults, we might expect there to be both legitimate and illegitimate adolescent gun owners. The former group are not likely to be involved in criminal activity with their guns while the latter should. If these two types of adolescent owners are prevalent then finding the mechanism for socialization into each group could have important policy implications. In this analysis we will (1) identify youths who own guns for both legitimate and illegitimate reasons; (2) identify how each type of ownership relates to criminal activity; and (3) locate the socialization mechanisms into each type of ownership. The data reported here are taken from wave 4 interviews from the Rochester study when the subjects were 14 and 15 years of age. The analysis is limited to boys because at these ages girls rarely own guns.

### **Adolescent Firearms Ownership**

It would be most desirable to measure legal and illegal ownership of guns by the subjects. However, in New York State virtually all purchase of guns is illegal at these ages. Because of this, subjects were asked if they owned a gun, the type of gun owned (handgun, rifle or shotgun), and the reason for ownership (sport use or protection). Sport owners were categorized as those who reported owning only for sport reasons. Conversely, protection owners are those who report owning for protection whether or not they own for sport use.

At these ages, gun ownership for protection is probably related to "risks stemming from a life of crime." (Wright and Ross, 1986). If this is true, one would expect protection

owners to be more likely to own handguns, and sawed off rifles and shotguns. In addition, they should be likely to be involved in crime. On the other hand, sport owners should be more likely to own unadulterated rifles and shotguns and less likely to be involved in crime.

Ten percent of the sample of boys report owning any type of gun. Four percent own for sport and 5.9 percent own for protection. The 27 sport owners report owning a total of 30 guns: 21 rifles and shotguns (one sawed off) and 9 handguns. The 30 protection owners are quite different. They own a total of 62 guns: 29 rifles and shotguns (16 sawed off) and 33 handguns. In other words one-third of the sport guns ( $n = 10$ ) are concealable (the sawed off long gun and the hand guns) while nearly 80 percent of protection guns are concealable ( $n = 49$ ). Clearly, adolescents who own guns for protection have different types of guns than those who own for sport.

### **Guns and Crime**

Figure 14 shows the percentage of adolescent boys who carry guns on the street and who have committed gun crimes by type of ownership (no gun ownership, sport gun ownership, or protection gun ownership). Seventy percent of those who own protection guns report carrying a gun on the street. In contrast, only 3.2 percent of those with no gun and 11.1 percent of those with a sport gun report having done so. Similarly, 30 percent of those who own a protection gun have committed a gun crime compared to only 1.3 percent of non owners and 3.7 percent of sport owners. Those who own protection guns are far more likely to use those guns in a criminal way. Sport gun owners, however, look more like non gun owners than protection owners in terms of gun crime.

Figures 15 and 16 show that protection gun owners are very likely to be gang members and to sell drugs while non gun owners and sport gun owners are not. More than 67 percent of protection gun owners are gang members. However, only about 7 percent of non gun owners and 11 percent of sport gun owners are in gangs. Similarly, more than 32 percent of those who own guns for protection sell drugs. Those who do not own guns and those who own guns for sport are unlikely to sell drugs (3.5% and 7.4% respectively).

### **Socialization Into Gun Use**

Different forces lead adolescents to own guns for sport and for protection. Figure 17 shows the percent of parents owning guns for each type of adolescent ownership. Sport gun

**Figure 14. Percent of Respondents Carrying Guns and Committing Gun Crimes by Type of Gun Owned**

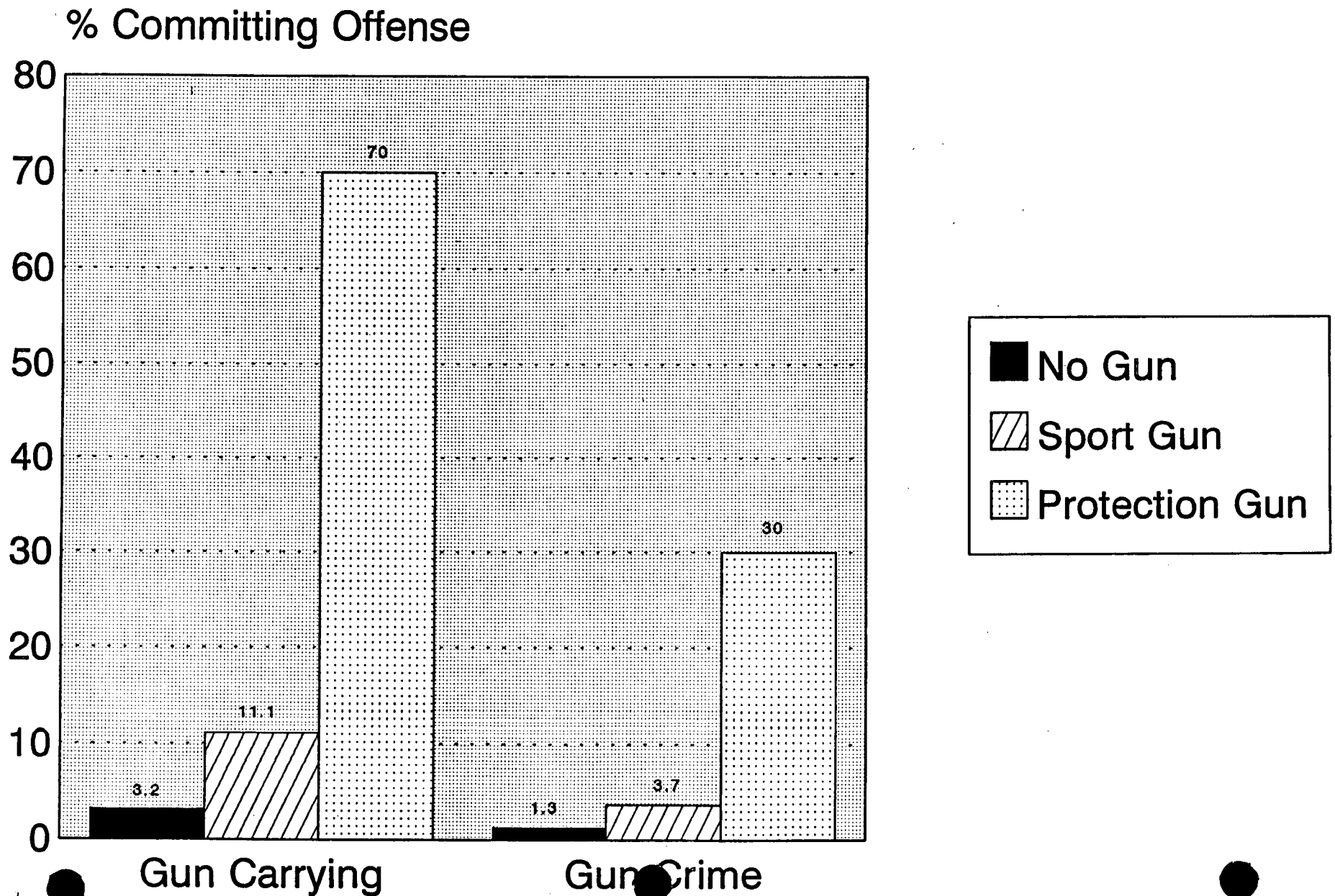
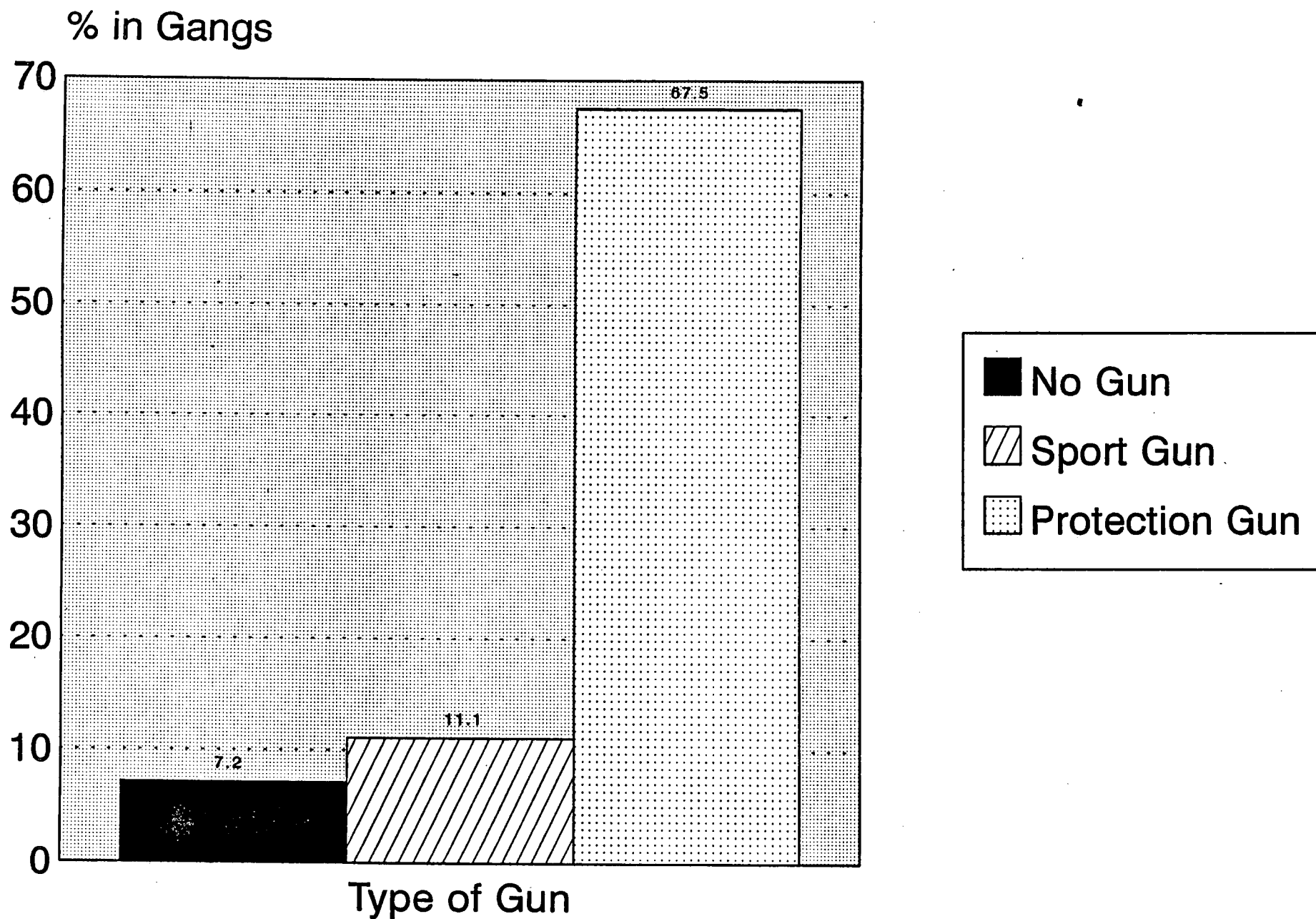
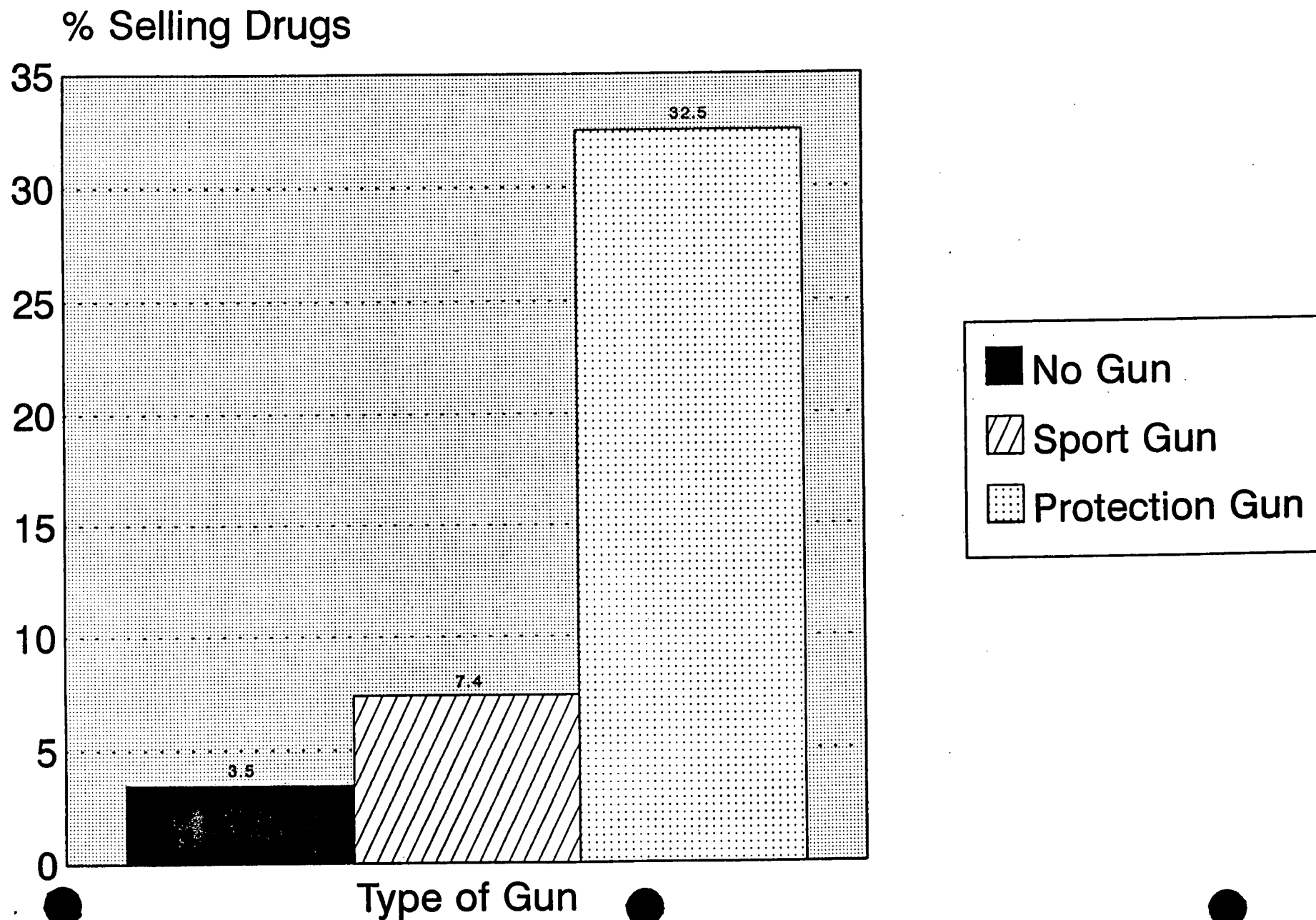


Figure 15. Percent of Respondents in Gangs by Type of Gun Owned



**Figure 16. Percent of Respondents Selling Drugs by Type of Gun Owned**



owners are much more likely to have parents who also own for sport (37%). However, those who do not own guns and protection owners are not nearly as likely to have parents who own guns (12.1% and 15% respectively). This suggests that adolescents who own guns for sport obtain the motivation from their parents. Non gun owners and protection owners do not.

On the other hand, Figure 18 shows that adolescents who own guns for protection are very likely to have peers who also own guns for protection (85%). Conversely, adolescents who do not own a gun or who own for sporting reasons are much less likely to have peers who own guns for protection (29.3% and 25.9% respectively). Apparently, protection gun owners obtain the motivation from their peers.

### Summary

Adolescent gun owners can be divided into two groups: those who own guns for sport and those who own for protection. Teenagers who own guns for sport tend to own unadulterated rifles and shotguns. Teenagers who own for protection are most likely to have handguns and sawed off rifles and shotguns; their guns are much more concealable and deadly. At these ages -- 14 and 15 -- more teenagers in Rochester own guns for protection than for sport. Furthermore, when extrapolated to the general adolescent population, these results indicate that there is a sizeable number of protection owners at these ages. Gun ownership, and in particular protection gun ownership is not a rare event. Those who own guns for protection are very likely to carry guns on the street, to commit gun crimes, to be gang members, and to sell drugs. Adolescents who own guns for sport look more like those who do not own guns than protection gun owners. Finally, teenagers who own guns for sport receive the motivation for ownership from their parents who also own guns for sport. Because of this socialization process they pose little threat to society. The socialization process for adolescents who own guns for protection is much more sinister. They receive the motivation for ownership from their peers who are also likely to own for protection. It is clear that in order to deal with the adolescent gun problem in the nation we must focus on the linkage between adolescents and their peers who own guns for protection.

**Figure 17. Percent of Parents Owning Guns by Type of Gun Owned**

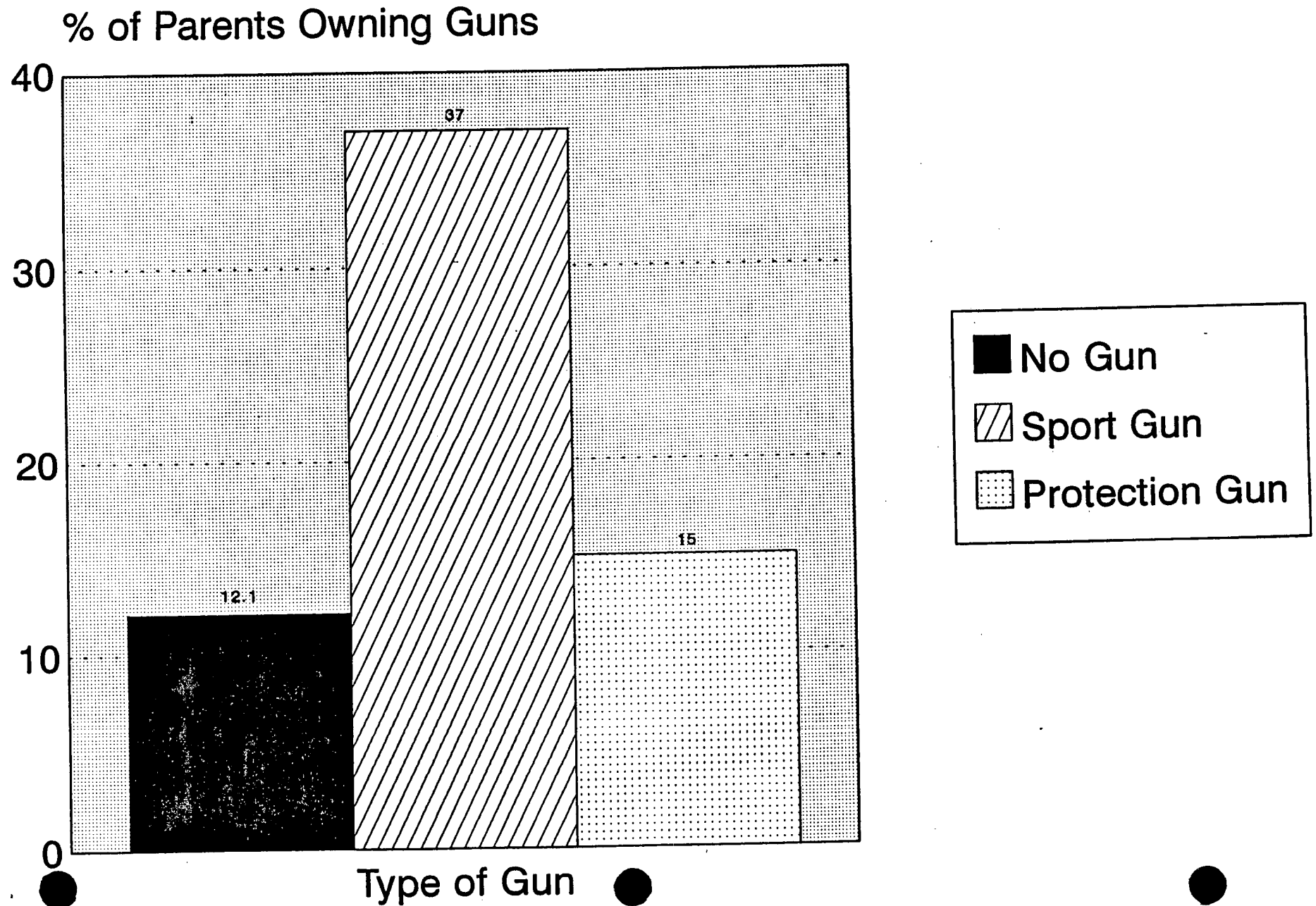
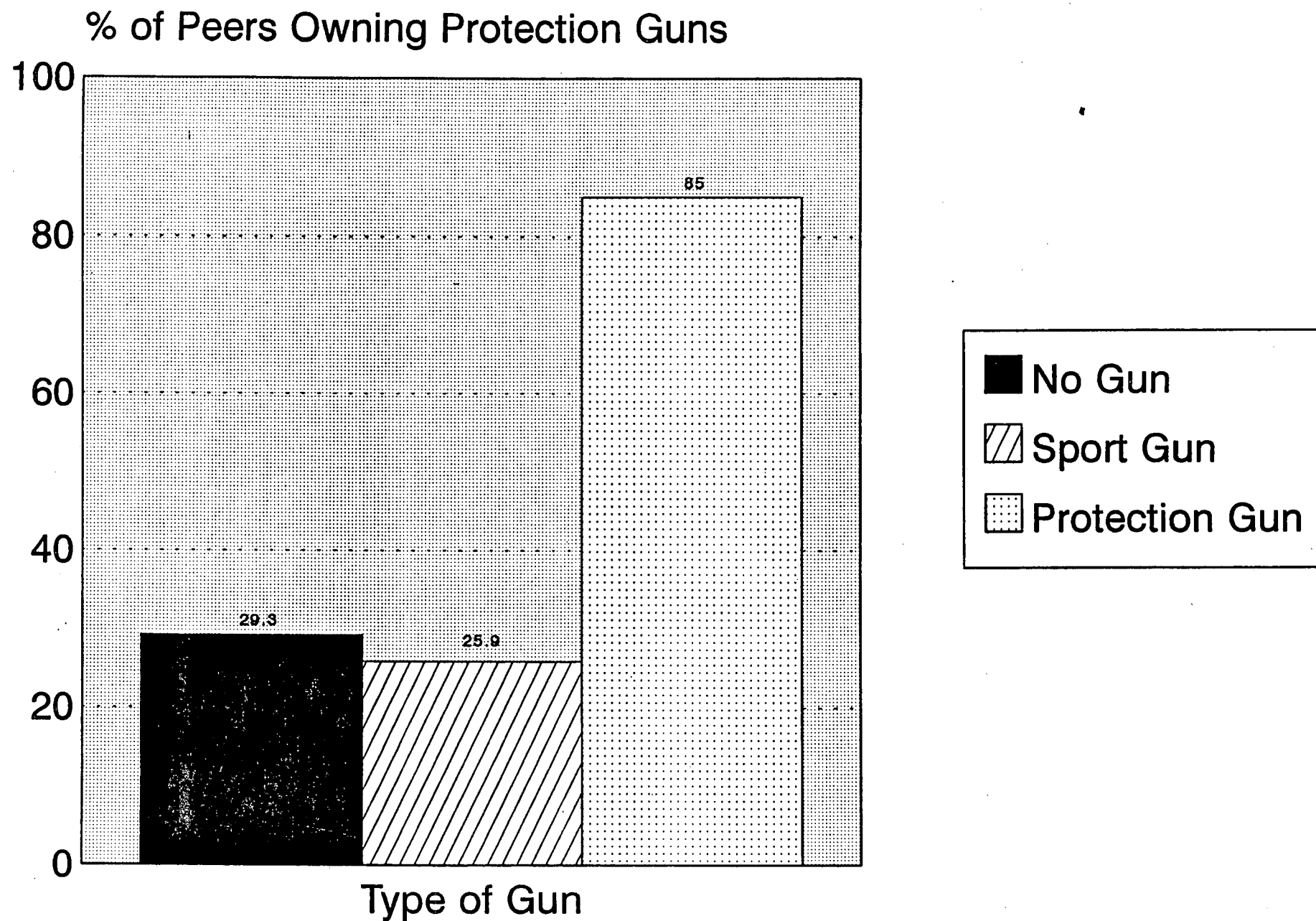


Figure 18. Percent of Peers Owning Guns for Protection by Type of Gun



## DRUG USE, DRUG SELLING AND GUNS

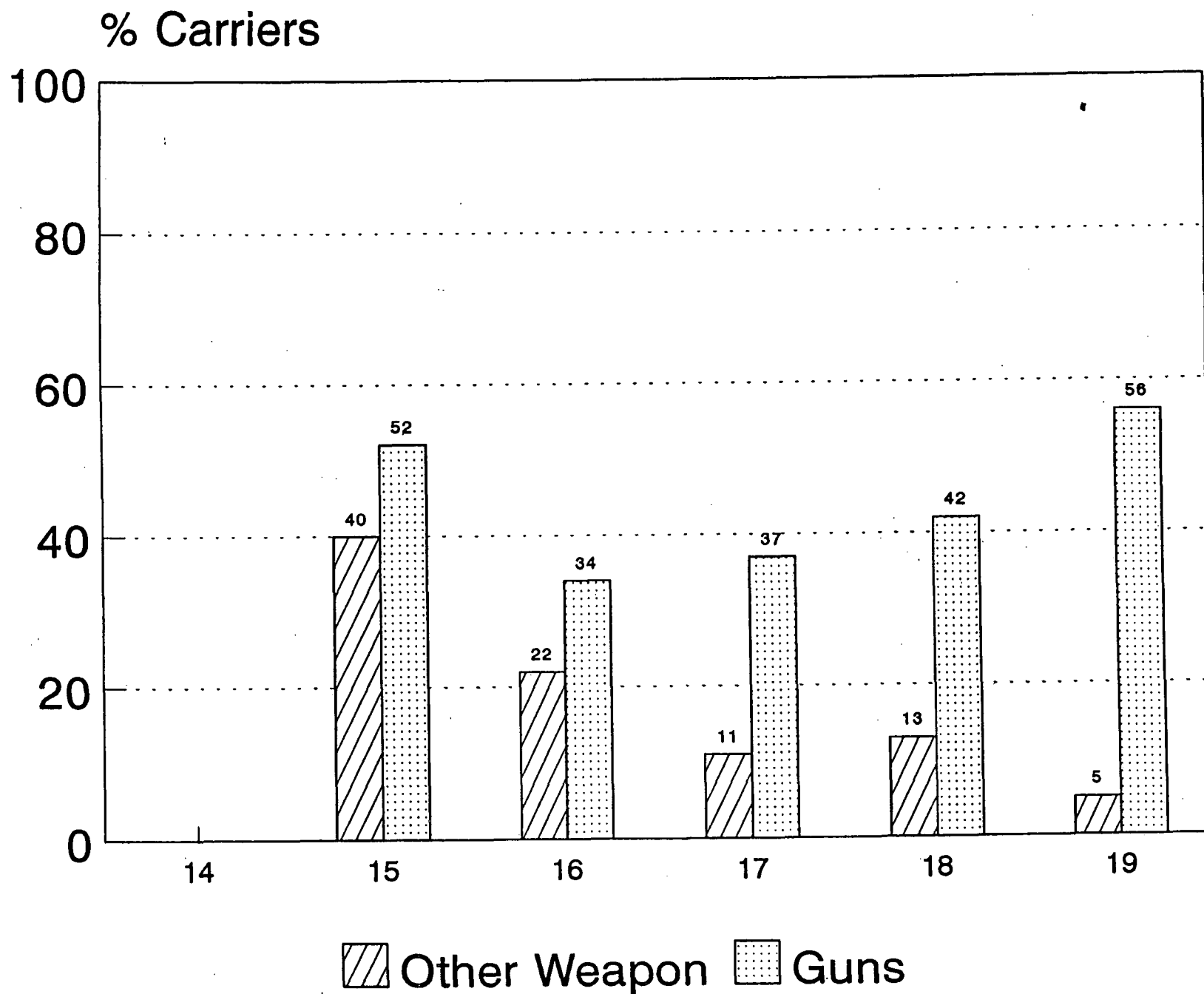
Most studies on the relationship between drug use and violence have not addressed the extent that the onset of drug use is associated with a subsequent change in offending. This type of information is crucial because it narrows down the inference that drug use rather than any other event influences subsequent delinquency. The question is particularly relevant for our understanding whether certain forms of drug use (and drug dealing) are associated with an increase in individuals' violent offenses and the carrying of concealed weapons, particularly guns.

Changes in delinquency as a function of drug use have been examined in the oldest sample of Pittsburgh Youth Study (average age of youngsters between 14 and 17) to answer the question whether increases and decreases in delinquent activities can be associated with the onset of drug use.

### Conclusions

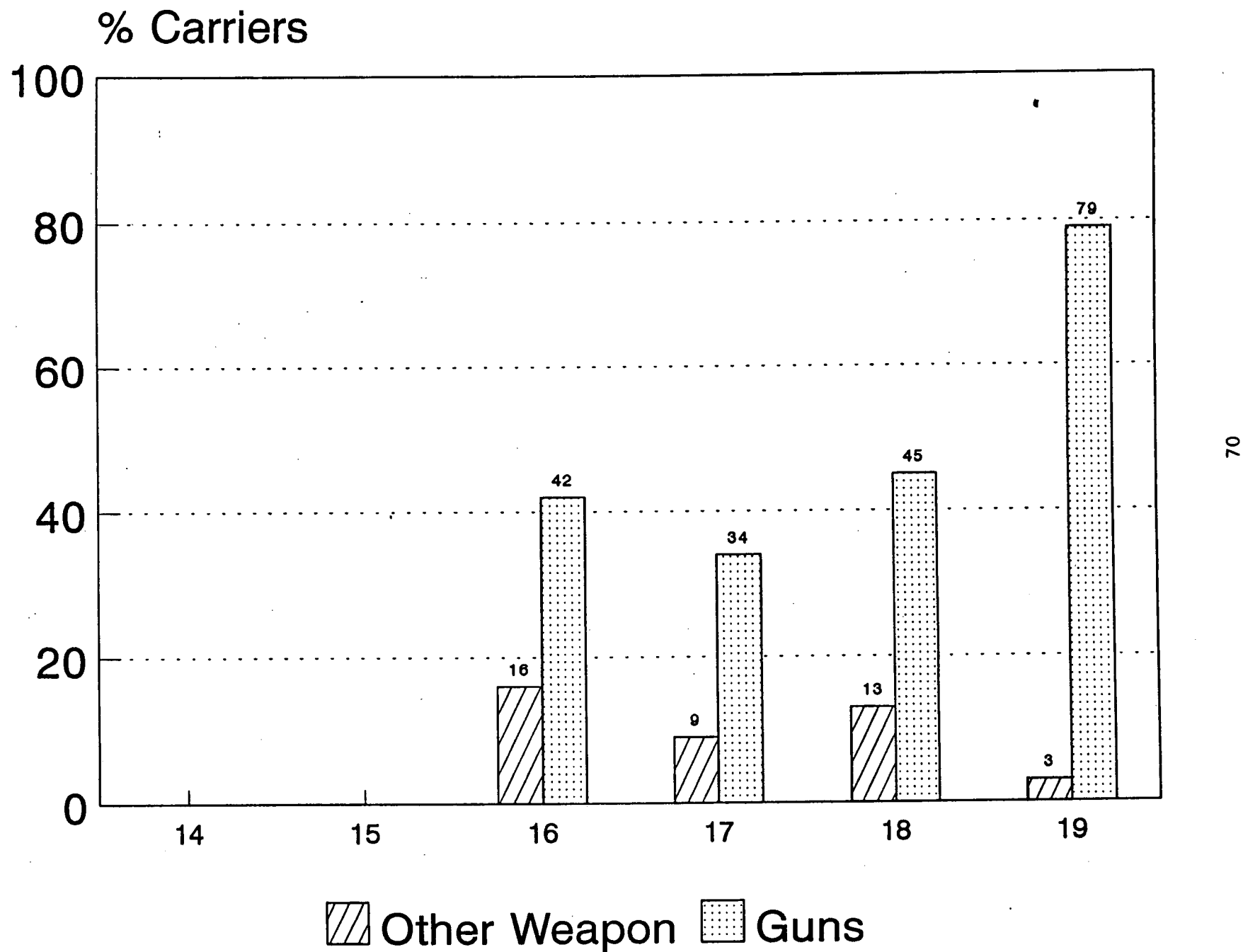
- o *Drug use and violence.* The mean number of violent offenses (forced sex, strong-arming, attacking someone with a weapon, and gang fights) increased by a factor of five from the 6 months prior to compared to the 6 months concurrent with the onset of drug use. Also, the frequency of boys' carrying a concealed weapon increased by a factor of nine from the 6 months prior to the onset of drug use compared to the 6 months concurrent with the onset of using drugs.
- o Continuation of drug use was associated with an increase in violent offenses and an increase in carrying a concealed weapon.
- o *Discontinuation of drug use.* When boys discontinued their drug use, their violent offenses also decreased.
- o *Drug selling and violence.* The onset of boys' drug selling was associated with an increase in violent crime.
- o The percentage of drug dealers carrying a gun steadily tended to increase between the ages of 16 and 19 (Figure 19), while the rates for their carrying other concealed weapons decreased (but note that at age 15 the percentage of males carrying a gun and carrying an other concealed weapon were both high).

**Figure 19. Percentage of Drug Dealers Carrying Concealed Weapons**



- When restricting drug dealers only to those who sold drugs other than marijuana (Figure 20), almost 80 percent of the participants who sold hard drugs at age 19 carried a gun.
- Conversely, of all boys who reported carrying a gun at age 19, 64.5% also reported selling drugs in the same year.

**Figure 20. Percentage of Hard Drug Dealers Carrying Concealed Weapons**



## DRUG USE AND VIOLENCE

A relationship between drug use and delinquency is well established in the literature (Huizinga, Loeber, & Thornberry, 1993a, 1993b; Esbensen and Huizinga, 1993; Fagan, 1993; Harrison and Gfroerer, 1992; Dembo et al., 1991; Johnson et al., 1991; White 1990; Elliott, Huizinga, and Menard, 1989, among others). While many studies have examined the relationship between drug use and general delinquency, few studies have examined the relationship between drug use and violence, especially in general population samples.

Data from the Denver Youth Survey (DYS), a study based on a probability sample of high risk children and youth, suggests that there is a relatively strong relationship between drug use and violence. Using self-report data, that has been screened so that only acts of violence resulting in injury are included (bruised, cut, bleeding, unconscious, hospitalized), some preliminary findings are described below.

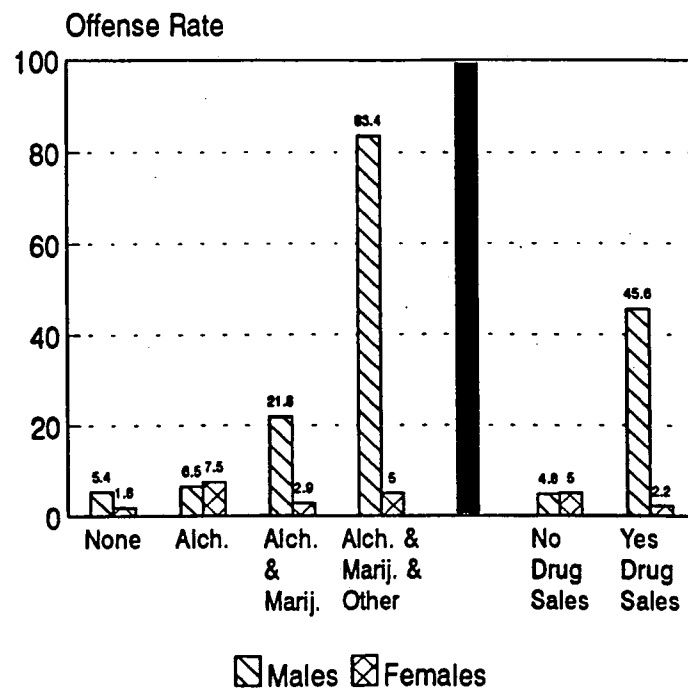
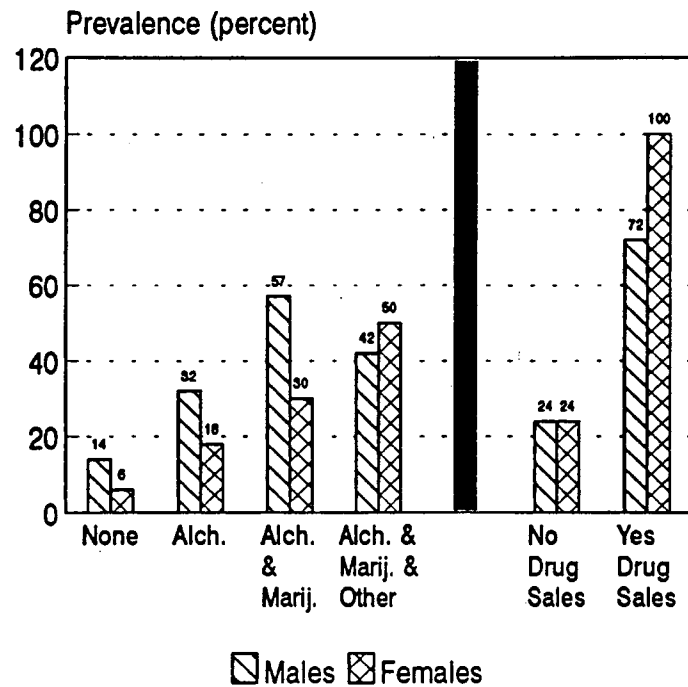
### Comorbidity of Drug Use and Violence

There is a relatively strong concurrent relationship between drug use and delinquency. In Figure 21, the prevalence of violence and violence offense rate (i.e. the average number of violent offenses committed by a violent offender) are provided for a No Drug Use Group and for three Drug Use Groups. These data are taken from the 1991 survey, using the adolescent subsample who were 14, 16 and 18 years old that year.

As can be seen in the figure, the prevalence of violence among the drug using groups is more than double the prevalence of violence in the non-using group. This finding holds for both boys and girls. In addition, in data not shown, drug users (alcohol, marijuana, and other drug user groups) account for 72% of violent males and 73% of violent females. Also, among males, the average number of violent acts committed by a violent offender is substantially higher among marijuana and other drug users. In fact, these violent drug users constitute only 9% of males, but account for 74% of all violent acts committed by males.

In addition, being involved in drug sales (marijuana and/or other drugs) is also clearly related to involvement in violence. As seen in Figure 21, among male drug sellers, 72% have committed violent offenses as compared to 24% for non-sellers, and on the average the sellers commit about 46 violent offenses per year, compared to only about 5 violent offenses for non-sellers. Similarly, all female drug sellers report involvement in violent offending, although at a relatively low rate of only 2 offenses per year.

**Figure 21. Prevalence and Offending Rate of Violence Among Non-drug Using and Drug Using Groups**



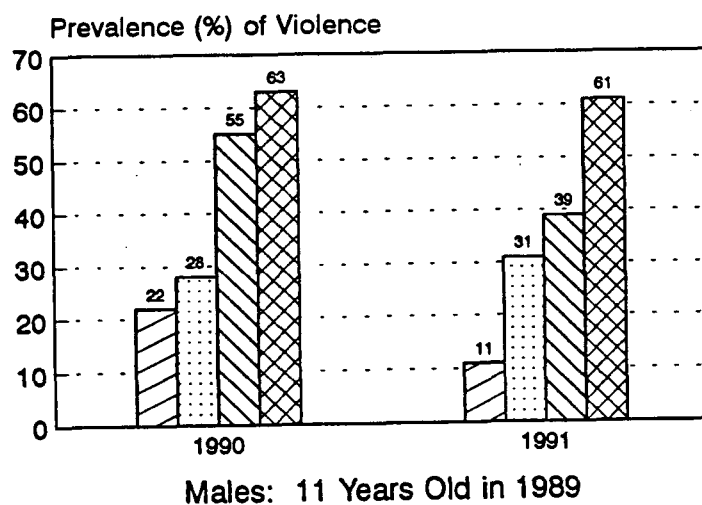
### **Drug Use as a Risk Factor for Future Violence**

While the concurrent relationship of drug use to violent behavior is quite evident, there is also some indication that among males drug use is a risk factor for future violence. Figure 22 provides data from the 1989, 1990, and 1991 surveys, indicating involvement in violence as a function of prior year involvement in violence and drug use. Data for the 11 year old cohort and 15 year old cohort are used for illustration. As seen in the figure, among males who are non-violent, a greater percentage of drug users are engaged in violence in the following year. (In this figure drug use includes any use of alcohol, marijuana, or other drugs.) Similarly, among individuals who are violent in a given year, a greater percentage of drug users maintain their violent behavior in the following year. Although the sample sizes are small so that results only approach statistical significance, the findings hold across cohorts and years, thus buttressing the strength of the findings.

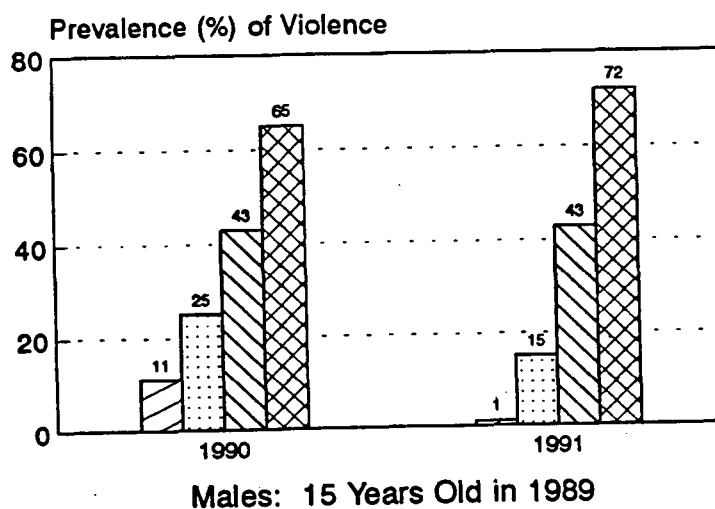
### **Drug Use as a Cause of Violence**

It must be carefully noted, that none of the findings presented here indicate that drug use is a direct cause of violence. First, additional data from the DYS delinquency measure indicate that for the vast majority (over 80%) of violent offenses, youths report that they did not use drugs (including alcohol) before being involved in the violent incidents. Thus, in general, it does not appear that the immediate pharmacological effects of drugs are involved in the majority of violent acts. Second, the relational data presented are insufficient to draw causal inferences. Much additional work is needed to understand the role drug use may play in violent behavior, both directly and indirectly by affecting mediating factors that lead to violence. Nevertheless, there is a clear indication of a robust relationship between drug use and violence, a relationship that warrants continuing investigation and one that suggests the importance of multimodal treatment and intervention strategies.

**Figure 22. Prevalence of Violence as a Function of Prior Year Violence and Drug Use**



□ Neither in Prior Year    □ Prior Year Drug Use  
 ▨ Prior Year Violence    ▩ Both in Prior Year



□ Neither in Prior Year    □ Prior Year Drug Use  
 ▨ Prior Year Violence    ▩ Both in Prior Year

## **THE RELATIONSHIP OF EMPATHY AND GUILT TO PHYSICAL AND NON-PHYSICAL AGGRESSION IN ADOLESCENCE**

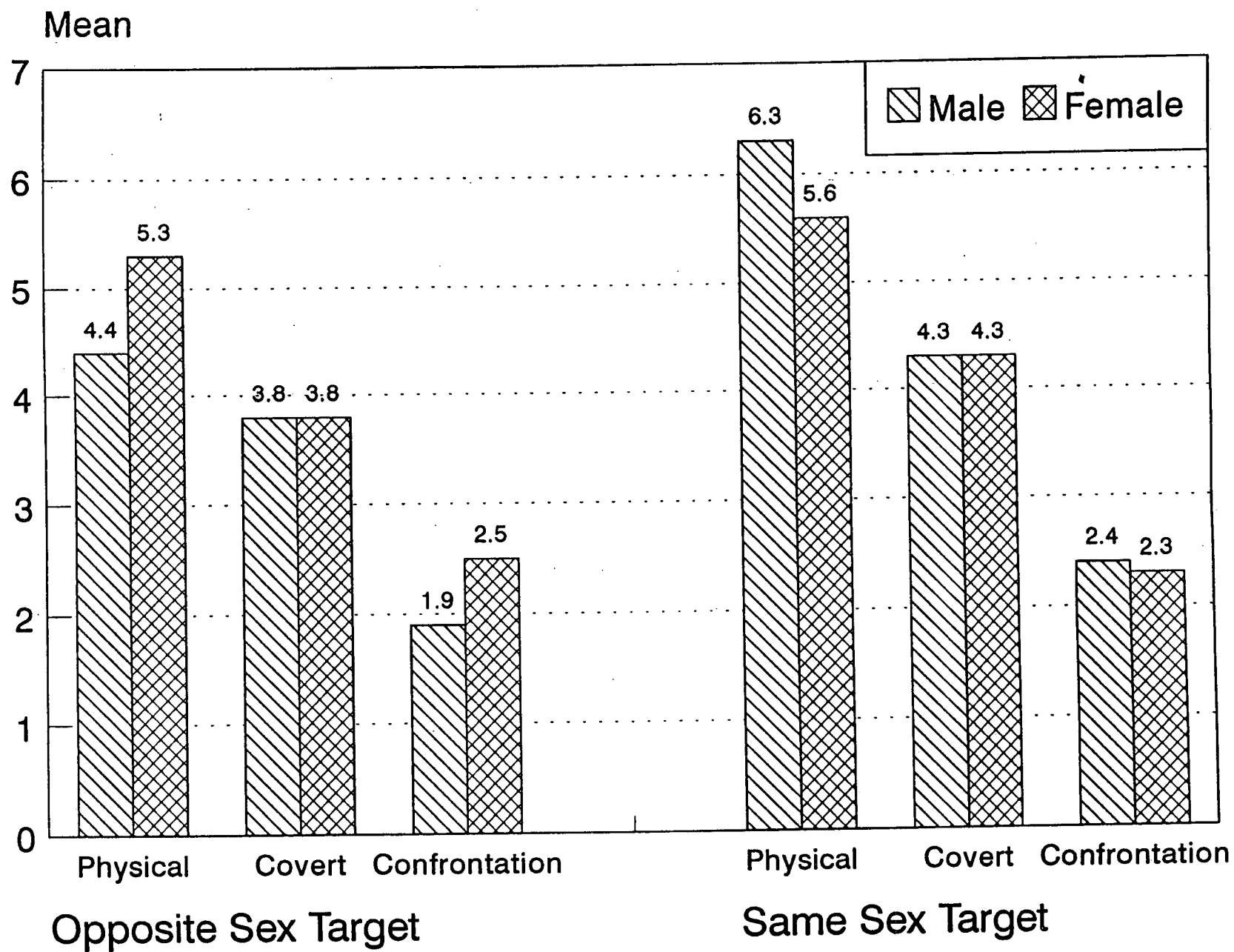
It is often suggested that empathy and guilt play a role in the reduction or inhibition of aggressive or antisocial actions toward others. To explore this issue in the high risk sample of the Denver Youth Survey (DYS), three kinds of aggression, previously described in the research literature, were identified (Orozco and Huizinga, 1995). The first kind of aggression is physical aggression - hitting, fighting, physical assaults. The second kind of aggression is social or covert aggression - the manipulation of group acceptance through alienation, ostracism, character defamation (getting people not to like the "victim" or exclude them from social groups). This form of aggression has been found to be more prevalent among adolescent girls than adolescent boys. The third kind of aggression is verbal or confrontational aggression - arguing, swearing, name calling.

Before examining the relationship of empathy and guilt to these forms of aggression, it is helpful to examine the differences between boys and girls in these forms of aggression. As seen in Figure 23, based on mean frequency scores, physical aggression is the most frequently occurring form of aggression for both sexes, followed by covert and then confrontational aggression. Interestingly, girls appear more physically aggressive towards boys than boys are to girls. Gender differences also were found for empathy and guilt, with girls having significantly higher empathy and guilt scores than boys.

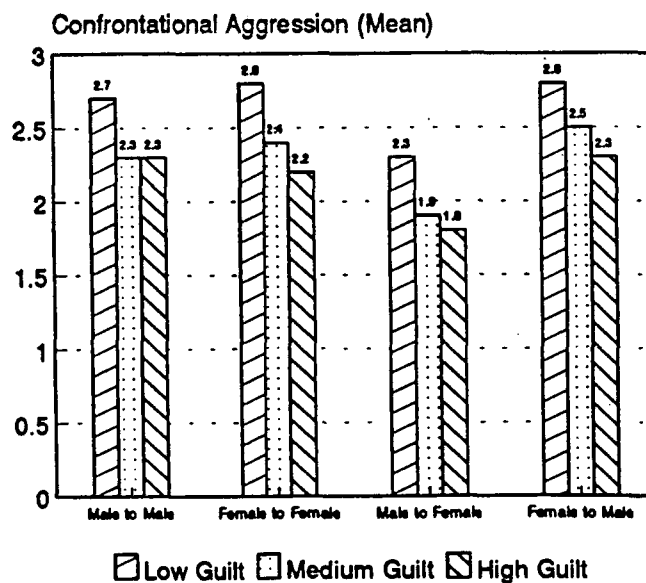
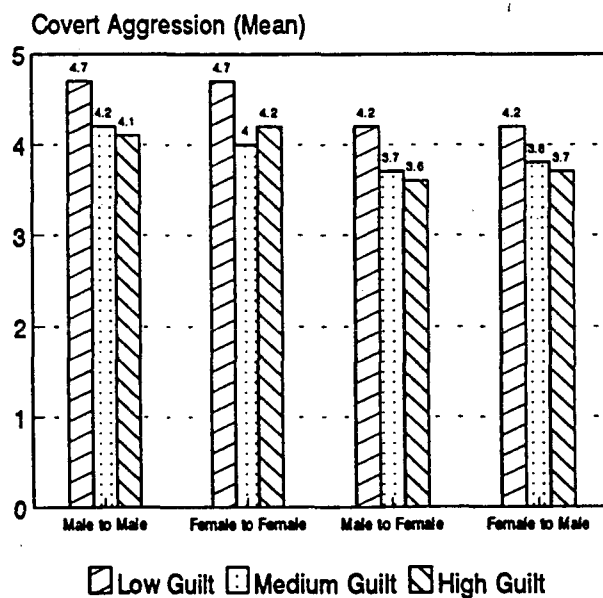
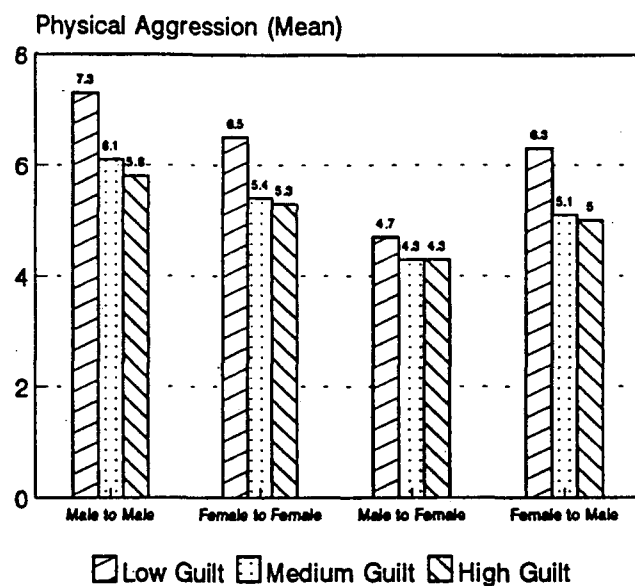
Because of these sex differences in aggression empathy, and guilt, the relationship of empathy and guilt to the three forms of aggression were analyzed separately by sex of offender and sex of target or victim. Empathy and guilt were each divided into three levels, high, medium, low and the mean frequency aggression scores in each group were examined. The results for empathy were consistently not significant. That is, except for one instance, all of the differences in aggression between high, medium, and low empathy groups were non-significant regardless of sex of offender or sex of victim.

As can be seen in Figure 24, however, guilt had a strong effect on physical, covert, and confrontational aggression. Those who report having low amounts of guilt stemming from involvement in delinquent behavior, have the highest levels of physical aggression, highest levels of covert aggression, and the highest levels of confrontational aggression.

**Figure 23. Mean Aggression Scores by Gender**



**Figure 24. Aggression by Levels of Guilt**



In data not shown, these results were confirmed in regression analyses that indicated that regardless of sex of offender or sex of victim, guilt was influential in limiting the level of all three forms of violence, with the greatest effect being for physical violence.

In conclusion, it should be noted that guilt accounts for only a small but substantial proportion of the variation in aggression scores (generally 4-6% for physical aggression). Clearly other factors need to be considered. However, given the lack of relationship between empathy and aggression, the effectiveness of intervention strategies designed to increase empathetic feelings and responses seems dubious, especially if these findings can be replicated.

## SUMMARY

This report covers a variety of topics related to violent offending in adolescence. Beginning with an examination of the epidemiology of violence, it was observed that for many youth involvement in violent behavior begins early, often before the teenage years. By the mid-to-late teenage years approximately 20 percent of males and 10-15 percent of females were involved in violent behavior. Interestingly, although girls displayed an expected age curve peaking in mid-adolescence and then declining, the anticipated reduction in violence during late adolescence for males was not yet in evidence at any of the three sites. A continuing prevalence rate of about 20 percent held through age 19.

Not all youth who are involved in violence are involved at the same rate. A group of chronic offenders, those with extremely high rates of involvement in violent behavior, were identified. This group of chronic offenders, although constituting only a small proportion of all youth account for the majority, over 75 percent, of all violent offenses. These youth are versatile, being involved in a wide range of other offenses as well. A large proportion of these chronic offenders began their violent behavior early, often before the teenage years. Although, a large proportion of these offenders are arrested, for most, their initial arrest for any offense occurs long after their violent careers have been initiated. In addition, one-third to one-quarter of these chronic offenders have no arrest record. These observations suggest the importance of both early prevention efforts and interventions following arrest.

In addition to early onset of violent behavior, there are some common themes running through the various findings. First, the influence of peers on violence, as in general delinquency, is strong. Involvement with delinquent peers is a strong, proximal factor influencing involvement in violent behavior. The peer group is even more influential if it is a delinquent gang. The replicated findings clearly indicated the social facilitation of violence during the years an individual was a member of a gang.

Examination of variables involved in predicting onset, identifying risk factors, and examining other explanatory variables also were consistent in identifying psychological processes, such as attitudes about delinquent behavior and guilt feelings about being involved in violence, as major influences on violent behavior. There was also indication that changing these personal attitudinal factors may have a direct influence on reducing future

levels of violence.

The role that child maltreatment may play for some violent individuals, the relationship between drug use, drug selling and violence, and the effect of carrying guns for protection on violence and other delinquency were also clearly indicated.

Overall, the varied findings continue to suggest the importance of prevention efforts. These efforts must occur early, before violent careers are well established and usually before contact with the juvenile justice system occurs. They must be comprehensive to deal with the multiple behavioral and personal problems characteristic of these individuals. The findings about resilience are very encouraging, indicating that malleable factors that reduce violence exist and provide opportunities for intervention efforts. These same findings, however, also suggest that interventions must be active over a multi-year period. Thus, early, comprehensive, and long-term interventions seem clearly needed.

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