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PROGRAM OF RESEARCH ON THE CAUSES AND CORRELATES OF DELINQUENCY

ANNUAL REPORT 1995-1996

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EXECUTIVE SUMMARY
ANNUAL REPORT 1995-1996
PROGRAM OF RESEARCH ON THE CAUSES AND CORRELATES OF DELINQUENCY

The Program of Research on Causes and Correlates of Delinquency (PRCCD), involving the Denver Youth Survey, the Pittsburgh Youth Study, and the Rochester Youth Study, has now been in existence for almost ten years, with data collection having started in 1987-88. The 4,500 participants in the three cities have been regularly interviewed during that period and their lives have been recorded in detail. Consequently, more is known about the delinquency, substance use, and mental health problems in this group of individuals than of any other study population in the U.S.A.

The Office of Juvenile Justice and Delinquency Prevention (OJJDP) has financially supported the three projects of PRCCD throughout the last ten years, initially for data collection, and in later years, for data analyses. In so doing, OJJDP has effectively created the largest data set on young individuals available as they grew up in inner-cities from ages six through their early twenties (the range of years varies for different age samples). During the last ten years, serious delinquency in the three cities has much increased, and the study participants have followed suit. The data from the three studies make it possible to address many crucial questions pertaining to the origins of serious delinquency, serious substance use, and serious mental

health problems.

The following report was prepared by the three sites of PRCCD and covers work accomplished during the grant year 1995-1996. The report will present the results of:

(a) Collaborative analyses across the sites. The collaborative analyses serve several functions: they can help to duplicate findings across sites, or help to exemplify why certain findings apply to one site (or population) rather than other sites. In addition, the collaborative analyses uniquely make it possible to aggregate data across the three sites in order to study phenomena (such as dealing in illicit drugs other than marijuana), which because of their low base-rate are impossible to study for a given site.

(b) Individual analyses, specific to each site. A selection of site-specific analyses are presented, partly prompted by the concerns for information from OJJDP staff, and partly prompted by the interests of individual researchers.

The following is a brief summary of key findings that are detailed in the following report. The source of each finding is indicated in parentheses which refer to section numbers in this report.

Precocious transitions to adulthood.

Using data for male participants in all three studies at Denver, Pittsburgh, and Rochester, the following findings concern the consequences of early involvement in delinquency and drug

use. Specifically, we looked at the impact of delinquency and drug use on teenage pregnancy, parenthood, school dropout, independent living, and the total number of precocious transitions that each participant experienced. Core findings are:

- ◆ At all three sites early delinquency and drug use increased the probability of being a school dropout, as well as the total number of transitions (1.2).
- ◆ In Rochester and Denver, early delinquency and drug use also increased the probability of teen pregnancy, parenthood, and independent living (1.2).
- ◆ Overall, these findings point to the importance of examining consequences, as well as the cause, of delinquency and drug use. Involvement in these behaviors can disrupt human development in a number of areas (1.2).

Violence.

- ◆ The onset of violence in males already accelerated between ages 11 and 16; the rate of onset was higher for African-American compared to Caucasian males (3.3).
- ◆ Predictors of the onset of violence in males after age 13 were a high anxiety score, lack of guilt feelings, inconsistent discipline by the parent, and physical

punishment by the parent (3.3).

- ◆ Among the best correlates of "ever" onset of violence in males were depressed mood and the presence of hyperactivity (3.3).
- ◆ Protective effects for violence in males were a high score on achievement tests, and to a lesser extent, shy/withdrawn behavior (3.3).
- ◆ The stability of violence was high: males who were initially violent were eight times more likely to be violent later compared to the risk of initially nonviolent males becoming violent later (3.3).

Guns, drugs, and victimization.

- ◆ In the Pittsburgh Youth Study, 9.4% of males in the oldest sample had been killed or wounded by guns by age 19; all of the homicide victims were African-Americans (3.1).
- ◆ Victims, prior to their victimization, tended to be serious delinquents, and had engaged in gang fights and drug selling (3.1).
- ◆ Victims tended to carry a hidden weapon, and own a gun (3.1).

- ◆ Victims tended to have poor academic performance, were less supervised by their parent, had poorer communication with their parent, were not close to their mother, and had a father with a history of behavior problems (3.1).
- ◆ The majority of the victims had a juvenile court record prior to the victimization (3.1).
- ◆ The prevalence of carrying a gun increased between the ages of 17 and 19. In contrast, the prevalence of victimization remained relatively constant (3.4).
- ◆ Carrying a gun and victimization were strongly related. This association was independent of concurrent forms of serious delinquency (3.4).
- ◆ Victimization predicted carrying a gun better than the reverse. This may suggest that one of the reasons of the proliferation of guns is a heightened level of victimization (3.4).

Marijuana sellers and sellers of other illicit drugs

- ◆ About a quarter of males in the three studies admitted to have dealt in marijuana by about age 18, and one in ten admitted to have dealt in other illicit drugs, such as LSD,

cocaine, crack, etc. (1.1).

- ◆ Whereas there were no ethnic differences in the prevalence of selling marijuana, more African-American or Hispanic than Caucasian adolescent males sold other illicit drugs (1.1).
- ◆ By about age 18, 10% of the drug sellers sold illicit drugs about daily (1.1).
- ◆ Sellers of other illicit drugs tended to use marijuana but not other illicit drugs (1.1).
- ◆ The onset of selling of other illicit drugs was concurrently associated with males' higher drug use, more favorable attitude to drugs, more positive attitude toward delinquency, gang membership, peer delinquency and drug use, and lower parental supervision (1.1).
- ◆ The best predictors of selling of other illicit drugs were: gang membership, association with delinquent peers, marijuana use, and African-American or Hispanic ethnicity (1.1).

Gang membership and delinquency

- ◆ Approximately one third of the subjects in the Rochester Youth Development Study were members of street gangs at some

point prior to the end of high school (4.2).

- ◆ Although constituting only one third of the people, gang members were responsible for two thirds of all self-reported delinquent acts (4.2).
- ◆ The contribution of gang members to the overall volume of delinquency was particularly pronounced for serious and violent offenses. They reported 90 percent of the serious delinquent acts, 80 percent of the violent acts, and 73 percent of all drug sales (4.2).

Factors influencing delinquency in different settings.

- ◆ In the Denver Youth Survey, the single most important predictor of illegal behavior was the extent to which one's friends were involved in illegal behavior, a finding in common with previous research (2.2).
- ◆ The second most consistent predictor of illegal behavior was itself a form of problem behavior, school problems, a finding which reinforces previous research indicating a positive relationship among different types of problem behavior (2.2).
- ◆ The direct relationship of other variables, particularly family variables, to illegal behavior tended to be weak and

inconsistent, but these other variables may have an indirect relationship, via exposure to delinquent friends or school problems, to illegal behavior (2.2).

- ◆ Our ability to explain delinquent behavior increased with age, consistent with findings from previous research (2.2).
- ◆ Many findings in the Pittsburgh Youth Study replicated those in an earlier London (England) study. Several risk factors were the same: hyperactivity and impulsivity, low school attainment, poor parental supervision, parental conflict, an antisocial parent, a young mother, large family size, low family income, and coming from a broken family (3.2).
- ◆ Successive regression analyses showed that the most important proximate predictors of delinquency in London and Pittsburgh were variables measuring low internal inhibition, and the most important proximate predictors of low internal inhibition were child-rearing measures. Coming from a broken family was an important independent predictor of delinquency in both London and Pittsburgh (3.2).

Arrest and subsequent delinquency

- ◆ Many high risk youth were arrested and had contact with the juvenile justice system. In the Denver Youth Survey high risk sample, 53% of the youth aged 11-15 in 1987 had an

arrest sometime in the next five years. Both males and females had high arrest rates, 64% for males and 41% for females, so there is ample reason for concern about both sexes in the juvenile justice system (2.1).

- ◆ Arrests were not a very good indicator of offending behavior. In a given year, about one third of the active serious offenders were not arrested and of those arrested most were arrested for a status or a minor offense (2.1).
- ◆ Among serious violent offenders, about three quarters had an arrest at some time in the five-year period examined. Of those arrested, about two-thirds were arrested before or at the same time they committed their first serious violent offense. This suggests that if these offenders could be identified and if effective juvenile justice system interventions were available, a substantial reduction in serious violent offending would be possible (2.1).
- ◆ For many youth, arrests and juvenile justice processing did not seem to have the desired effect. The delinquent behavior of about three-fourths of first-time arrestees was no different or was higher than that of a matched control who was not arrested (2.1).

Gender differences in delinquency and victimization.

- ◆ Denver Youth Survey data replicated the common finding that males had higher rates of involvement in delinquency than do girls. Examination of developmental growth curves by gender generally showed males having higher prevalence (proportion of persons) and offending rates (average number of offenses committed by active offenders) across the 7-19 year-old age span (2.4).

- ◆ There was an expected age curve for girls peaking in the 15-16 year-old age range and then declining. Of some interest and concern, however, is the lack of major decline in offending rates among males during the later teenage years (2.4).

- ◆ There were substantial gender differences in prevalence rates of both general and violent victimization. The victimization rate for males was higher than for females. The relationship between concurrent victimization and delinquency also varied by gender. For females there was no significant relationship between general victimization and all forms of delinquency, while for males these relationships were all fairly strong (2.4).

- ◆ The relationship between assaultive victimization and various forms of delinquency was significant for both sexes.

However, there were sizable gender differences in the strength of these relationships (2.4).

Fatherhood, deviancy, and delinquency in males.

- ◆ The prevalence of teen fatherhood in the Rochester Youth Development Study sample of high-risk urban youth was 19 percent (4.3).
- ◆ Factors associated with early fatherhood in the Pittsburgh Youth Study were a subset of those associated with delinquency (3.5).
- ◆ Explanatory variables strongest related to early fatherhood in the Pittsburgh Youth Study were being old for grade, low academic achievement, coming from a broken home, living in a bad neighborhood and being African American (3.5).
- ◆ Compared to a matched control group of males of the same neighborhood, ethnicity, and age, young fathers in the Pittsburgh Youth Study were more likely to have dropped out of school, to have been in trouble with the law, and to drink, and deal in drugs (3.5).
- ◆ In the Rochester Youth Development Study, a range of risk factors and life domains were associated with teen fatherhood, including involvement in other deviant

behaviors. For example, chronic drug users and gang members were far more likely to become teenage fathers than were their counterparts (4.3).

- ◆ Cumulative risk was related to particularly high levels of teenage fatherhood; almost half of the young males with multiple deficits became teen fathers compared to only one percent of those with no or one risk factor (4.3).

Precipitating factors of teen pregnancy in girls.

- ◆ In the Denver Youth Survey, there was some direct evidence for the relationship between psychological factors and teenage pregnancy. Pregnant teens were more impulsive and socially isolated than were their non-pregnant peers. However, teens who became pregnant did not seem to exhibit an overall syndrome of problem behavior. Thus, it may be that teenage pregnancy was a more singular event and not a component of a global concept of problem behavior (2.3).
- ◆ In contrast to some other studies there were few ethnic differences between those teens who became pregnant and those who did not. In this high risk sample, African Americans were not more likely to become pregnant than were Hispanics or Anglos (2.3).
- ◆ Despite the fact that there was a consistent relationship

between teen pregnancy and drug use, with almost twice as many pregnant teens using drugs as those who were not pregnant, only 25% of those who were pregnant used drugs. Hence, while drug use among pregnant teens causes concern, pregnant teens were not heavily involved in the drug culture (2.3).

- ◆ The short-term consequences of teenage pregnancy were especially relevant. One, pregnant teens did not drop out of school in great numbers. Two, very few teens got married as a result of their pregnancies. While the former fact gives rise to optimism regarding the long-term economic prospects of pregnant teens, the latter fact is cause for concern, especially in the light of the growing number of single parents and the economic and social problems encountered by that group (2.3).

Drug selling, gang membership and firearms.

- ◆ Adolescents in the Rochester Youth Development Study who carried guns for sport posed no threat to society while those who carried guns for protection did (4.2).
- ◆ Both gang members and adolescents who sold illegal drugs were more likely to carry guns for protection than were non-gang members and non-drug sellers (4.2).

- ◆ Of these two variables, drug selling seemed to have the strongest impact on protection gun ownership (4.2).

1. JOINT ANALYSES ACROSS SITES

1.1 ARE JUVENILE MARIJUANA SELLERS DIFFERENT FROM OTHER ILLICIT DRUG SELLERS?

Welmoet B. van Kammen, Rolf Loeber, Terence P. Thornberry,
and Scott Menard

Juvenile drug dealing has been mostly studied in inner-city populations and has been consistently linked to other delinquent behaviors and drug use. For instance, previous involvement in property offenses as well as person related offenses increases the risk of boy's initiation of drug dealing (Dembo et al., 1990; van Kammen and Loeber, 1993). Also the rates of person related offenses, carrying a concealed weapon, and property crimes strongly increase when adolescents start dealing drugs indicating a deepening involvement in the world of crime when adolescents start dealing drugs. Although it has been noted that a considerable number of adolescent drug dealers are not illegal drug users when they deal, they still seem to be at risk for a greater involvement in serious illegal drug use over time (Dembo et al., 1990).

Studies that have looked at drug dealing in adolescents usually have examined the combined effect of selling marijuana and other illicit drugs because the limited number of dealers in the study sample did not allow for an investigation of selling marijuana and selling other illicit drug separately (Altschuler

and Brounstein 1991; van Kammen and Loeber, 1994). It can be postulated that since marijuana use is considered a gateway behavior for the use of other illicit drugs (Kandel and Faust, 1975), selling marijuana could also be considered a stepping stone towards the involvement in the selling of other illicit drugs. Thus, examining the onset of selling marijuana and other illicit drugs separately may enable us to address the issue whether those who deal in marijuana exclusively differ from those who are involved in other illicit drug sales in terms of ethnicity, peer relations, gang membership and school ties.

This study has the advantage in contrast to other studies that it is able to draw information from three data sets of the Denver, Pittsburgh and Rochester Youth Studies and, therefore create a large enough sample of adolescent drug dealers to examine differences between juvenile selling of marijuana and selling other drugs over a period of 5 years.

Method

Participants: Only male adolescents were included in this study because the number of female participants in the Denver and Rochester Youth Studies were small, the Pittsburgh Youth Study did not have any female participants, and only very few females overall reported drug dealing.

Since the Rochester Youth Development study recruited only 7th and 8th grade students at the beginning of their sample collection, we included from the Pittsburgh (N=506) and Denver

sample (N=298) only participants who were close in age to the Rochester sample (N=729). For Denver this meant those participants who were born in 1972 and 1974, and for Pittsburgh only the oldest sample that was in 7th grade at the beginning of the study.

Five yearly assessments from the Denver Youth Survey, 8 half-yearly assessments from the Rochester study, and 6 half-year and two yearly assessments from the Pittsburgh study were included in the analyses. To match the yearly assessments of the Denver study, the half-yearly assessments from Pittsburgh and Rochester Youth Study were combined into yearly assessments. This meant that for Year 5 only data from Denver and Pittsburgh were available.

Measures: For each of the assessments, interviewers at the three sites verbally administered to the participant the revised version of the National Youth Survey Self-Reported Delinquency Scale (SRD) and Substance Use Scale (Elliott et al., 1985) consisting of items covering drug dealing and items on the use of legal and illegal substances. At each wave, the participant was asked if he had engaged in a specific behavior in the previous six months or year. A positive answer resulted in a follow-up question concerning the frequency of the behavior in the same time period. Drug dealing was covered by two questions concerning the sale of marijuana and the sale of other illegal drugs such as heroin, LSD or cocaine. The use of marijuana consisted of one question on the use of marijuana or hashish. The 'illegal drug

use' construct included 9 questions covering the use of inhalants, LSD, cocaine, crack, heroin, angel dust or PCP, tranquilizers, barbiturates, or amphetamines.

Participants, who were classified as marijuana dealers, did not sell any other illicit drugs in the 5 years of the study, while participants who were classified as other illicit drug sellers reported the sale of other illicit drugs but could have been involved in selling marijuana as well. For analyses purposes, participants with an onset for drug selling in Year 1 were excluded from these groups since the behaviors in the year prior to Year 1 were not assessed.

Associations with delinquent and drug using peers were measured with questions covering peer involvement in theft, person related crimes, and destruction of property (7 questions) and illicit drug use (3 questions). Separate constructs were created for delinquency and drug related questions. Attitude to delinquency and illicit drugs consisted of similar questions that asked the participants how much they disapproved of these behaviors. Both set of questions were identical at all three sites and were based on questionnaires developed by the Denver group.

Gang membership consisted of question asking whether or not the participant had been a member of a gang or posse in the previous year or half year. School commitment consisted of 7 questions dealing with issues concerning homework, grades, and how much the participant liked school. For Pittsburgh, no data

were available for Year 2 and 3. Supervision consisted of two questions asking whether or not the participant had to be home at a set time on weekdays and on the weekends.

Analyses: Because of different sampling strategies used in the three studies, we elected not to weight the following results to represent population estimates.

The essence of the risk analyses was to examine changes in the rate of behaviors as a function of either onset of selling marijuana exclusively or the onset of the selling of other illicit drug use. This meant that we needed to know the level of the participants' behavior prior to the onset of drug selling. Typically, longitudinal data are arranged with each record representing the same measurements on one subject over different data waves. To link changes in delinquency to initiation of drug related behaviors, the data needed to be reformatted. This implied that, depending on the data wave in which initiation occurred, the data were aligned to include participants' reports of delinquency in the data waves prior and co-occurring with initiation. An additional variable was created that reflected the wave in which initiation took place and made it possible to divide the initiators in subgroups according to the wave in which initiation occurred.

Repeated measure analyses of variance (MANOVA) were used to compare the mean frequencies of behaviors prior to and co-occurring with initiation of illicit drug use or drug dealing. To

detect possible wave by delinquency effects, the comparisons were done for the total group as well as for the subgroups of initiators who started drug use or dealing at specific waves. Separate analyses were performed for males who either continued illicit drug use or drug dealing, and boys who discontinued these behaviors.

The procedures for the risk analyses followed the principles of Allison's (1984) event history analysis techniques. In order to predict the risk of initiation, all participants were included, i.e., also those boys who did not experience an onset. The data were formatted in such a way that each subject had as many records as there were time intervals until the onset of the drug related behavior was reported. For instance, a boy who initiated drug dealing in wave 4 was represented with three records. Participants, who did not initiate the drug related behavior by wave 5, had a total of four records in the new data set. The data of primary importance in each record included behavioral data of the previous wave (Time 1) and drug related information from the concurrent wave (Time 2).

Logistic regression was used to test the relative contribution of prior behaviors at Time 1 in predicting the risk of initiation of drug selling at Time 2 (Hosmer & Lemeshow, 1988). A variable with 4 categories representing the time interval to initiation was also included and were entered as sets of contrasts comparing the first interval with subsequent intervals. We also developed a cumulative risk score of the

predictor variables to test the likelihood of becoming a drug dealer increases when the participant score higher on this variable.

Results

The total sample of the three sites combined consisted of 1,533 participants who were on the average 13.6 years old at the start of the study and five years later were at the an age when most adolescents complete high school. The percentage of Caucasians represented only 4.7% and 18.4% of the sample in the Denver and Rochester samples, respectively, while this percentage was considerable higher for Pittsburgh (42.4%). However, the Denver and Rochester samples consisted of a sizeable percentage of Hispanics (59.7% and 18.0%) while this ethnic group was so low in the Pittsburgh sample that it could not be considered separately.

Figures 1.1.1 and 1.1.2 shows the prevalence of drug use and drug dealing for marijuana and for other drugs over the 5 years. Marijuana use increased gradually when participants became older with only 13.3% reporting to use marijuana in the first year to 26.1% of the participants in Year 5. Only 3.9% of the sample sold marijuana in Year 1 which increased to 10.5% in year 5. The percentage of marijuana sellers remained about half of that of the users during the 5 years.

An opposite picture was shown for other illicit drugs in that the percentage of sellers was higher than the percentage of

users in all except for Year 1 when 3.3% of the participants reported using other illicit drugs while only 1.8% reported selling them. These percentages increased for sellers to 9.5% in Year 5 but remained relatively low (5.4%) for other illicit drug users.

When looking at the prevalence rates for drug use and drug dealing (Table 1.1.1 and 1.1.2) separately for the Caucasians participants and the group of African Americans and Hispanics combined no significant differences were observed for the use of marijuana but the use of other illicit drugs was reported much more frequently by Caucasian adolescent males than by the group of African Americans /Hispanics. The results for drug selling were quite different with the African American and Hispanic group having a much greater involvement in selling other drugs than the Caucasians. For instance in Year 4, 6.8% of the Caucasians and 1.9% of the African American/Hispanics used other illicit drugs while in the same year .9% of the Caucasians and 9.2% of the African American/Hispanics used drugs.

For those who used drugs the frequency of marijuana use increased over the 5 years from an average of 30 times a year to an average of 75 reported uses in year 5 (Table 1.2.3). The average use of other illicit drugs was generally lower than that of marijuana and it did not increase very much over the years. Again an opposite picture manifested itself when selling marijuana was compared with selling other illicit drugs in that other drugs were sold more frequently (Table 1.1.4). In year 5,

10% of the drug sellers sold other illicit drugs almost daily. Also in Year 5, a remarkable jump in the average number of sales was observed both in the selling of marijuana and the selling of other illicit drugs, may be coinciding with most of the participants being out off high school by this time. No significant differences in the frequency of drug use and drug selling were observed in the two ethnic groups.

Table 1.1.5 shows the percentage of those who sold marijuana and other illicit drugs and also reported using these drugs in the same year. Marijuana sellers were far more likely also to use marijuana at the same time than those who sold other illicit drugs to use one of these other illicit drugs. However, the probability of other drug sellers reporting using marijuana was as high as marijuana sellers using marijuana. For instance, in Year 3 65.6% of the marijuana sellers used marijuana while only 15.4% of the other drug sellers used other drugs. However, 66.6% of the other drug sellers in Year 3 reported using marijuana use. No significant correlations could be found between the frequency of selling and the frequency of use which seems to indicate that there may be other reasons for drug sellers besides providing for their own drug needs.

Did participants change in their behaviors and attitudes when they started selling illicit drugs? Table 1.1.6 compares behaviors and attitudes that have been associated with drug selling in the year prior versus the year in which the drug selling started for the group who became involved in the sale of

marijuana exclusively versus the group who had an onset of illicit drug selling. Generally, behaviors and attitudes significantly changed in the negative direction when participants started to deal drugs. For instance gang membership increased from about 29% in the year prior to the onset of drug dealing to more than 40% in the year that drug selling was reported for the first time. This was true for the onset of selling marijuana as well as the onset of selling other drugs. Initiating the sale of other illicit drugs was uniquely associated with a more positive attitude toward drugs and delinquency, peer delinquency and drug use, lower parental supervision and a higher frequency of other illicit drugs in the year that the onset of illicit drug selling occurred.

Next, we addressed the question whether any of the behaviors or attitudes as measured in the year prior to the onset of drug selling independently predicted an onset of either the selling marijuana or selling other drugs when controlling for the other behaviors. Because of the high correlation coefficients (ranging from $r=.40$ to $r=.65$) between the attitudinal variables and peer variables, we included only association with drug using peers as an independent variable from this group of variables. School commitment was not included into the regression because this variable was not available in Pittsburgh for some of the years. Also included as a predictor variable was ethnicity with the sample being divided in Caucasians as a group and African Americans and Hispanics as the other group. In order to

calculate relative odds ratios, all variables were recoded into dichotomized variables with the worst group in terms of their behavior or attitudes (coded 2) being in the top 25%.

Tables 1.1.7 and 1.1.8 shows the results from the logistic regression analyses predicting onset of marijuana selling and the onset of other illicit drug sales with behaviors and attitudes as well as illicit drug use in the year prior to onset. Being a member of a gang prior to onset, having more frequent associations with drug using peers, and prior marijuana use were significant predictors for both the onset of marijuana as well as other illicit drug selling. For instance, the odds of being a gang member in the year prior to starting drug selling was increased by a factor of almost 5 for marijuana and 2.6 for other illicit drug. Only African American or Hispanic ethnicity was a unique predictor of the onset of selling of other illicit drugs.

In a final analyses, we added all the dichotomized attitudinal and peer variables, gang participation and illicit drug use into a risk score to investigate whether likelihood of becoming a drug seller increased by having a higher cumulative risk score prior to the onset of selling. For those who had an onset of the drug dealing, we took the highest risk score in any of the years prior to onset. The comparison group constituted of those participants who did not have an onset of drug dealing in all the five years. For this group we took the highest score on the risk variable in any of the five years. Figure 1.1.3 shows the percentages of participants who had an onset of marijuana and

drug selling

in the total group for the different risk scores. The higher the risk score the greater the percentage of participant with an onset of selling for both marijuana and illicit drugs. While only 4.3% of all participants with a risk score of 0 or 1 had an onset of selling of other illicit drugs, this increased to 36.6% of the participants for the group that had a score of 5 or higher.

Discussion

The results of the study should be interpreted with some caution. First, prevalence figures of drug selling represent the diversity of sampling designs of the three studies, which consisted of over sampling high risk neighborhoods (Rochester), high risk juveniles in high-risk neighborhoods (Denver), and high-risk juveniles (Pittsburgh). Therefore, the current prevalence figures are an overestimate of the prevalence of drug selling and use by males in the three cities. Second, the results apply to males only and, therefore, do not illuminate drug selling and use by females.

Given these limitations, the results show that about a quarter of males in the three studies admitted at age 18.5 to having used marijuana in the previous year, and about 5% admitted to having used other illicit drugs, such as LSD, cocaine, crack, etc. These prevalence figures of illegal drugs sales were comparable to other reports that include adolescent inner city populations (Altschuler and Brounstein, 1991; Reuter et al.,

1990).

Although the percentage for the two ethnic groups were quite similar for marijuana use, the percentage of Caucasian participants using other illicit drugs was twice as high as the percentage reported by the group of African Americans and Hispanics. Similar differences but in the opposite direction were observed drug selling in that the percentages of participants selling marijuana was similar for the two groups, while the African American/Hispanic participants were almost three times more likely to sell drugs compared to the Caucasian participants. Thus the Caucasian group is more likely to be exposed to the drug market as a buyer/user while the African American/Hispanic participants may more likely be involved as the seller at this age.

Interesting is the finding that the great majority of the drug sellers whether they were only involved in marijuana sales or sold other illicit drugs did not use other illicit drugs themselves when dealing but both kinds of drug dealers reported an equally high prevalence of marijuana use. Although easy access to drug may be considered one of the initial motivations for adolescents to enter the drug trade, this may apply for marijuana but seems far less likely for other illicit drug dealing. Nonetheless, some drug dealers may refrain from using illicit drugs while they are dealing, but they may still be at high risk to eventually become users because of their deepened exposure to the world of drugs.

Our data also showed a strong increase in the frequency of marijuana use in the year that marijuana sales were initiated as well as in the year that other drug selling was started. The same is true for the frequency of other drug use but only for those who initiated other illicit drug sales. Thus although the prevalence of other illicit drug use is low, the frequency for of other drug use increased among those who start dealing in these drugs.

The onset of selling of other illicit drugs was also associated with concurrent boys' more favorable attitude to drugs, more positive attitude toward delinquency, gang membership, peer delinquency and drug use, and lower parental supervision to the year before he started selling. Being less committed to school was only related to the onset of selling other illicit drugs which agrees with findings Reuter et al. (1990) who showed that young drug dealers were less likely to have finished high school than their non drug dealing counterparts. A similar relationship between entry into a gang and increased level of drug sales was reported by Thornberry, Krohn, Lizotte, and Chard-Wierschem (1993).

Independent predictors of starting to sell marijuana as well as other illicit drugs were: gang membership, association with delinquent peers, and marijuana use when other predictors were controlled for. Being African-American or Hispanic ethnicity was a unique predictor for starting illicit drug sales which may reflect the population subgroup of inner city African Americans

and Hispanics that is predominantly represented in this sample. For this subgroup of the population opportunities, who usually live in the most disadvantaged neighborhoods, opportunities to get legitimate jobs are often severely constraint. Although drug dealing may be considered risky, it is considered a profitable way to earn a lot of money quickly. However, it exposes these young people to a higher risk of violent crime, being victimized themselves and ending up in jail for prolonged periods of time.

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Table 1.1.1: Prevalence of the use of marijuana and other illicit drugs among different ethnic groups:

	<u>% Using Marijuana</u>		<u>% Using Other Illicit Drugs</u>	
	Caucasian	African American/ Hispanic	Caucasian	African American/ Hispanic
Year 1	9.1	14.6**	2.8	3.4
Year 2	14.1	15.8	6.2	2.4***
Year 3	18.1	17.5	8.1	2.6***
Year 4	17.8	21.8	6.8	1.9***
Year 5	24.4	26.7	8.6	4.1*

* p < .05, ** p < .001, *** p < .0001

Table 1.1.2: Prevalence of the selling of marijuana and other illicit drugs among different ethnic groups:

	<u>% Selling Marijuana</u>		<u>% Selling Other Illicit Drugs</u>	
	Caucasian	African American/ Hispanic	Caucasian	African American/ Hispanic
Year 1	2.0	4.5*	.3	2.2*
Year 2	3.4	6.0	1.2	5.3***
Year 3	5.9	7.5	1.6	7.8**
Year 4	4.6	7.6	.9	9.2***
Year 5	11.7	10.1	3.6	11.9***

* p < .05, ** p < .001, *** p < .0001

Table 1.1.3: Mean frequency of marijuana use or other illicit drug use among users (λ)

	<u>Mean frequency</u> <u>Marijuana</u>	<u>Mean frequency</u> <u>Other illicit drugs</u>
Year 1	30.0	39.3
Year 2	40.2	21.6
Year 3	50.7	17.9
Year 4	57.1	13.2
Year 5	75.9	19.5

Table 1.1.4: Mean frequency of selling marijuana or other illicit drugs among sellers (lambda)

	<u>Mean Frequency</u>	<u>Mean frequency</u>
	<u>Marijuana</u>	<u>Other illicit drugs</u>
	<u>Sold</u>	<u>Sold</u>
Year 1	25.8	21.7
Year 2	29.9	62.5
Year 3	36.0	57.0
Year 4	38.0	87.0
Year 5	75.4	116.0

Table 1.1.5: Yearly percent of drug sellers using drugs

	<u>Marijuana</u>		<u>Other illicit drugs</u>	
	<u>Sellers</u>		<u>Sellers</u>	
	% Using	%Using	% Using	% Using
	Marijuana	Other	Marijuana	Other
		illicit		illicit
		drugs		drugs
Year 1	70.9	25.5	72.0	32.0
Year 2	68.9	20.5	72.9	21.1
Year 3	65.6	24.4	62.3	15.4
Year 4	65.2	18.9	66.6	9.9
Year 5	72.2	26.4	75.7	13.8

All comparisons $p < .001$

Table 1.1.6: Elected Behaviors/Attitudes in the year prior to versus the year during the onset of drug selling.

	<u>Onset</u> <u>Selling Marijuana#</u> N=72	<u>Onset</u> <u>Selling Other Drugs</u> N=154
Participants		
Frequency Marijuana use		
year prior to	14.0	15.6
year during	58.3***	66.9***
Frequency Other drug use		
year prior to	1.1	0.3
year during	2.7	4.9*
Average attitude to drugs@		
year prior to	2.9	3.2
year during	3.6***	3.7***
Average attitude to delinquency@		
year prior to	10.2	10.8
year during	11.0	12.5**
Average school commitment@		
year prior to	4.6	3.9
year during	4.3	4.7*
% Gang participation		
year prior to	28.8	29.9
year during	42.7*	43.7*

@ The higher the score, the more negative the effect.

Table 1.1.6: (continued)

Participants' peers

Frequency Peer delinquency

year prior to	11.9	12.9
year during	13.7**	14.0***

Frequency Peer drug use

year prior to	3.3	3.4
year during	4.3**	4.4***

Participants' parent

Average supervision

year prior to	3.3	3.6
year during	3.7	4.1*

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 1.1.7: Event history analysis predicting onset of dealing in marijuana (predictors measured in the previous year to the onset of dealing).

Variable	B	S.E.	df	p level	Significant Relative Odds
Time interval to					
Initiation			3	.1194	
Interval 2	-.4128	.2114	1	.0509	.6618
Interval 3	-.3128	.2077	1	.1321	.7314
Interval 4	-.5136	.2719	1	.0589	.5984
African American-					
/Hispanic	-.2952	.1903	1	.1209	.7444
Gang Membership	1.5807	.2008	1	.0000	4.8584
Delinquent					
Peers	1.5060	.1927	1	.0000	4.5087
Used marijuana	.4841	.1985	1	.0148	1.6228
Used other illicit drugs	.0542	.4618	1	.9066	1.0557
Constant	-6.9115	.6643	1	.0000	

Table 1.1.8: Event history analysis predicting onset of dealing in other illicit drugs (predictors measured in the previous year to the onset of dealing).

Variable	B	S.E.	df	P level	Significant Relative Odds
Time interval to					
Initiation			3	.0584	
Interval 2	-.3614	.1522	1	.0176	.6967
Interval 3	-.1394	.1451	1	.3368	.8699
Interval 4	-.3855	.1928	1	.0456	.6801
African American					
/Hispanic	1.1496	.1866	1	.0000	3.1570
Gang Membership	.9922	.1447	1	.0000	2.6971
Delinquent					
Peers	1.1472	.1338	1	.0000	3.1494
Used marijuana	.4362	.1424	1	.0022	1.5468
Used other illicit drugs	.5071	.3009	1	.0920	1.6604
Constant	-8.1463	.5518	1	.0000	

FIGURE 1.1.1
PREVALENCE OF THE USE AND
THE SELLING OF MARIJUANA

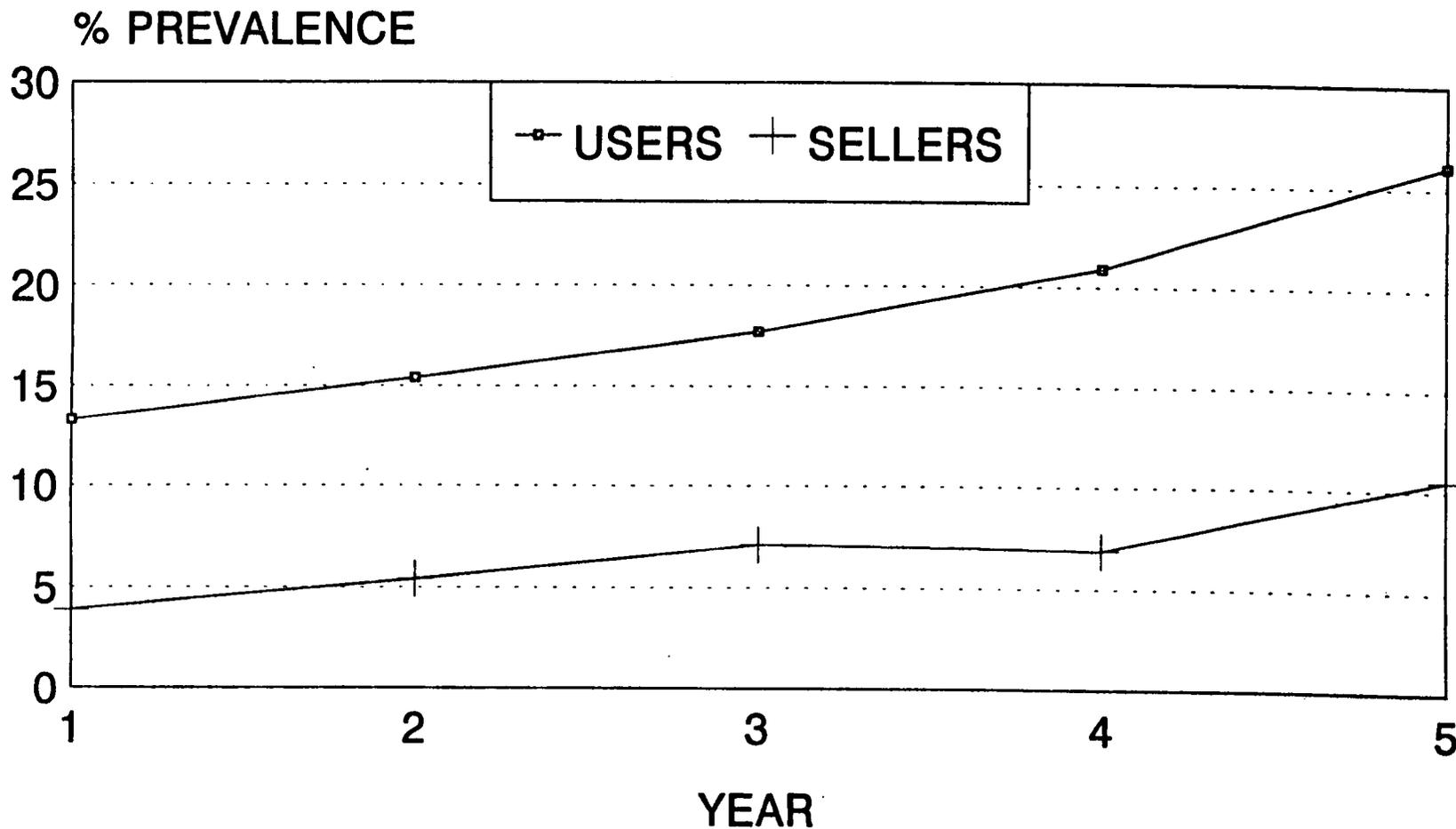


FIGURE 1.1.2 PREVALENCE OF THE USE AND THE SELLING OF OTHER ILLICIT DRUGS

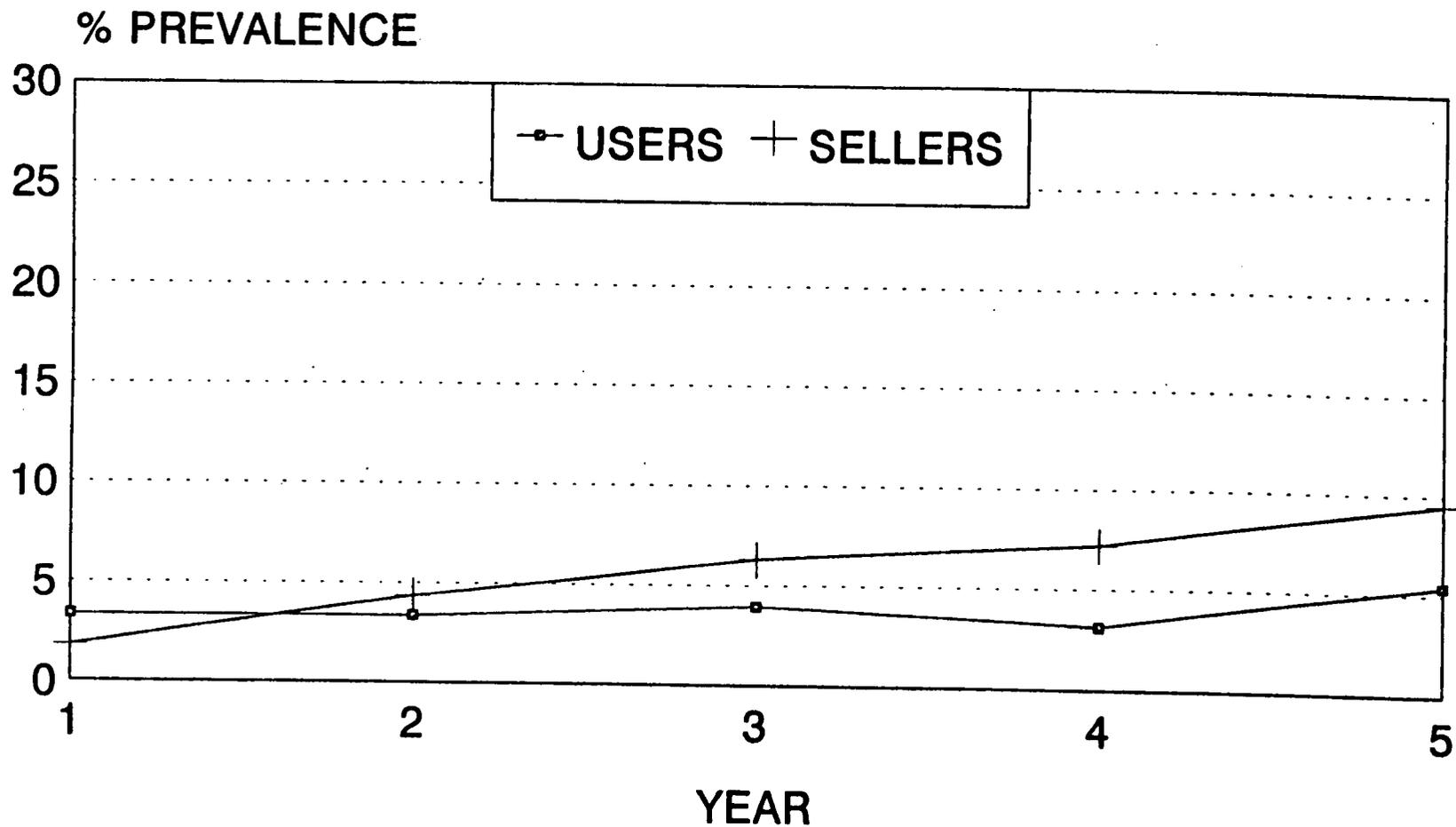
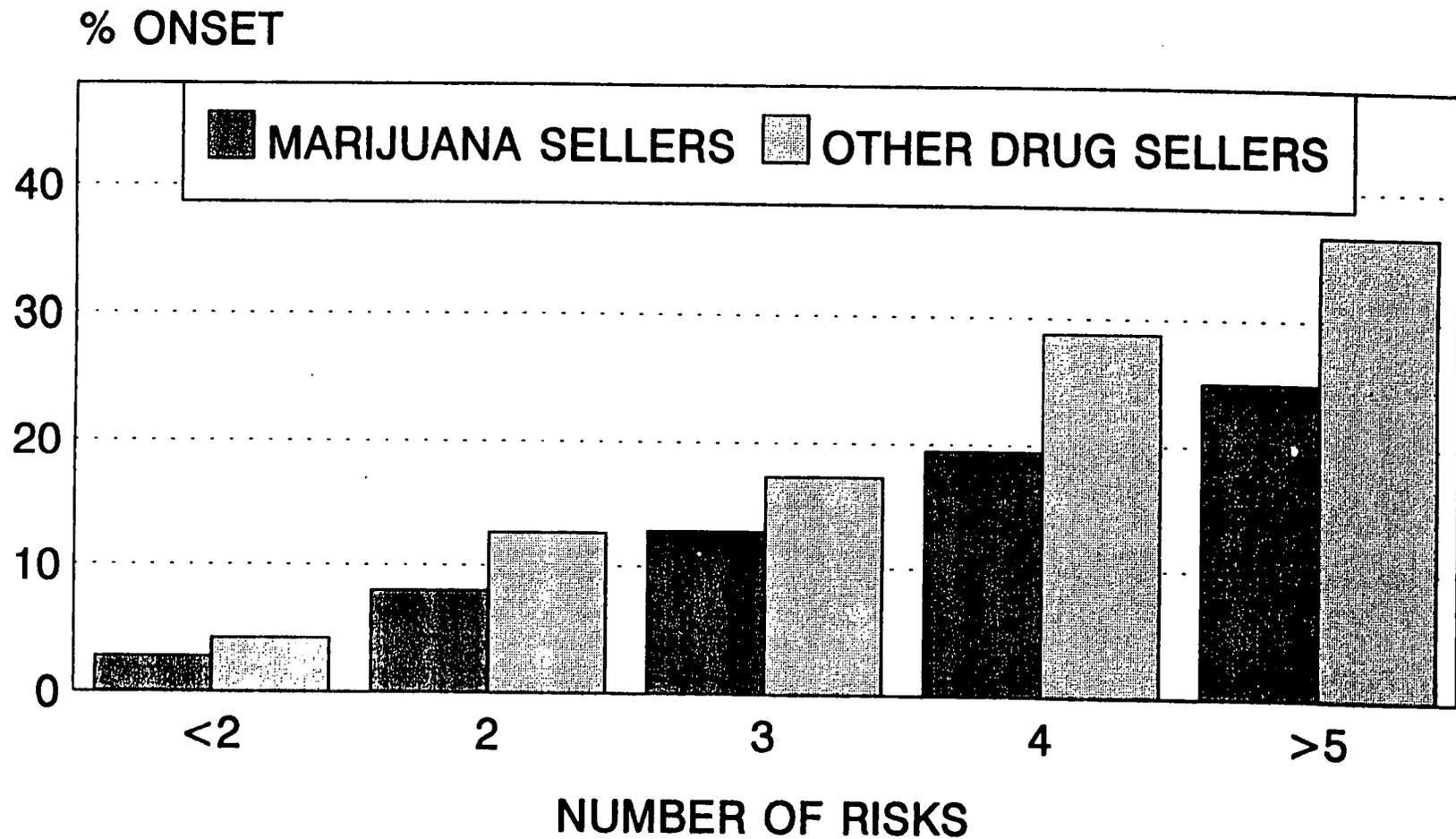


FIGURE 1.1.3
PERCENT WITH AN ONSET OF DRUG SELLING
BY NUMBER OF RISK SCORES



1.2 THE EFFECT OF EARLY ADOLESCENT DELINQUENCY AND DRUG USE ON PRECOCIOUS TRANSITIONS TO ADULTHOOD

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The life course perspective on human development expressly focuses on development across the entire life span (Baltes, 1987). In so doing, the perspective recognizes the importance of transitions in, out, and through life trajectories. Trajectories are long-term, age-graded patterns of development with respect to major social institutions such as family, education, and occupation (Thornberry, 1996). Transitions are events or short term changes that can mark turning points in a life trajectory (Cowan, 1991; Elder, 1991). There are cultural and developmental expectations about the expected sequence of life transitions that occur in the course of becoming an adult. For example, completing one's education should precede developing a career, marrying, and starting a family; similarly, marriage should precede parenthood (Kamerman, 1981; Rindfuss et al., 1987). However, the timing and sequence of these transitions are often disrupted; Rindfuss et al. (1987) found that about half of males and 60 percent of females do not follow the normative sequence of transitions.

Transitions can be either out of order, such as having children before marriage, or "off-time," such as having children

at young ages, or both. Life span theory suggests that out-of-order or off-time transitions can be associated with disruptions in normal developmental sequences, leading to short- and long-term consequences in later development (Elder, 1985). Precocious transitions, those that occur off-time, include the assumption of adult roles like curtailing education, entering the job market, or becoming a parent, before the normatively expected age.

Adolescents who enter adult roles prematurely are typically not prepared for the obligations that accompany those roles (Newcomb and Bentler, 1988). In addition, precocious transitions can increase the probability of economic burdens and of unsuccessful or failed transitions such as divorce or job instability. The behavioral disruption, stress, and structural disadvantage caused by precocious transitions can, in turn, increase the probability of continued deviant behavior during the adult years. Because of these long-term, negative consequences it is important to understand the precursors of precocious transitions so that they may be prevented.

In this study, we examine the effect of drug use and delinquent behavior during early adolescence on precocious transitions among male adolescents. These include dropping out of school, causing a pregnancy, fathering a child, and leaving home prematurely. A unique feature of the current analysis is that we use panel data from high risk samples located in three cities, Denver, Pittsburgh, and Rochester, that was expressly collected to facilitate such comparative analyses.

Drug Use, Delinquency, and Precocious Transitions

Newcomb and Bentler (1988) have suggested that certain behaviors such as drug use and delinquency accelerate entry into adult roles, and they review a number of theories and mechanisms through which this might occur. One of the main mechanisms is the "truncation of vital developmental sequences and the premature immersion into adult roles" (1988: 37).

Drug use and delinquency in early adolescence can have a number of problematic consequences in the adolescent life course. Involvement in deviant activities may increase tensions within the family, affect school work, and increase the probability that adolescents will associate with others who are involved in a broad spectrum of deviant activities. Both the use of drugs and involvement in delinquent behavior during the adolescent years can increase the precarious tension between the desire to exit adolescent roles and the need to properly prepare for entry into adult roles.

Education is considered a necessary prerequisite to entering adult roles and statuses. At a minimum, it is expected that adolescents will complete high school before entering career and family trajectories. A youth's decision not to stay in school can be characterized as a key turning point that can determine life chances long into the future (Entwhistle, 1990).

There is some evidence that both adolescent drug use and involvement in delinquency is related to dropping out of school (Elliott and Voss, 1974; Fagan and Jones, 1984; Friedman et al.,

1985; Hawkins and Lam, 1987; Kelly and Pink, 1971; Mensch and Kandel, 1988; Thornberry et al., 1985). However, this relationship may only be indirect (Kaplan and Liu, 1994) or even spurious. Fagan and Pabon (1990) have suggested that drug use, delinquency, and dropping out of high school all share similar correlates such as school and family factors and, therefore, once these factors are introduced, the impact of delinquency and drug use on dropping out may be significantly reduced or disappear. They find support for their argument when they control for social development factors such as family and school variables. On the other hand, Friedman et al. (1985) and Mensch and Kandel (1988) control for similar factors and still find a direct relationship between drug use and dropping out of school.

One of the most significant "off-time" transitions in the adolescent life course is having a child, since this has consequences for the next generation, as well as immediate and long-term consequences for the adolescent. Teen pregnancy and childbearing are therefore among the transitional events that can have a powerful influence on the life course, for adolescent fathers as well as for young mothers (Furstenberg et al., 1987; Lerman and Ooms, 1993).

Early delinquent behavior and drug use are related to sexual behavior among adolescents (Elliott and Morse, 1989; Jessor and Jessor, 1977; Newcomb and Bentler, 1988; Pugh et al., 1990; Smith, under review). Moreover, Pugh et al. (1990) and Elliott and Morse (1989) found that delinquency and drug use are causally

prior to sexual intercourse. Such behaviors in early adolescence, in turn, increase the probability of precocious transitions such as teenage pregnancy and teenage parenthood (Newcomb and Bentler, 1988; Pirog-Good, 1988; Pugh et al., 1990; Thornberry et al., under review). Hence, research indicates that early participation in delinquent behavior and the use of drugs increases the probability of either becoming pregnant or impregnating someone and also of parenthood while still in the teenage years (Newcomb and Bentler, 1988; Pugh et al., 1990; Thornberry et al., under review).

Moving out of one's parental home before graduating from high school can also be considered a precocious transition to adult status. Residential independence is an important sign of autonomy and independence from parents. Although at later ages it is usually negotiated between child and parents, if it takes place early it can involve strong conflict of expectations, which can add to its later costs. The consequences of non-family living, particularly at young ages, include mistimed marriage and parenthood, and poor educational and vocational planning (Goldscheider and Goldschieder, 1993).

Prematurely leaving the parental home is predicted to be affected by delinquent behavior or drug use. Participation in delinquency or using drugs can cause a rift in the relationship between parents and their adolescent children. Indeed, numerous studies have found that the quality of the relationship between parents and children is related to delinquency and drug use (see

Loeber and Stouthamer-Loeber, 1986, for a review of some of this research). Moreover, Liska and Reed (1985) and, more recently, Thornberry et al. (1991), have shown that deviant behavior may have a stronger effect on attachment to parents than attachment to parents has on deviant behavior. A rift between adolescents and their parents may, in turn, lead to adolescents moving out of the house to live alone, with a friend or partner, or in some other situation where they are independent of parental supervision. This further detaches these adolescents from adult guidance and support, and leaves them freer to indulge in deviant activities, and associate with like peers.

Summary and Questions for Analysis

Making the transition from adolescence to adulthood is a difficult and often times disruptive process in the life course. Adolescents are expected to prepare themselves for the roles that they will play as adults while, at the same time, conforming to normative expectations and parental expectations in regard to both their current behavior and the timing and order of the transitions they make. When adolescents deviate from behavioral expectations, a process can be set in motion whereby they become more deeply entrenched in a deviant lifestyle. As part of this process, adolescent deviant behavior may result in adolescents trying to make the transition to adult roles and statuses prematurely. These precocious transitions can in turn have significant effects on later life events and life chances.

The current analysis examines the effect of early delinquent behavior and drug use on precocious transitions among young adolescent males. While some prior research has found relationships between adolescent deviance and precocious transitions, the current study is unique in that 1) it examines the relationship between both delinquency and drug use on precocious transitions; 2) it focuses on a number of precocious transitions rather than only one; 3) it uses a sample that is at high risk for both delinquency and precocious transitions; 4) it controls for variables that may be associated with both early drug use and precocious transitions, and 5) it examines these relationships with data from three cities that were collected with the express purpose of replicating results across research sites.

Methods

Sample and Design. This study reports on data from the Program of Research on the Causes and Correlates of Delinquency, which consists of three research projects: the Denver Youth Survey, the Pittsburgh Youth Study, and the Rochester Youth Development Study. All three projects use longitudinal designs to study the developmental pathways that lead to youth offending and problem behaviors. Taken together, the three projects selected a total of 4,500 inner-city youth for study. Because of the low base rate for serious delinquency, youth at high risk were overrepresented in all three samples; however, all three

samples are probability samples which can be weighted to represent the populations from which they were drawn. All results reported in this study are based on weighted data.

In the first phase of the studies, subjects were interviewed over a period of at least 4 years. Face-to-face interviews were completed with subjects and parent or caretakers at regular intervals. In all projects, interviews lasted between one and two hours and were conducted in private settings. Respondents who moved were followed and interviewed in their new location. Sample retention has been excellent, with at least 84% of the subjects retained at each of the three sites; there is no indication of differential attrition. All projects also collected data from agencies such as police, courts, schools, and social service agencies.

A common measurement strategy was devised, which has enabled us to replicate data across sites. Common measures exist on key dependent variables such as drug use and delinquency, as well as on key predictive variables such as school performance, school attitudes, parent-child relationships, demographic characteristics of the family, and so forth. Each project also contains measurement of critical adolescent developmental transitions, although these vary somewhat in specifics as discussed below.

While 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. To make the

subjects of this analysis comparable across cities, only males of approximately the same age are included. A brief description of each design follows in order to indicate the key characteristics of each study.

The Denver Youth Survey is based on a probability sample of households in "high-risk" neighborhoods of Denver, Colorado. The survey respondents include approximately equal numbers of boys and girls, aged 7, 9, 11, 13, and 15 years old in 1988, and one of their parents, who lived in one of the more than 20,000 randomly selected households. Each child or youth and parent were interviewed annually four times from 1988 to 1992. Only the oldest two samples are included in this analysis. Data from the first through fourth annual interviews are utilized. At the first interview, these subjects were average age 14 and by the fourth annual interview they were age 17. The male subsample in Denver consists of 296 males, including 39% African American, 47% Hispanic, 5% white, and 9% other.

The Pittsburgh Youth Study 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 an initial screening which consisted of a retrospective assessment of problem behaviors, as reported by the boy, his parent, and his teacher. 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. Eight half-yearly assessments were conducted for the oldest sample in the first phase of the study. In this study, only the oldest sample of 506 boys is included. These subjects were, on average, age 13.2 at the first assessment, and by the 8th assessment they were age 17. The males in this study are 57% African American and 43% white.

The Rochester Youth Development Study started with a sample of 1,000 Rochester public school students in 1988. To maximize the number of serious, chronic offenders available for the study, the sample includes more youth from high-crime neighborhoods and fewer from low-crime neighborhoods. In addition, the sample was selected to be 75 percent male and 25 percent female. Interviews were conducted at six-month intervals (waves) between 1988 and 1992, providing nine data collection points over this 4 1/2-year period. At Wave 1 the students were in the Spring semester of their seventh and eighth grade years, and the average age was 13.5. By Wave 9, subjects were 17.5 years of age on average. The sample for this analysis includes all 729 males, of whom 56% are African American, 27% are white and 17% are Hispanic.

Measurement

Due to the design and purposes of the overall Program of Research, many measures are similar across sites, and a general description will be used in these cases. Where particular projects use a different measurement approach, this will be noted. The variables are grouped and will be discussed in three

categories: delinquency and drug use, precocious transitions, and control variables. The coding of variables is summarized in Table 1.2.1, and variable descriptors are provided in Table 1.2.2.

Delinquency and Drug Use

Common measures from student interviews are used for these variables across sites. A measure of general delinquency and a measure of substance use are used as indicators of early adolescent deviance, and as predictors of precocious transitions. These measures cumulate the frequency of responses to delinquency items, and instances of use of alcohol and other drugs across the first two years of data collection in the three projects, a period when subjects were generally 13-15 years old. Measurement is therefore temporally prior to the onset of the precocious transitions in all but a handful of cases. In the Pittsburgh and Rochester projects, data are cumulated across the first four biannual interviews; in Denver, they are cumulated across the first two annual interviews. The natural logarithm of drug use and delinquency frequencies is used owing to skewness in the data. Means for general delinquency and substance use are comparable across sites.

The general delinquency measure is a 31-item omnibus index, including status, property, violent, and public disorder offenses. Early substance use is measured by summing responses to items asking whether the respondent had used alcohol,

marijuana, crack, cocaine, hallucinogens, tranquilizers, amphetamines, or barbiturates.

Precocious Transitions

The most likely precocious transitions experienced during adolescence are causing a pregnancy, having a child before graduating from high school, dropping out of school, and leaving the parental home.

Causing a pregnancy is assessed through a positive response to a question at the 4th interview in Denver, the 9th in Rochester, and the 8th in Pittsburgh, asking whether they had ever gotten a girl pregnant. In Rochester, in addition the subjects were asked at each interview after the 5th whether they had gotten a girl pregnant in the previous time interval, and positive responses at any wave were included. In most cases, subjects were reporting pregnancies occurring before the end of high school. Percentages of male respondents reporting that they caused a pregnancy are 15% in Denver, 19% in Pittsburgh, and 24% in Rochester.

Precocious parenthood is measured by asking respondents whether they had a biological child by late adolescence (generally, prior to school graduation). The number of males reporting they fathered a child are rather variable across sites: 5% in Denver, 10% in Pittsburgh, and 14% in Rochester.

Dropping out is measured by subjects' self-report of leaving school before high school graduation. If subjects indicated that

they were not currently in school, and had not graduated they were given a score of 1 on the variable. In Denver, 18% of the boys dropped out of school, in Pittsburgh the proportion of dropouts is 19%, and in Rochester it is 27%.

The fourth precocious transition is living independently, that is, without adult supervision, before graduating from high school. Adolescents who leave the home of their parents or guardian prior to graduating from high school are considered to have left home prematurely. This measure is taken from questions in the student interview asking where the student lived, and whether or not this was with parents or caretakers. In Denver, 10% of the males live independently, compared to 4% in Pittsburgh, and 9% in Rochester.

A final precocious transition variable was created which sums the number of precocious transitions experienced by each subject. Since pregnancy and parenthood are highly correlated, pregnancy was selected. The total number of transitions variable thus ranges from 0 to 3.

Control Variables

A number of measures are included in the analysis as control variables either because of their suspected relationship with precocious transitions, or because they represent basic demographic dimensions. With the exception of the low social class measure, all variables are from student interviews, and are measured when subjects were about 14.

To measure low social class, we asked parents to indicate whether they were receiving public assistance. This is used rather than a more standard measure because of the overall disadvantaged status of our sample. The percentage of subjects receiving public assistance is 56% in Denver, 36% in Pittsburgh, and 41% for Rochester subjects.

Race/ethnicity is measured using a dummy variable for the African American race: the omitted category refers to adolescent males who are Hispanic or white. In Denver, 39% are African American, compared to 57% in Pittsburgh, and 56% in Rochester.

Family structure is assessed at the initial interview and comes from questions asking the respondent to describe whether they lived with both biological parents or in another type of family structure. Subjects are coded as 1 if they did not live with both biological parents at Wave 1. Across all sites, between 60% and 70% of subjects live in homes without both biological parents present.

Family attachment is assessed at each site with slightly different sets of items measuring the child's liking, lack of hostility, and warmth towards parents. In Rochester and Pittsburgh, the specific parent asked about is the mother or female caretaker; in Denver, all items except one refer to "parents." The Denver scale consists of 6 items and has an alpha reliability coefficient of .68. The Pittsburgh attachment scale consists of 8 items, and has a reliability coefficient of .77. The Rochester scale contains 10 items, and has an alpha

reliability of .83. Attachment means cannot be compared because of the somewhat different items in each site.

School commitment is measured through a set of 7 items at each site assessing the degree to which the subject likes school, teachers, and is involved in schoolwork. Items are highly comparable, but the range of responses for each item in the scale varies from 3 to 5. The respective reliabilities of this scale in Denver, Pittsburgh, and Rochester are .65, .56, and .70. School commitment means cannot be directly compared because the response categories varied across sites.

Results

In this analysis we evaluate the impact of early delinquency and substance use on precocious transitions among adolescent males. We expect early delinquency and substance use to increase both the probabilities of precocious transitions occurring and the overall number of precocious transitions experienced. This impact of early delinquency and substance use on precocious transitions is expected to be independent of family structure, attachment to parents, commitment to school, low social class, and race/ethnicity.

Table 1.2.3 shows correlations between early delinquency and substance use and the measures of precocious transitions for boys at each of the three sites. The table shows that early delinquency and substance use are consistently and significantly associated with all measures of precocious transitions for the

Denver and Rochester research sites. However, not all of these relationships are replicated in Pittsburgh. Six of the ten correlations are statistically significant for Pittsburgh, and early delinquency and substance use are associated with both dropout and the total number of transitions, as in the other sites. However, general delinquency is not related to causing a pregnancy in Pittsburgh, and neither general delinquency nor early alcohol and drug use are associated with fatherhood. Substance use is also unrelated to independent living in this location.

Of course, the correlations in Table 1.2.3 do not hold other variables constant. Tables 1.2.4, 1.2.5, and 1.2.6 show logistic regression equations predicting the four precocious transitions and an ordinary least squares equation predicting the number of precocious transitions for boys in each of the three sites. These equations control for family structure, attachment to parents, school commitment, low social class, and race/ethnicity. Model improvement chi-square tests show that the final equations are significantly better than equations with only the intercept included. For the sake of parsimony only significant coefficients are reported. However, all variables were included when estimating each equation.

Table 1.2.4 shows that in Denver early delinquency and substance use are strong and statistically significant predictors of all precocious transitions: causing a pregnancy, becoming a teen father, dropping out of school, moving to independent

living, and total number of transitions. The values in parentheses under the coefficients in the table are the predicted probabilities of each transition given a one unit change in the amount of delinquency or substance use.¹ For example, the difference in committing zero and 3 delinquencies results in about a 11 percent increase in the probability of causing a pregnancy when evaluated at an initial .5 probability of pregnancy. In other words, the probability of pregnancy moves from .50 to .61, a substantial change.

The table also shows the effects of control variables on precocious transitions. In general, attachment to parents reduces the likelihood of independent living. Receiving public assistance and being African American both increase the likelihood of parenthood.

Table 1.2.5 shows the same analysis for males in Rochester. The results are similar to those in Denver. Early delinquency and substance use predict all of the measures of precocious transition. As with Denver attachment to parents decreases the probability of independent living. Commitment to school decreases the likelihood of dropout and it decreases the total number of precocious transitions experienced. Public assistance

¹ These probabilities are evaluated at the 50 percent likelihood of the particular precocious transition occurring. It is important to note that since the delinquency and substance use measures are logged a change from zero to one on either scale is equivalent to about 3 (2.7) delinquencies. One unit changes in higher values of the scale represent dramatically increasing changes in the number of delinquencies that would be attributed to a one unit change in the logged variable.

increases the probability of parenthood and of independent living. Being African American has mixed effects on transition variables, increasing the probability of causing pregnancy and parenthood, decreasing the probability of dropout and independent living, and having no effect on the total number of transitions.

Table 1.2.6 shows that early delinquency and substance use have less systematic impacts on precocious transitions for males in Pittsburgh than in the other two sites. In Pittsburgh early delinquency and substance use significantly predict later dropout and the total number of transitions. However, they do not significantly predict pregnancy, parenthood, and independent living. In this location, living in a one-parent family and being less attached to parents increase the likelihood of later precocious independent living for the subject. As was true for Rochester, school commitment decreases dropout. Receiving public assistance increases the likelihood of all transitions except independent living, as well as the total number of transitions experienced. Finally, in Pittsburgh African-American males are more likely to have impregnated a girl than other adolescents.

Summary and Discussion

The current project set out to examine the consequences of early delinquent behavior and substance use for making precocious transitions to adult roles and statuses. The precocious transitions examined include causing a pregnancy, becoming a teen father, dropping out of school, and living independently. The

research involved a unique set of three samples of high risk youth and controlled for variables that may be associated with both early drug use and precocious transitions in all three sites.

To summarize briefly the results of this study, we do find support for our main hypothesis that deviance in early adolescence is associated with precocious transitions net of other key variables. The findings are particularly consistent in Denver and Rochester. Delinquency and substance use predict each of the transitions separately and the total number of transitions experienced by the youth. These findings are only partly replicated for Pittsburgh males: early delinquency and drug use predict dropping out of school and the total number of transitions. Causing a pregnancy, becoming a teen father, and living independently are not predicted by early deviance, however.

Findings from this three-site study suggest that the most clear-cut effect of early deviance is on the total number of transitions experienced, as well as on school dropout. In this sense, early deviance does seem to be interwoven with the tendency to embark prematurely on an adult-like life course, with poor skills preparation. This seems to suggest, as problem behavior theory indicates, that a general pattern of early adolescent deviance is continued in the violation of norms about age-appropriate transitions. Whatever the origins of deviance (and relevant contributing factors are controlled in these

analyses), adolescents may be embarking as early as 13 or 14 on a set of trajectories which increasingly deviates from expected developmental norms.

At the most general level, findings are consistent with the life course perspective, which argues that there is continuing interaction between the individual and the trajectories in which they are embedded, and that various life events can lead to short- and long-term consequences in the life course. There is some evidence that teenagers who are involved in early deviance have an increased probability of moving precipitously to adult roles for which they may be poorly prepared. The tendency for earlier problems to persist in later problem behaviors is partly due to what Elder and Caspi (1990) have called the "accentuation principle," which suggests that stress and adversity in early life tend to lay the groundwork for vulnerability to later stress. For example, dropping out of school, moving away from home, and becoming a parent are likely to affect educational and occupational opportunities, making life more economically and emotionally stressful, and potentially further straining relationships with significant adults whose continued support is important. As the significance of some of the control variables suggests, early deviance acts in concert with other early life disadvantages such as low attachment to parents, living in single-parent homes, and low social class.

It is clear that, for some adolescents, early delinquency and substance use have little effect on transitions, indicating

change as well as continuity in life course patterns (Rutter, 1992). Some youth are able to stay on track in major ways despite their early delinquency and substance use. This is an important and encouraging finding, and we need to continue to study the discontinuities in problematic behavioral trajectories for clues relating to turning points when interventions can be maximally effective.

It must be noted that there is some unevenness in the impact of early deviance, depending on the transition in question, and depending on the urban study site in question. Whereas early deviance affects all transitions for Denver and Rochester males, only two transitions are predicted for Pittsburgh males. There are also differences in the impact of the control variables, although all effects make good theoretical sense. These intriguing findings raise the possibility that the urban contexts and populations represented in these study sites are different in ways not captured in our analysis, and we plan to investigate this further.

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Table 1.2.1: Coding of Variables

<u>Variable</u>	<u>Categories</u>
Early Delinquency and Substance Use*	
General Delinquency	Continuous (natural logarithm)
Alcohol and Drug Use	Continuous
Precocious Transitions	
Pregnancy	0=Never Impregnated 1=Impregnated
Parenthood	0=No Biological Children 1=Has Biological Children
Dropout	0=Not a Dropout 1=Has Dropped Out
Independent Living	0=Lives with Parent Figure 1=Lives Independent of Parent
Total Number of Transitions	Continuous (range 0-3)
Control Variables	
Family Structure	0=Lives with Both Biological Parents 1=Does not Live with Both Biological Parents
Attachment to Parents	Continuous
School Commitment	Continuous
Public Assistance	0=No Assistance 1=Assistance Received
African American	0=Hispanic, White, or Other 1=African American

Table 1.2.2: Descriptive Statistics

		<u>Denver</u>	<u>Pittsburgh</u>	<u>Rochester</u>
		(n=296)	(n=506)	(n=729)
Early Delinquency and Substance Use*				
General Delinquency	Mean	2.44	2.29	2.11
	SD	1.73	1.63	1.83
Alcohol and Drug Use	Mean	1.55	1.24	1.16
	SD	1.83	1.39	1.64
Precocious Transitions				
Pregnancy	Mean	.15	.19	.24
	SD	.36	.39	.43
Parenthood	Mean	.05	.10	.14
	SD	.22	.30	.35
Dropout	Mean	.18	.19	.27
	SD	.39	.39	.44
Independent Living	Mean	.10	.04	.09
	SD	.31	.20	.28
Total Number of Transitions				
	Mean	.43	.41	.58
	SD	.73	.70	.83

(Table 1.2.2, continued)

		<u>Denver</u>	<u>Pittsburgh</u>	<u>Rochester</u>
Control Variables				
Family Structure	Mean	.67	.64	.60
	SD	.47	.48	.49
Attachment to Parents	Mean	3.58 ^c	2.56 ^a	2.68 ^a
	SD	.57	.35	.33
School Commitment	Mean	3.68 ^c	2.38 ^b	3.05 ^a
	SD	.50	.33	.38
Public Assistance	Mean	.56	.36	.41
	SD	.50	.48	.49
African American	Mean	.39	.57	.56
	SD	.49	.49	.50

^ascale range = 1-3; ^bscale range = 1-4; ^cscale range = 1-5

*Note: Natural logarithm is used for delinquency indices.

Table 1.2.3: Pearson Correlation Coefficients Between Early Delinquency, Precocious Transitions, and Total Number of Transitions

	<u>Denver</u>	
	<u>General</u>	<u>Alcohol and</u>
	<u>Delinquency</u>	<u>Drug Use</u>
Pregnancy	.24*	.31*
Parenthood	.20*	.25*
Dropout	.21*	.21*
Independent Living	.20*	.21*
Total Number of Transitions	.32*	.35*

	<u>Pittsburgh</u>	
	<u>General</u>	<u>Alcohol and</u>
	<u>Delinquency</u>	<u>Drug Use</u>
Pregnancy	.06	.11*
Parenthood	.02	.05
Dropout	.23*	.23*
Independent Living	.09*	.07
Total Number of Transitions	.19*	.21*

(Table 1.2.3, continued)

Rochester

	<u>General</u> <u>Delinquency</u>	<u>Alcohol and</u> <u>Drug Use</u>
Pregnancy	.39*	.30*
Parenthood	.22*	.19*
Dropout	.33*	.28*
Independent Living	.13*	.24*
Total Number of Transitions	.42*	.39*

*p < .05, one-tailed test.

Table 1.2.4: Logistic and OLS Regression Coefficients Predicting Precocious Transitions and Total Number of Transitions, Denver

	Pregnancy ^a		Parenthood ^a		Dropout ^a		Independent Living ^a		Total # of Transitions	
Early Delinquency and Substance Use										
General Delinquency	.44*		.60*		.32*		.37*		.32*	
	(.108)		(.146)		(.079)		(.091)		(.14)	
Alcohol and Drug Use		.46*		.62*		.26*		.36*		.38*
		(.113)		(.150)		(.065)		(.089)		(.16)
Control Variables										
Family Structure										
Attachment to Parents							-.78*		-.82*	
School Commitment										
Public Assistance		.71*	1.54*	1.85*						
African American			1.24*	1.52*						
Improvement X ²	21.5**	30.3**	21.1**	26.5**	14.1**	13.0**	21.7**	24.7**		
R ²									.13**	
Adjusted R ²									(.10)	.17**
										(.15)

^a Note: Values in parentheses are predicted probabilities.

^bFor the OLS regression the unstandardized coefficient is in parentheses.

*p < .05, one tailed test; ** p < .05.

Table 1.2.5: Logistic and OLS Regression Coefficients Predicting Precocious Transitions and Total Number of Transitions, Rochester

	Pregnancy ^a		Parenthood ^a		Dropout ^a		Independent Living ^a		Total # of Transitions	
Early Delinquency and Substance Use										
General Delinquency	.48* (.118)		.29* (.072)		.40* (.099)		.28* (.070)		.40* (.18)	
Alcohol and Drug Use		.36* (.089)		.25* (.062)		.31* (.077)		.44* (.108)		.36* (.18)
Control Variables										
Family Structure										
Attachment to Parents							-.95*		-.88*	
School Commitment					-.59*					-.09* (-.19)
Public Assistance			.46*	.47*			.93*	.98*	.09* (.14)	.09* (.14)
African American	.77*	1.00*	.74*	.90*	.63*	-.40*	-1.17*	-1.06*		
Improvement X ²	95.9**	68.5**	34.6**	30.2**	74.3**	57.0**	35.5**	49.0**		
R ² Adjusted R ²									.19** (.18)	.17** (.16)

^a Note: Values in parentheses are predicted probabilities.

^b For the OLS regression the unstandardized coefficient is in parentheses.

*p < .05, one tailed test; ** p < .05.

Table 1.2.6: Logistic and OLS Regression Coefficients Predicting Precocious Transitions and Total Number of Transitions, Pittsburgh

	<u>Pregnancy^a</u>		<u>Parenthood^a</u>		<u>Dropout^a</u>		<u>Independent Living^a</u>		<u>Total # of Transitions</u>	
Early Delinquency and Substance Use										
General Delinquency	n.s.		n.s.		.28* (.070)		n.s.		.14* (.06)	
Alcohol and Drug Use		n.s.		n.s.		.33** (.082)		n.s.		.17* (.09)
Control Variables										
Family Structure							1.80*		1.83*	
Attachment to Parents							-1.11			
School Commitment					-.85*					
						-.91*				
Public Assistance	1.37*	1.36*	1.27*	1.22*	1.12*	1.16*			.27* (.38)	.27* (.38)
African American	.63*	.56*								
Improvement X ²	33.0**	35.4**	18.7**	19.6**	39.0**	43.6**	13.8**		12.8**	
R ² Adjusted R ²										.13** (.12) .15** (.13)

^a Note: Values in parentheses are predicted probabilities.

^b For the OLS regression the unstandardized coefficient is in parentheses.

*p < .05, one tailed test; ** p < .05.

2. SITE-SPECIFIC ANALYSES: DENVER YOUTH SURVEY

2.1 THE IMPACT OF ARREST ON SUBSEQUENT DELINQUENT BEHAVIOR

David H. Huizinga, Finn-Aage Esbensen, and Anne Weiher

The impact of arrest on future behavior can be viewed from various theoretical orientations, including labelling theory and the amplification of deviance, deterrence theory, and social learning theory. From these views the impact of arrest can be seen as a deterrent to future delinquency, as an event that has little influence on a juvenile's life, or as an event that facilitates or results in increased levels of delinquent involvement.

From the perspective of labelling theory, the official act of arrest and consequential identification of a juvenile as a "delinquent," actually increases the chance of future delinquency. "The process of making the criminal is a process of tagging, defining, ... it becomes a way of stimulating, suggesting, emphasizing, and evoking the very traits that are complained of. The person becomes the thing he is described as being. Nor does it seem to matter whether the valuation is made by those who would punish or those who would reform ... The harder they work to reform the evil, the greater the evil grows ... The way out is through a refusal to dramatize the evil. The less said about it the better" (Tannenbaum, 1938). A labelling

perspective suggests that the act of sanctioning produces a formal label that serves as a reinforcer for the very behavior that the processing was intended to deter, and further, may limit access to non-delinquent friendships and opportunities. Such restrictions to prosocial resources help push an individual into more antisocial or delinquent associations.

From a specific deterrence perspective, arrest and subsequent processing should act as a warning and punishment, clearly indicating to the arrestee that engaging in delinquent behavior will not be tolerated. From this view, the individual should learn that engaging in delinquent behavior has serious consequences, and it would be anticipated that arrest would decrease the likelihood of future delinquent behavior.

A learning perspective may encompass the above deterrence view, but it also would include the alternative possibility of positive rewards and reinforcement from the status provided. Also, in the context that may follow arrest, an arrestee may find support and encouragement and learn additional delinquent skills by justice system enforced differential association with other officially identified delinquent youth.

These theoretical views are clearly not without political and practical consequences. A labelling perspective may lead to a policy of "non-intervention" for most youth and the development of diversion programs, as occurred in the 1970's. A deterrence perspective may lead to a "get-tough" and lock them up strategy, as experienced in the 1980's and 90's. A learning perspective

may say that neither extreme is correct, but rather the outcome of arrest depends on the individual and the nature of the reinforcements provided by the environment in which the individual lives. In this case, the effect may be quite different for different types of youth, and different individualized treatments are necessary.

In this report, the impact of arrest as seen in the Denver Youth Survey is examined. As a background, the questions of who gets arrested, and for what kind of offenses, are first addressed. The age, sex, race, and delinquent status of arrestees are described. Following this, the impact of a first arrest on subsequent delinquent behavior is examined.

It should be noted that in some ways, this is a preliminary report. Additional work on this topic involving the influence of multiple arrests, the influence at different stages of a delinquent career, and direct influences of arrest on perceived labelling and other psychosocial variables, is continuing within the Denver Youth Survey (DYS). In addition, a major cross-site report of the Program of Research on these issues is planned. Nonetheless, the findings presented are an important first step, and provide some insight into the influence of arrest and JJS processing.

The arrest and delinquency information used in the following analyses is taken from the youth sample of the Denver Youth Survey (DYS). This sample contains 876 individuals who were 11, 13, or 15 years of age in 1987. The data used are taken from the

first five annual waves of the longitudinal survey, so that the youngest youth cohort spans the 11-15 year old age range and the oldest the 15-19 year old age range, and all of the ages 11-19 are represented. The delinquency and arrest data used are both self-reported by the respondents. In Denver, tickets are issued for some more minor delinquent offenses, and these events are included in the arrest counts provided.

Who gets arrested?

The percent of the adolescent sample that has ever been arrested is given in Figure 2.1.1. Slightly over half of the youth respondents report having been arrested at some time in their life. Clearly, arrest is not uncommon among this high risk sample. Because males have higher rates of offending than do females, it is expected, and usually found, that males have higher arrest rates. This is true in this sample. More boys, 64%, than girls, 41%, report having been arrested. However, the high rate of arrest among girls indicates that concern about girls in the juvenile justice system (JJS) is clearly warranted.

The percent of different ethnic groups that report having an arrest some time in their life is given in Figure 2.1.2. As can be seen, there are some relatively small differences in the percentages of different ethnic groups reporting ever being arrested, with African-American, Hispanic, Anglo, and Other ethnic groups in descending order. These differences are not statistically significant, however. It should be carefully

noted, that these are the proportions of each group reporting arrest. A different question involves the proportion of a particular ethnic group contained in the group of arrestees seen by the police. Given the ethnic composition of the sample, which is 8% Anglo, 35% African-American, 48% Hispanic and 9% Other), the percentages of each group that are arrested imply that the group of arrestees consists of 7% Anglos, 37% African-American, 48% Hispanic, and 8% other. Thus it appears, that very roughly the same proportion of each ethnic group is being arrested by the police, but given the ethnic distribution of the sample, which is largely minority, a much higher percentage of arrestees are minorities.

The percent of each age group that is arrested, for the total sample and by sex, is given in Figure 2.1.3. As might be anticipated, very few youth below the age of 10 have an arrest for a delinquent offense. Across the 11 to 18 year old ages, there is a steady increase in the percentage that is arrested with increasing age, and this pattern is observed for both males and females. At the older ages, slightly over one-third of the males are arrested and almost one-fifth of the girls.

Figure 2.1.4 displays the percentage of each age group arrested across different ethnic groups. There is again a general increase in the proportion of each age group that is arrested with increasing age. However, at the older youth ages of 17-18, there is a sizeable decrease in the percentage of Anglos arrested and a smaller decrease for Hispanics. Arrest

rates for African-American and for other ethnicities, on the other hand, continue to increase during this period. Whether this reflects a more long term trend will require information from the later waves of the study, that is now being collected.

In answer to the question who get arrested, the above findings suggest that a large proportion, roughly half, of the youth sample have an arrest at some time in their lives. This suggests that a very sizeable section of the youth population in the high risk neighborhoods are engaging in delinquent behavior with sufficient frequency and seriousness to result in an arrest, and provides reason for concern. More boys than girls are arrested, the proportion of each ethnic group that is arrested is roughly the same, and with increasing age there is an increase in the rate of arrest.

For what kinds of offenses are different types of offenders arrested?

Presumably, youth who are more serious offenders are more likely to come to the attention of the police and to be arrested. However, more serious offenders often are involved and commit more minor offenses than youth involved only in minor offending. Thus, serious offenders may be more likely to be arrested for less serious offenses. This raises a question of how well do arrests indicate the level of seriousness of an individuals delinquent offending pattern?

To examine these issues and the kinds of offenses for which

different kinds of offenders are arrested, an offender typology was created. This typology consisted of four types: (1) Non-offenders; (2) Status offenders; (3) Minor offenders; and (4) Serious offenders. Non-offenders are those who report committing no delinquent offenses. Status offenders are those who report committing only status offenses (runaway, truancy, curfew violations). Minor offenders are those who report committing only minor offenses including public disorder (public drunkenness, begging, obscene phone calls, etc.), minor property offenses (property damage, theft under 50\$, joyriding, etc.), or minor assaults (fights or hitting or throwing objects with injury, etc.). Serious offenders are those committing serious offenses (arson, burglary, theft over \$50, auto theft, aggravated assault, rape, robbery, etc.).

In order to examine delinquent behavior and arrest in a common time period, individuals were classified into the typology for the year 1989, when the respondents were 13, 15, and 17 years old, and a cross-classification of type of offender by the most serious arrest in that year was created. This cross-classification is presented in table 2.1.1. One of the most striking observations that occurs upon examination of this table is that regardless of offender type, the majority of that type are not arrested. Not surprisingly, non-offenders are not arrested. Only 12 and 16% of status and minor offenders, respectively, are arrested. These offenders are very likely to "get away" with their delinquent behavior. Roughly one third of

the serious offenders are arrested, so that with increasing seriousness of delinquent behavior there is an increasing probability of arrest. Still, however, only a minority of these individuals are arrested.

Examining the nature of the most serious arrest in the year of offending, suggests that arrest offense may not be a particularly good indicator of offending behavior. Although the relationship between seriousness of offender type and seriousness of the most serious arrest is statistically significant at the .01 level ($\text{ChiSq.}=17.8, 6 \text{ df.}$), serious offenders are more likely to be arrested for a status or a minor offense than for a serious offense. The delinquent behavior of individuals does not appear to be well described by their arrests. This is not a particularly unusual observation, it provides the major impetus to the development and use of self-report measures in the study of delinquency and crime. It is nevertheless a point that needs to be remembered.

It is also interesting to examine the arrests of gang members, and this is given in a separate line of the table. There were 32 active gang members in the youth sample in 1989. As can be seen, 39% of these had no arrest in 1989, 15% were arrested for a status offense, 15% were arrested for a minor offense, and 31% were arrested for a serious arrest. Being a member of a gang substantially influences the probability of arrest, with about two-thirds of the gang members having an arrest and about one-third having an arrest for a serious

offense. This is clearly a different pattern from the non-gang youth.

Arrests and serious violent offending

Of some special concern are serious violent offenders (SVO's). These individuals were identified in the sample by using the follow-up information to self-reported delinquencies collected by the DYS. SVO's were defined to be those individuals involved in serious violent offenses in which relatively serious injury was inflicted (cut/bleeding, unconscious, hospitalized). There are 308 such individuals identified in the DYS over the five years being examined. Of these, 74% had an arrest at some time in the five year period. More specifically, 26% had no arrest, 53% were arrested for a nonviolent offense, 15% were arrested for a minor violent offense, and 6% arrested for a serious violent offense. As with other offenders, arrest is not a very good marker of offense behavior.

Because a majority of these individuals are known to the JJS, it is interesting to compare their age of first arrest with their age of initiation of serious violent offending. Of the SVO's, 26% were never arrested, 28% been arrested before committing a serious violent offense, 23% had their first arrest in the same year as their first serious violent offense, and 24% were arrested after initiating their serious violent offending. Thus, among those arrested, over two-thirds were arrested before or at the same time as they initiated serious violent offending.

This suggests that if these offenders could be identified and effective JJS practices were available, a substantial reduction in serious violent offending would be possible.

What is the effect of a first arrest on future delinquent behavior?

To examine the effect of an arrest on future delinquent behavior, the influence of the first arrest on individual arrestees was examined. To do this, each arrestee was matched with a similar control individual from the DYS sample who was not arrested in the same year as the arrestee and who had no previous arrest history. In this precision match, the arrestee and the control were required to have identical age, sex, ethnicity, and live in the same social area. They were also required to have similar attitudes or beliefs about the wrongness of delinquent behavior, to have the same level of delinquent friends, and to have the same prior delinquent pattern across years. These latter matches were accomplished by using a weighted euclidean distance, so that the control selected to match a particular arrestee was the individual in the sample who had the smallest distance from, and therefore was the most similar to, the arrestee among all other individuals in the sample. Weights were used to increase the importance of more seriousness delinquent behavior in the distance function, with serious offending receiving the largest weight.

To examine the effect of the first arrest , the arrestees

and their matched controls were compared on their level of involvement in status offenses, minor offenses, and serious offenses, as described above, in the year after the arrest. These comparisons can be made from table 2.1.2. Regardless of type of delinquency examined, in the year after arrest the delinquency of the majority of arrestees is either the same as their matched controls or the arrestee is more delinquent than the control. Arrest and subsequent JJS processing apparently have had little effect or has made matters worse for the vast majority of youth who were arrested.

A caveat needs to be observed about the above statement. The use of matched pairs is analytically a step above using the arrestees as their own controls in the analysis, but it is at best a quasi-experimental design. Perhaps the arrestees are on some special trajectory different from the controls, a trajectory not captured by the matching process. In this case, the effect of an arrest may have decreased the offending level of an arrestee from that which it might have been without the arrest. While this is a necessary observation, it should also be observed that whether in comparison with a control, or (in data not presented) in comparison with their own previous behavior, arrest did not decrease the level of subsequent offending of the majority of youth who were arrested.

Summary

Being arrested is not an uncommon experience. Roughly half

Table 2.1.2: Comparison of arrestees and matched control in the year following the arrestees first arrest

		<u>Status</u>	<u>Minor</u>	<u>Serious</u>
		<u>Offenses</u>	<u>Offenses</u>	<u>Offenses</u>
Arrestee delinquency	N	58	99	150
same as control	%	25	43	65
Arrestee more delinquent	N	110	102	62
than control	%	48	44	27
Arrestee less delinquent	N	62	29	18
than control	%	27	13	8

Table 2.1.1: Arrests among different types of offenders in one year: 1990 (adolescent sample ages 13, 15 ,17)

Type of offender		none	<u>Most serious arrest</u>		
			status offense	minor offense	serious offense
Non-offender	(172)	.00	.00	.00	.00
Status offender	(216)	.88	.08	.04	.00
Minor offender	(276)	.84	.07	.08	.01
Serious offender	(213)	.68	.09	.15	.08

of the youth in the high risk sample of the DYS have been arrested. More boys than girls are arrested, but over 40% of the girls are arrested at some time in their teen years. There is ample reason for concern about both sexes in the juvenile justice system. The proportion of each age group arrested increases with age and approximately equal proportions of different ethnic groups are arrested.

Regardless of seriousness of offending pattern, the probability of arrest is quite small, with only about only one-third of serious offenders having an arrest in a year in which they are active, and about 15% of status and minor offenders being so arrested. Gang members have a much higher chance of being arrested, and almost two-thirds of these youth were arrested the year examined.

Although few serious violent offenders were arrested for a serious violent offense, about three quarters of these offenders do have an arrest record. About half of them were arrested before or at the same time as their first serious violent offense. The opportunity for successful juvenile justice system intervention in reducing serious violent offending seems clear, provided these offenders can be identified and if effective programs are in place.

Finally, it was observed that for about three-fourths of the first time arrestees, their delinquent behavior in the following year was no different or was at a higher level than the delinquent behavior of a matched control. This observation does

not lend itself well to a deterrence perspective and provides some support for a labelling or amplification of deviance perspective. However, since some arrestees were more delinquent, some less delinquent, and some the same as their matched controls, it may be that no one perspective is monolithically correct. The impact of arrest may depend on the particular circumstances of different kinds of youth.

Finally, as noted earlier, this is a preliminary report. Many additional important questions remain to be examined. For example, what is the effect of arrest at various stages of a delinquent or violent career? The effect may be different for those at the beginning, middle, or end of a career and may effect either the length or seriousness (or both) of the career. What is the effect of multiple arrests? Do multiple arrests have a stronger influence on subsequent behavior? What is the effect of different dispositions on future behavior? Are some dispositions more efficacious in preventing future delinquency? What is the effect of an arrest as a juvenile on later life chances? Does it have either a positive or negative effect on the relative success of individuals as young adults? These and related questions will be addressed using combined data from all three sites of the Program of Research in future reports.

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Figure 2.1.1
Percent Ever Arrested Among
Youth Sample

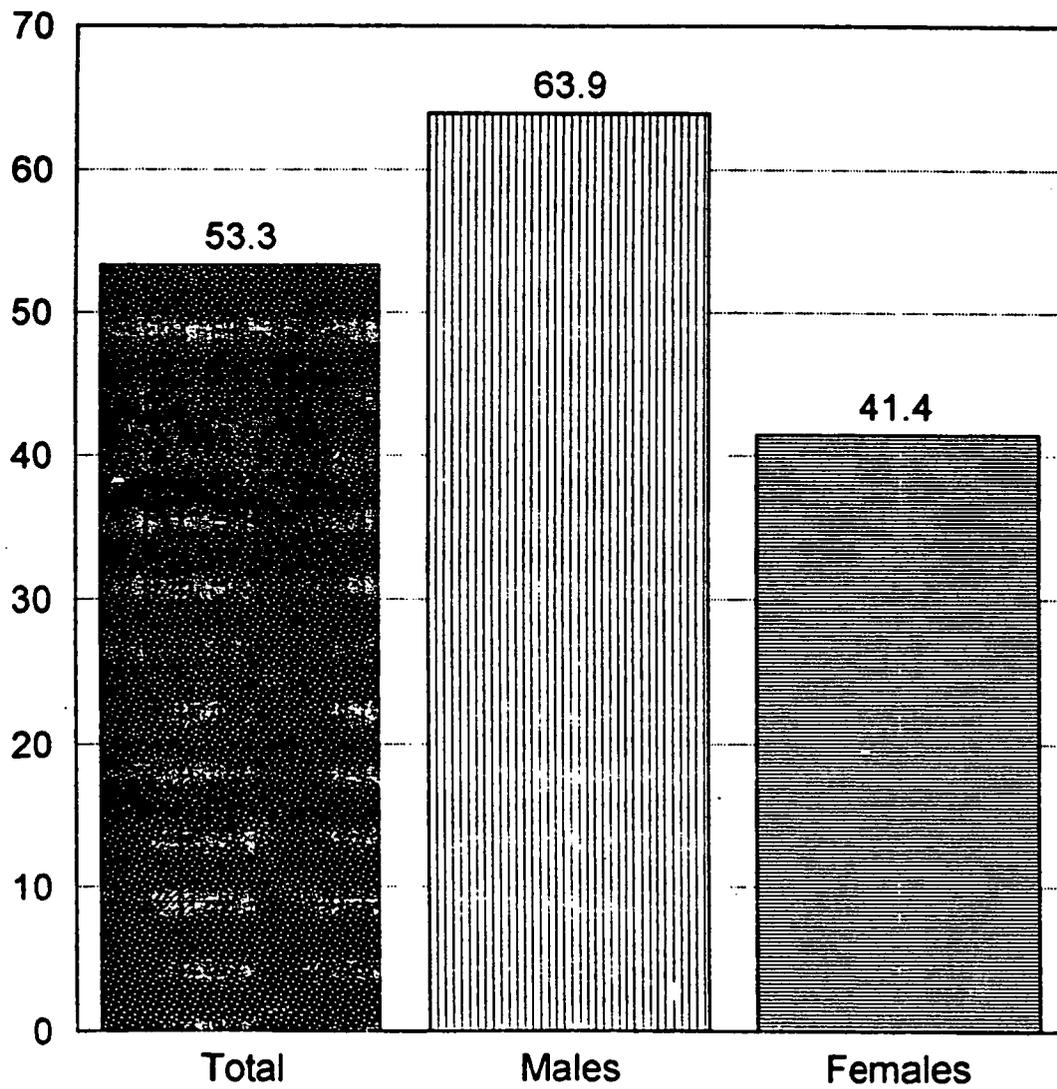


Figure 2.1.2
Percent Ever Arrested by Ethnicity
Among Youth Sample

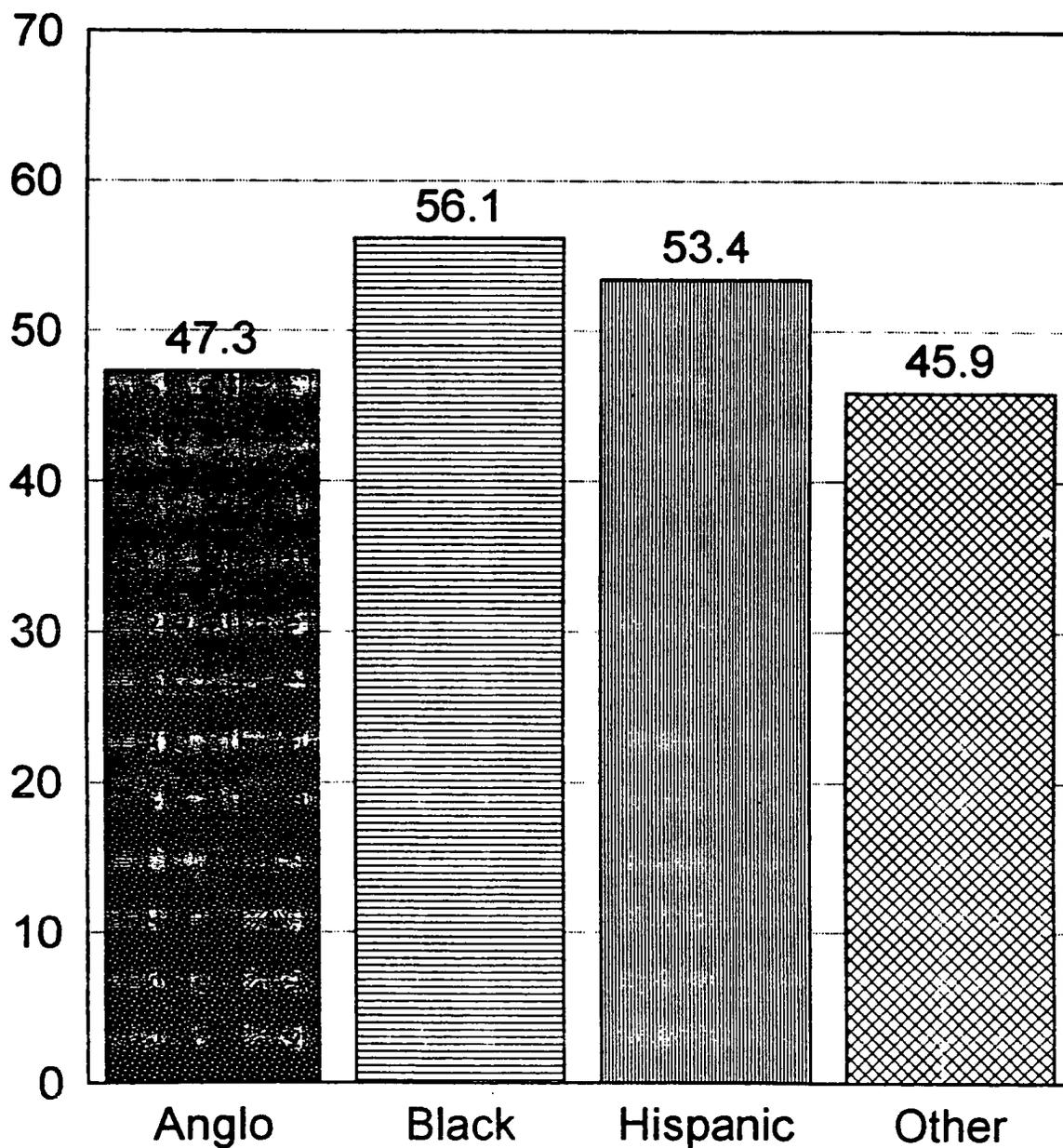


Figure 2.1.3
Age of Arrest by Sex

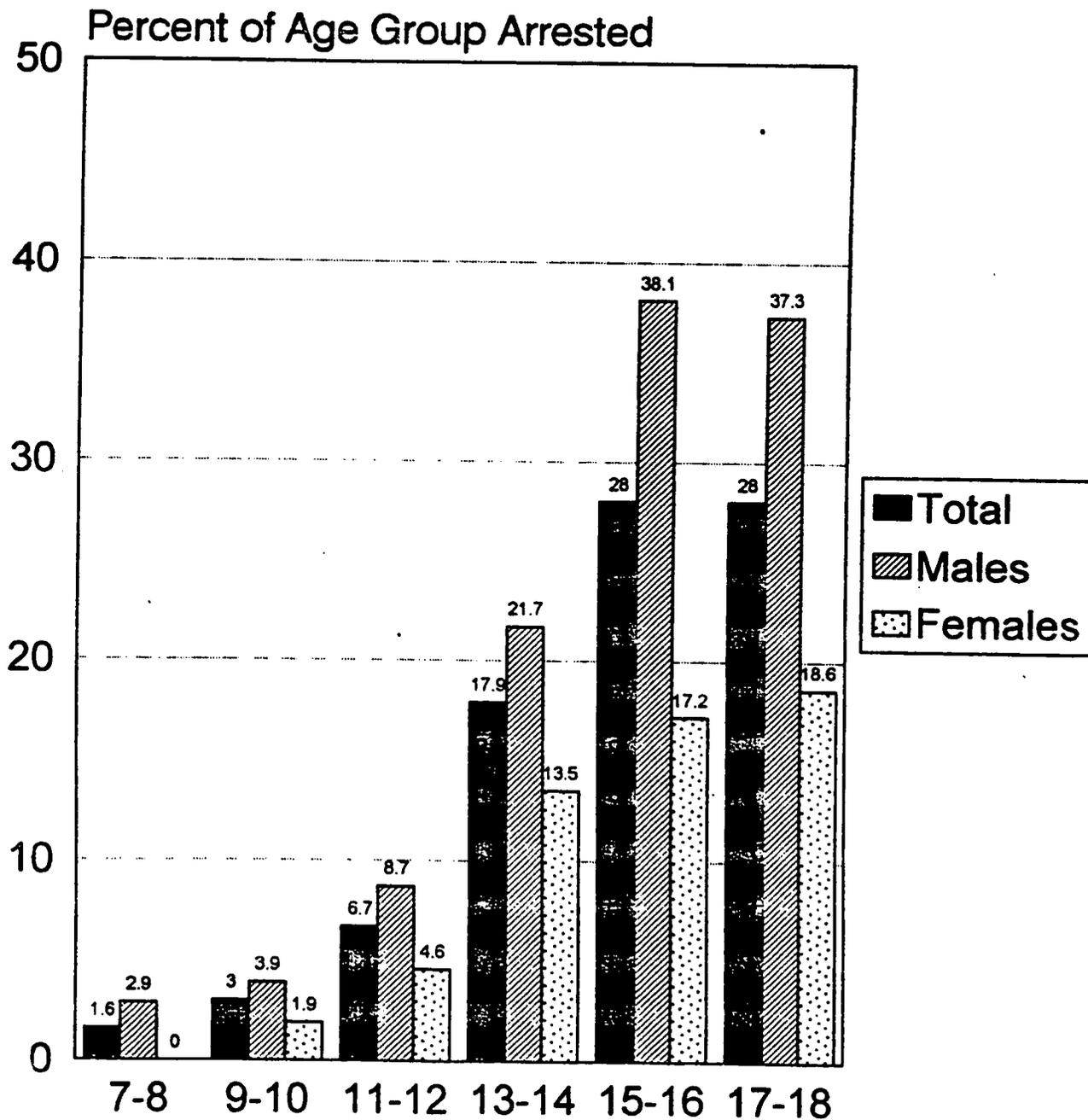
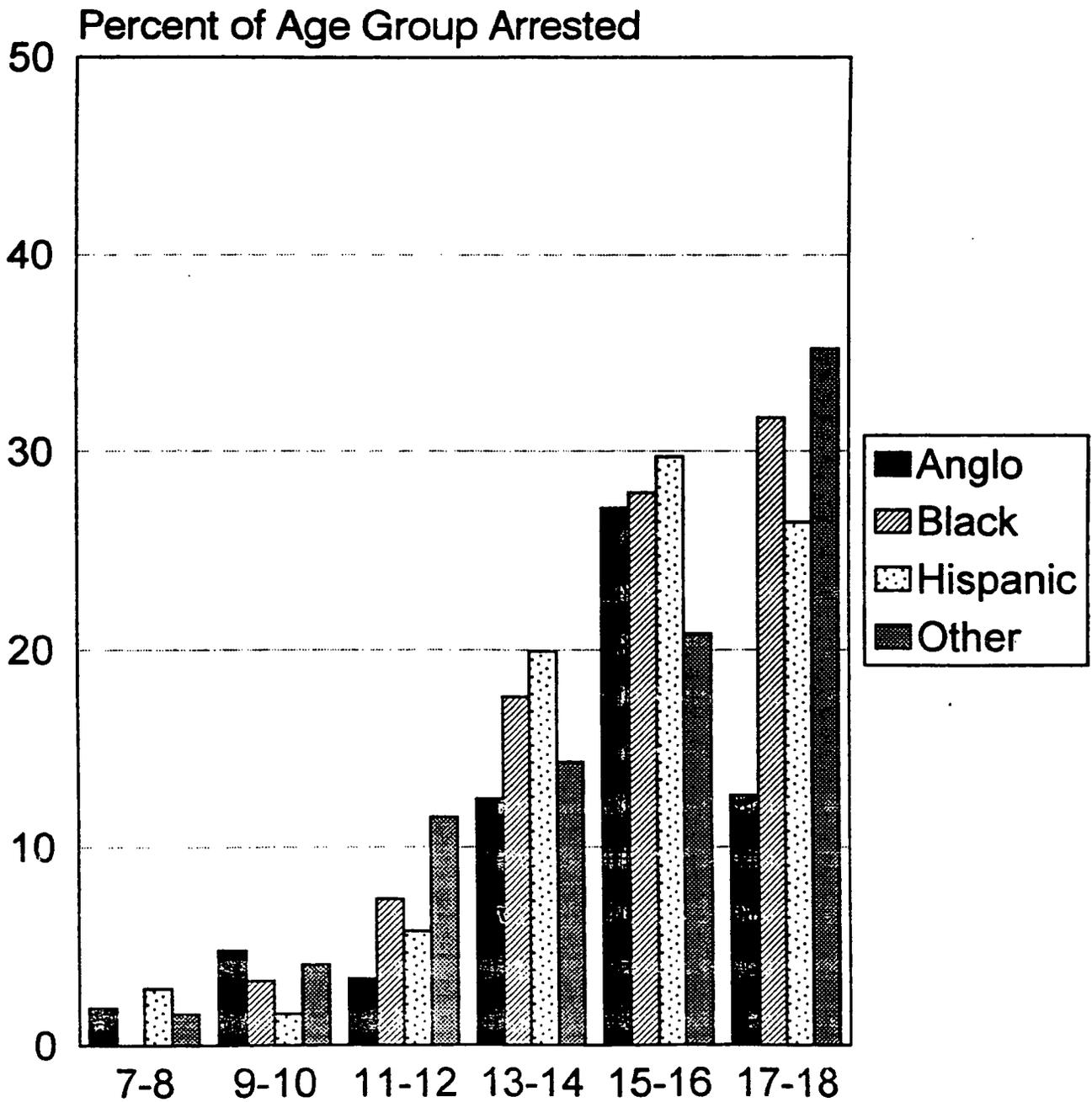


Figure 2.1.4
Age of Arrest by Ethnicity



2.2 AGE AND THE IMPACT OF FAMILY, SCHOOL AND FRIENDS ON SELECTED FORMS OF ILLEGAL BEHAVIOR

Scott Menard

The relationship between age and crime has been extensively studied (for a review, see Farrington 1986). The typical pattern is an increase in illegal behavior into mid-adolescence, followed by a decline as individuals move out of adolescence into adult roles. For some offenses, the peak in offending occurs earlier or later. For example, Elliott et al. (1989) found that serious offending had the earliest peak, followed by other non-drug offenses, but substance use did not peak until the early twenties. Predictors of illegal behavior do not always follow this same pattern. Some, like exposure to delinquent friends, do have a similar pattern, but others, like belief that it is wrong to violate the law, show a fairly monotonic increasing or decreasing trend from early adolescence to early adulthood (Menard 1992). There is also relatively little research on how the impact of different risk factors on illegal behavior changes with age. Life cycle perspectives on illegal behavior have become increasingly popular (see for example Hawkins 1996), and some research has been done testing the effects at different ages of predictors from control theory (Menard et al. 1993) and anomie theory (Menard, 1995b), but systematic investigation of the effects of different risk factors at different ages is more the

exception than the rule.

Here we examine the impact of selected predictors from the family, school, and peer group contexts on selected forms of illegal behavior for respondents aged 8 to 19. The data are taken from the Denver Youth Survey. The offenses examined all reflect behaviors that are illegal regardless of age, and which represent three major categories of illegal behavior. *Injury* offenses represent assaults that resulted in some injury (cut or bleeding, knocked unconscious, required hospitalization) to the victim. These are based on follow-up questions to questions about assaults. Because different questions were used as screens for injury offenses, depending on whether the respondent was a child (under age 11) or a youth or young adult (age 11 to 19), we use annual prevalence of the offense (whether the respondent committed the offense within the past year) as the outcome variable. This allows us to use an identical criterion (the amount of harm inflicted) for both children and youths, and avoids the use of an artificially truncated count of offenses. *Theft* offenses include purse snatching, avoiding payment, taking something from a store (shoplifting), and burglary (taking something from a building or vehicle). *Marijuana use* refers to the most common form of illicit drug use. Both theft and marijuana use are measured as annual frequencies (how many times in the past year). These offenses were selected based on availability for both child and youth respondents, and to capture three different types of offenses (violent, property theft,

substance use) of interest to scholars and policy makers.

From the family context, we selected *parental monitoring*, a measure of the extent to which parents are aware of their children's activities and the extent to which they have rules such as curfew restricting those activities; *parental attachment*, a measure of the emotional ties a respondent feels for her or his parents; and *family structure*, scored in the direction of increasing family disintegration, with a low score representing an intact two-parent family (or possibly in a few cases, a youth respondent who was married), a high score representing a single parent family, and an intermediate score representing all other possible combinations. There are numerous other possibilities for classifying family structures, but these are not explored in detail here. From the school context, we used two measures: most recent *grade point average*, scored on a five point scale (1=F, 5=A), and frequency of *school problems*, a combination of cheating on school tests, truancy, and being suspended or expelled from school. Grade point average has been shown to be one of the better school context predictors of marijuana use and other forms of illegal behavior (Menard et al. 1993). The school problems measure is itself a measure of problem behavior and includes one form of delinquency (truancy), but involves behavior which does not constitute grounds for arresting an adult, and which has the potential to be useful in identifying children and adolescents at risk of more serious problem behavior. From the peer group context, we used *exposure to delinquent friends*, one

of the most commonly used and best supported predictors of illegal behavior in past research (Elliott et al. 1989) and *susceptibility to negative influences of friends*, a scale based on respondent reports of how likely they would be to go along with their friends if their friends were getting into trouble at home, at school, or with the police.

These specific measures were selected both for availability from both child and adolescent respondents, and because they include predictors in each context (parental monitoring, grade point average, exposure to delinquent friends) that have proven to be among the best predictors in those contexts in past empirical studies of illegal behavior. These measures are not exhaustive either of the specific contexts being examined here, or of the broader set of possible predictors of or risk factors for illegal behavior. In particular, attitudinal measures which may not be specific to any context, such as belief that it is wrong to violate the law, and attitudinal and behavioral measures specific to other contexts, such as employment, occupational aspirations, and perceived chances of occupational success, have not been used here. Also, only direct effects are measured here; indirect effects are not tested. The results are therefore more illustrative than conclusive when they indicate that a particular risk factor is useful for predicting illegal behavior, since their effect may be diminished in the presence of other risk factors. To the extent that they indicate that a particular risk factor is not a good predictor of illegal behavior, the results

may either indicate that variable is not important, or that its effects are indirect rather than direct (for example, parental monitoring may affect illegal behavior primarily by keeping adolescents out of highly delinquent peer groups).

For all of the analyses, the data from the first five years of the DYS were pooled into a single data file, in which each respondent was potentially represented by as many as five records corresponding to five different years of the survey and five different ages for the respondent. (For a description of the use of pooled time series/cross-sectional data, see Sayrs 1989.) The data were analyzed first by examining trends over age in both the illegal behavior outcome variables and in the risk factors or predictors. Next, the predictors were used to predict the outcome variables, and their collective utility for prediction was assessed, using ordinary least squares (OLS) regression for frequency of theft and marijuana use and, since it is a dichotomous variable, logistic regression analysis for prevalence of injury offenses. (For a discussion of OLS and logistic regression and their differences, see Menard 1995a.) For overall predictive utility, the R^2 statistic for OLS regression and the R_L^2 statistic for logistic regression were used. Finally, the effects of the separate predictors were examined using the statistical significance of the OLS and logistic regression coefficients, and the standardized OLS and logistic regression coefficients, as indicators of the relative importance of each of the predictors.

Figure 2.2.1 shows the age variations in the prevalence of injury offenses and the frequency of theft and marijuana use. Table 2.2.1 presents these same data in numeric form. Injury offenses show the characteristic pattern of increasing up to ages 14 or 15, then declining, although the prevalence increases again at age 19. (Other research using these data indicate that this pattern is somewhat different for boys and girls, but in the present analysis the full sample is used.) Theft offenses increase from the preteen years into adolescence, but show no sign of leveling off by age 19; instead, their increase appears to continue into early adulthood. Marijuana use shows the most pronounced increase from ages 8 and 9, when there is no reported marijuana use (this is consistent with previous results for a national sample; see Elliott et al. 1989) to age 18, when it approaches a mean frequency of 20 times per year. The decline from age 18 to age 19 may represent a real change in the trend, or merely a single year fluctuation in the trend.

Risk factors, shown in Figure 2.2.2 and Table 2.2.2, appear to have little trend over the life course. The two exceptions to this generalization are school problems, which increase up to age 16 and then decline, and parental attachment. The pattern for school problems, a form of problem behavior, are real and consistent with the expected pattern. The apparent pattern for parental attachment really reflects a change in the scaling of the attachment questions from the form used for respondents under age 11 (3 response categories) and for respondents 11 and older

(5 response categories). This apparent change, then, just reflects a change in measurement and should be ignored. Parental monitoring and non-intact family structure increase, then decrease, but the changes are small. Grade point average declines slightly, and exposure to delinquent friends and susceptibility to negative influences of friends both increase from the preteen to the young adult ages. Note that the variables in Figure 2.2.2 are measured on different scales, most of them social psychological scales with no absolute metric. This means that while differences in trends for different variables (and the trends themselves for each separate variable) are meaningful, differences in scores between two different variables are not really meaningful, and only reflect the different scales chosen for the different variables.

Figure 2.2.3 indicates how well we are able to explain the variation in the three illegal behaviors at each age. Explanatory power, as indicated by the R^2 coefficient for ordinary least squares regression and the R_L^2 coefficient for logistic regression, varies between zero and one, with larger values indicating better explanatory power. For all three offenses, the two patterns evident in Figure 2.2.3 are a year-to-year fluctuation, most likely indicative of random sampling variation, and a general upward trend. Taking three-age averages, explanatory power increases from .08 for ages 8-10 to .18 for ages 17-19 for injury offenses; from .06 for ages 8-10 to .10 for ages 17-19 for theft offenses; and from .04 for ages 8-10

to .12 for ages 17-19 for marijuana use. This general increase in predictive power with age is consistent with results from previous studies of control and anomie theories cited above. By comparison with previous studies, particularly studies using a national probability sample, these levels of explained variance are low. This may be attributable to the nature of the DYS sample, which focuses on high-risk respondents, and includes a high percentage of minority respondents. One issue raised by these levels of explained variance is whether the predictors of illegal behavior work as well for racial and ethnic minorities respondents as they do for racial and ethnic majority group members. This issue is not pursued in detail here, but will be examined in more detail in future research.

Figures and Tables 2.2.4, 2.2.5, and 2.2.6, show the effects of individual predictors on the three offense outcomes. The numbers graphed are standardized regression coefficients or *beta* coefficients, which are useful for showing the relative strength of predictors measured on different scales. The importance of a predictor is indicated by the extent to which it is different from zero in either the negative (associated with reduced illegal behavior) or positive (associated with increased illegal behavior) direction. In all three figures, it is evident that the strongest and most consistent predictor of illegal behavior is exposure to delinquent friends (EXPDELFF), whose relationship with the outcome variables increases with age. As expected, the more illegal behavior one's friends are involved in, the more one

is involved in illegal behavior oneself.

For injury offenses, low grade point averages or GPA (as indicated by the negative relationship, below zero in the graph) and high levels of school problems (SCHPROB) and susceptibility to negative influences of friends (NEGINFF) are also associated with higher rates of illegal behavior at least at some ages (mainly ages 10-12 for school problems, 15 and 16 for GPA, and inconsistently for susceptibility to negative influences). None of the effects of the three family variables is statistically significant at the .10 level or better. Although this indicates that family variables have no direct effect on injury offenses, it does not mean that they have no effect; as noted earlier, their effects may be indirect.

A similar pattern is evident for marijuana use, as indicated in Figure 2.2.6. Susceptibility to negative influences of friends, school problems, and GPA all have some effect, primarily for ages 11 to 16. GPA actually appears to have a positive influence on marijuana use at age 19; this effect is marginally significant ($P = .075$), weak ($\beta = .117$), and, speculatively, may reflect higher rates of marijuana use among college students than among their non-college age mates. For ages 14, 16, and 17 it also appears that parental attachment is associated with lower rates of marijuana use. All three coefficients are marginally significant (greater than .05 but less than .10), negative, and weak (about $-.09$ in magnitude). Neither family monitoring nor family structure has any direct effect.

For theft, the picture (literally) is less clear. Exposure to delinquent friends remains the best predictor overall, especially at the later ages, but the relationship is not as consistent as for injury offenses or marijuana use. School problems appear to be as consistently but not as strongly associated with higher rates of theft. Each of the other variables is statistically significant for at least one age, but there is no coherent pattern.

Overall, these results tend to reinforce findings from previous studies. In summary:

- The single most important predictor of illegal behavior is the extent to which one's friends are involved in illegal behavior, a finding common in previous research.
- The second most consistent predictor of illegal behavior is itself a form of problem behavior, school problems, a finding which reinforces previous research indicating a positive relationship among different types of problem behavior.
- The direct relationship of other variables to illegal behavior tends to be weak and inconsistent, but these other variables may have an indirect relationship, via exposure to delinquent friends or school problems, to illegal behavior.

For family variables in particular, the number of statistically significant coefficients at the .050 level is 5, and at the .100 level it is 10; out of 102 total coefficients, this is exactly what we would expect by chance if there were really no direct

relationship between the family variables and the outcomes. For the other four predictors, the number of statistically significant coefficients exceeds what would be expected by chance alone. Our ability to explain illegal behavior increases with age, suggesting that illegal behavior at younger ages may be more experimental and illegal behavior at older ages may be more patterned.

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TABLE 2.2.1: AGE-SPECIFIC MEANS FOR ILLEGAL BEHAVIOR (See also Figure 1)

Age	Injury offense rate (Prevalence)	Theft offense rate (frequency)	Marijuana use rate (frequency)
8	.04	.28	.00
9	.06	.51	.00
10	.06	.29	.01
11	.04	.24	.19
12	.05	.58	.16
13	.08	1.96	2.10
14	.13	1.96	4.42
15	.12	1.67	11.83
16	.11	1.03	14.40
17	.11	1.29	14.78
18	.09	1.58	18.93
19	.14	5.41	14.88

TABLE 2.2.2: AGE SPECIFIC MEANS FOR FAMILY, SCHOOL, AND PEER GROUP PREDICTORS

Age	Parental Monitoring (PARMON)	Parental Attachment (PARNATT)	Family Structure (FAMSTR)	Most Recent Grade Point Average (GPA)	School Problems (SCHPROB)	Exposure to Delinquent Friends (EXPDELF)	Susceptibility to Negative Influences of Friends (NEGINFF)
8	17.92	15.68	1.94	4.26	.48	12.45	4.21
9	18.37	16.07	1.95	4.27	.15	11.90	3.85
10	18.74	16.36	1.99	4.23	.80	11.99	4.14
11	19.39	25.67	2.03	4.08	.32	12.01	4.32
12	19.44	33.39	2.05	3.90	1.12	14.01	5.32
13	19.85	33.65	2.08	3.67	1.77	14.04	5.53
14	19.55	32.75	2.08	3.62	4.12	15.02	6.00
15	19.39	32.50	2.14	3.49	7.59	15.50	5.87
16	19.45	32.48	2.16	3.46	10.61	15.64	6.06
17	19.32	32.91	2.09	3.48	9.41	15.28	5.91
18	18.58	32.95	2.05	3.59	7.44	15.50	5.93
19	17.54	32.69	1.99	3.60	5.39	15.15	6.27

TECHNICAL NOTES

1. All predictors are measured for the year prior to the illegal behavior they predict; the actual age for which the variables were measured is one less than the age in column 1, but the ages to which the variables predict are listed in column 1 for consistency with Table 1.

2. The scale for parental attachment changes substantially between ages 11 and 12 as listed in the table. For ages 9-11, the number of response categories is only 2 (disagree or agree); for ages 12-20, it is 5 (from strongly disagree to strongly agree). Similarly, the scales for exposure to delinquent peers and negative influence change from three category to five category response sets from ages 9-11 to ages 12-20.

TABLE 2.2.3: EXPLANATORY POWER OF PREDICTORS FOR ILLEGAL BEHAVIOR OUTCOMES

Age	Injury offenses: logistic R^2	Injury offenses: OLS R^2	Theft offenses: OLS R^2	Marijuana use: OLS R^2
8	.07	.04	.09	NA
9	.04	.01	.04	NA
10	.14	.12	.06	.04
11	.06	.01	.02	.01
12	.07	.07	.03	.06
13	.11	.07	.08	.09
14	.09	.08	.06	.07
15	.16	.16	.07	.12
16	.08	.06	.06	.09
17	.10	.08	.07	.09
18	.26	.25	.08	.11
19	.18	.17	.14	.16

TECHNICAL NOTES

1. Reliabilities for parental monitoring, parental attachment, and susceptibility to negative influences are lower for ages 9-11 than for later ages; although this may slightly attenuate the correlations at these earlier ages, the same is not true for family structure, grade point average, school problems, or at a significant level for exposure to delinquent friends. Also note that the explanatory power of the models is about the same for ages 9-11 as for ages 12-14.

2. For injury offenses, it is possible to calculate the OLS R^2 , which is arguably best for comparing across models for different offenses (since both theft and marijuana use models rely on the OLS R^2 as the measure for accuracy of prediction), but the logistic R^2 is more appropriate for comparing the explanatory power of the logistic regression model for injury offenses across ages (Menard 1995a).

TABLE 2.2.4: DIRECT AGE-SPECIFIC INFLUENCES OF PREDICTORS OF INJURY OFFENSES

Age	Parental Monitoring (PARMON)	Parental Attachment (PARNATT)	Family Structure (FAMSTR)	Most Recent Grade Point Average (GPA)	School Problems (SCHPROB)	Exposure to Delinquent Friends (EXPDELF)	Susceptibility to Negative Influences of Friends (NEGINFF)
8	-.057 (.480)	-.023 (.768)	.047 (.532)	-.019 (.789)	.105 (.053)	.051 (.460)	-.176 (.101)
9	.003 (.587)	-.008 (.256)	-.000 (.990)	.001 (.850)	-.120 (.777)	.009 (.097)	-.000 (.956)
10	.095 (.232)	.065 (.404)	-.016 (.828)	-.120 (.057)	.169 (.004)	.165 (.014)	.150 (.017)
11	-.024 (.582)	.018 (.681)	-.049 (.272)	.016 (.702)	.046 (.030)	.064 (.027)	-.066 (.237)
12	.098 (.362)	-.036 (.732)	-.032 (.747)	.035 (.729)	.199 (.001)	.160 (.047)	-.082 (.429)
13	.041 (.546)	-.001 (.985)	.024 (.694)	-.071 (.217)	.031 (.478)	.167 (.001)	.111 (.034)
14	-.022 (.709)	-.098 (.103)	.033 (.545)	-.030 (.571)	-.004 (.937)	.230 (.000)	.022 (.682)
15	.025 (.714)	-.009 (.898)	.034 (.596)	-.108 (.075)	.127 (.011)	.212 (.002)	.152 (.009)
16	-.056 (.329)	.091 (.115)	.004 (.945)	-.131 (.012)	-.027 (.578)	.149 (.002)	.049 (.323)
17	-.083 (.174)	.087 (.169)	.080 (.187)	-.037 (.528)	-.014 (.783)	.227 (.000)	-.004 (.946)
18	-.120 (.326)	.020 (.869)	-.082 (.457)	-.078 (.467)	-.089 (.445)	.474 (.000)	-.108 (.338)
19	-.046 (.667)	-.082 (.423)	-.072 (.451)	.039 (.653)	.047 (.589)	.385 (.000)	-.025 (.790)

TECHNICAL NOTES

1. Coefficients are standardized logistic regression coefficients, computed as described in Menard (1995a). Figures in parentheses are statistical significance levels of the logistic regression coefficients.

2. Reliabilities vary considerably both between some variables as measured for ages 9-11 as opposed to ages 12-20 (parental monitoring, parental attachment, and susceptibility to negative influences of friends all have lower reliabilities for the earlier ages) and across variables.

3. The screening questions for injury offenses were different for ages 9-11 (hit teachers or grownups at school, hit parents, hit siblings, hit other kids, thrown things at people) and ages 12-20 (attacked someone with a weapon, hit someone to hurt them, robbed someone, thrown things at people, gang fighting, and rape or attempted rape).

TABLE 2.2.5: DIRECT AGE-SPECIFIC INFLUENCES OF PREDICTORS OF THEFT OFFENSES

Age	Parental Monitoring (PARMON)	Parental Attachment (PARNATT)	Family Structure (FAMSTR)	Most Recent Grade Point Average (GPA)	School Problems (SCHPROB)	Exposure to Delinquent Friends (EXPDELF)	Susceptibility to Negative Influences of Friends (NEGINFF)
8	-.051 (.405)	-.001 (.984)	-.037 (.528)	-.056 (.351)	.095 (.109)	.265 (.000)	.040 (.494)
9	.133 (.034)	-.132 (.041)	-.052 (.393)	.013 (.827)	-.042 (.490)	-.012 (.852)	.102 (.096)
10	-.085 (.055)	-.013 (.757)	-.011 (.787)	-.101 (.016)	.185 (.000)	.032 (.466)	-.029 (.490)
11	-.057 (.193)	.006 (.898)	.052 (.220)	.037 (.382)	.116 (.007)	.038 (.368)	.007 (.869)
12	.001 (.989)	-.007 (.890)	.077 (.071)	-.035 (.427)	.066 (.138)	.120 (.008)	-.002 (.970)
13	.016 (.729)	-.111 (.025)	.060 (.160)	-.063 (.147)	.164 (.000)	.056 (.245)	.013 (.773)
14	.030 (.525)	.013 (.789)	-.008 (.847)	-.014 (.741)	-.006 (.898)	.222 (.000)	.064 (.163)
15	-.072 (.141)	-.038 (.447)	.096 (.023)	-.043 (.322)	.088 (.045)	.095 (.045)	.072 (.110)
16	.024 (.633)	-.067 (.185)	.140 (.001)	-.002 (.963)	.100 (.043)	.068 (.194)	.064 (.183)
17	-.051 (.312)	-.047 (.356)	.045 (.324)	.030 (.527)	.018 (.703)	.225 (.000)	.015 (.764)
18	-.000 (.996)	-.028 (.722)	.060 (.379)	.016 (.817)	.134 (.059)	.203 (.010)	.008 (.910)
19	-.046 (.545)	-.050 (.500)	-.006 (.930)	.097 (.146)	-.013 (.840)	.309 (.000)	.096 (.168)

TECHNICAL NOTES

1. Coefficients are standardized OLS regression coefficients. Figures in parentheses are the statistical significance levels of the OLS regression coefficients.
2. The theft items used for both ages 9-11 and 12-20 were practically identical.

TABLE 2.2.6: DIRECT AGE-SPECIFIC INFLUENCES OF PREDICTORS OF MARIJUANA USE

Age	Parental Monitoring (PARMON)	Parental Attachment (PARNATT)	Family Structure (FAMSTR)	Most Recent Grade Point Average (GPA)	School Problems (SCHPROB)	Exposure to Delinquent Friends (EXPDELF)	Susceptibility to Negative Influences of Friends (NEGINFF)
8	NA	NA	NA	NA	NA	NA	NA
9	NA	NA	NA	NA	NA	NA	NA
10	.045 (.311)	.055 (.215)	.060 (.156)	-.017 (.687)	-.023 (.593)	.182 (.000)	-.038 (.375)
11	-.012 (.781)	-.022 (.615)	.055 (.195)	-.069 (.106)	-.021 (.618)	.045 (.290)	.023 (.588)
12	.023 (.609)	-.067 (.143)	.023 (.594)	.010 (.826)	.209 (.000)	.081 (.069)	-.026 (.562)
13	.051 (.284)	-.041 (.400)	.052 (.219)	-.088 (.042)	.133 (.003)	.122 (.012)	.083 (.064)
14	.027 (.561)	-.091 (.061)	-.027 (.522)	-.001 (.985)	.009 (.839)	.163 (.001)	.091 (.046)
15	-.044 (.354)	.050 (.309)	.050 (.229)	-.134 (.002)	.163 (.000)	.128 (.006)	.088 (.047)
16	.079 (.108)	-.092 (.065)	.030 (.494)	-.042 (.355)	.127 (.010)	.153 (.003)	.036 (.443)
17	.049 (.334)	-.087 (.084)	.011 (.800)	.038 (.411)	.022 (.636)	.268 (.000)	.050 (.301)
18	-.000 (.997)	.043 (.579)	.006 (.933)	.081 (.233)	.054 (.439)	.248 (.001)	.169 (.017)
19	-.025 (.736)	-.101 (.890)	-.010 (.875)	.117 (.075)	.010 (.879)	.337 (.000)	.103 (.131)

TECHNICAL NOTES

1. Coefficients are standardized OLS regression coefficients. Figures in parentheses are the statistical significance levels of the OLS regression coefficients.
2. Marijuana use was a single item; there was no self-reported marijuana use by respondents under age 11.

AGE-SPECIFIC OFFENDING RATES

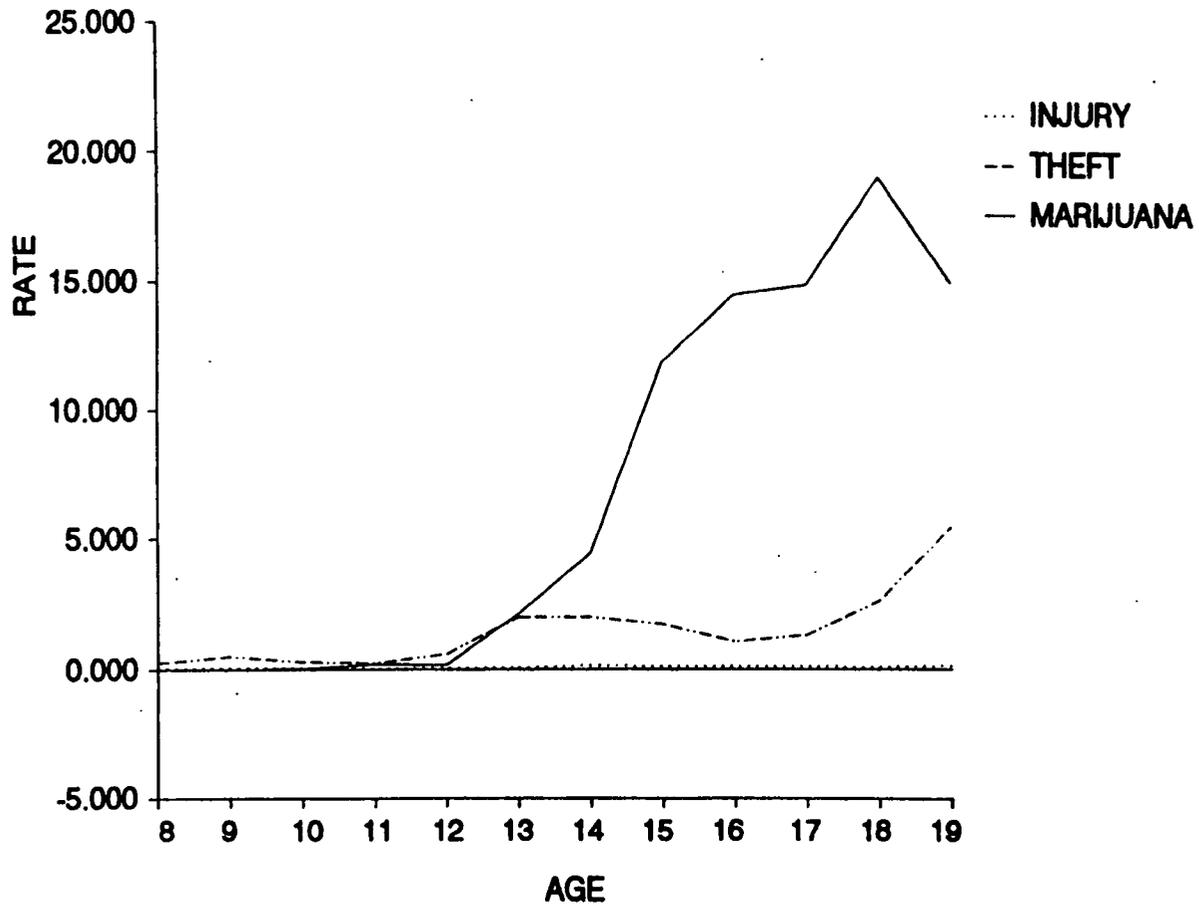


FIGURE 2.2.1

RISK FACTORS BY AGE

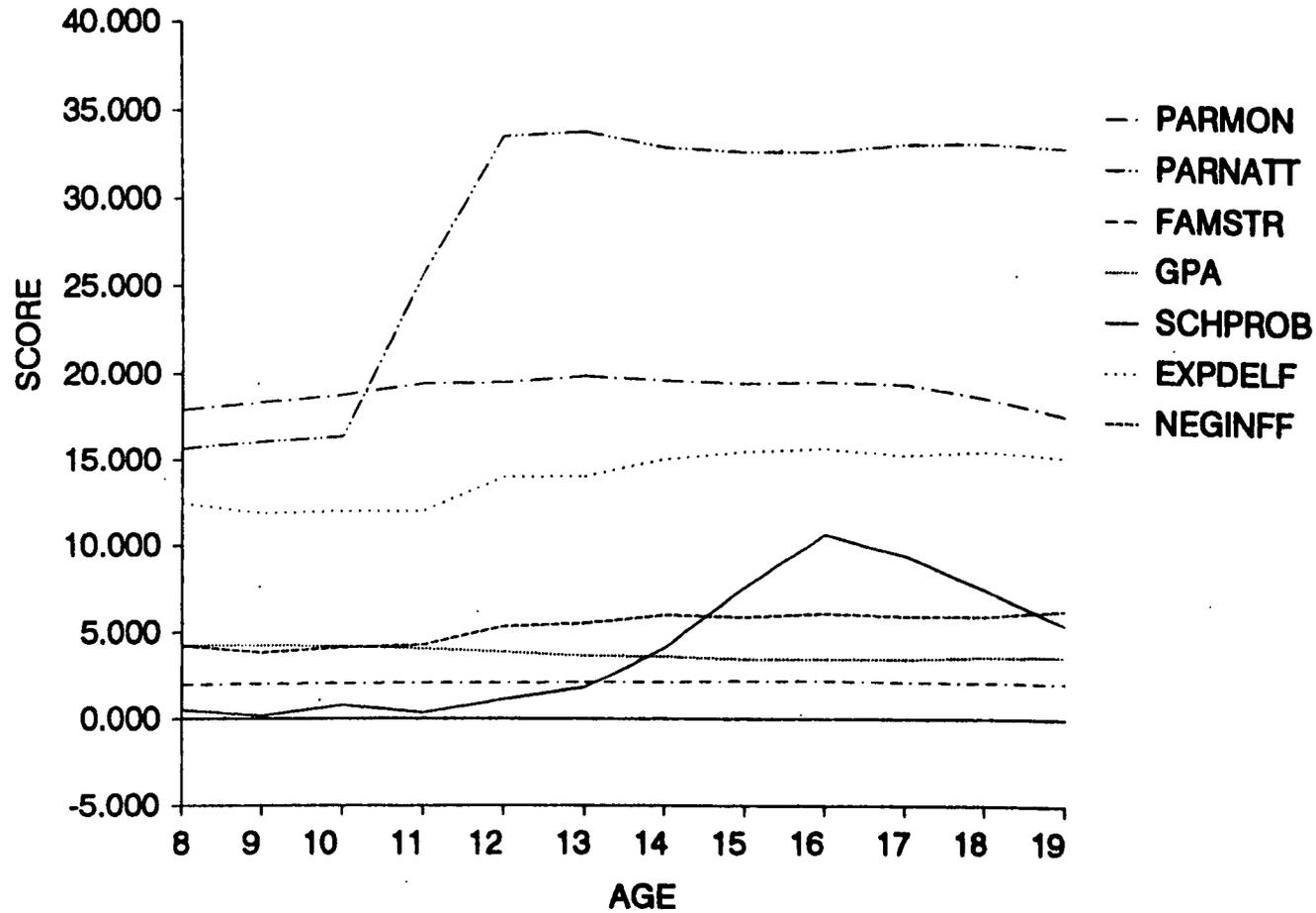


FIGURE 2.2.2

EXPLANATORY POWER BY AGE

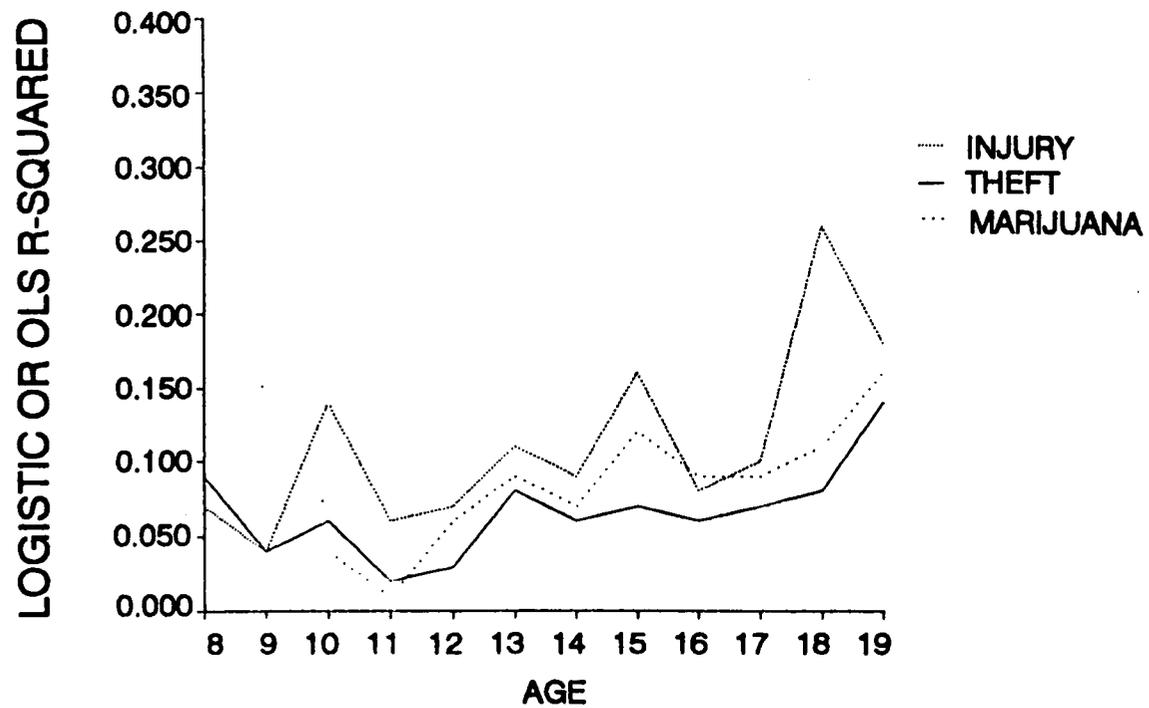


FIGURE 2.2.3

INJURY OFFENSES

INFLUENCES BY AGE

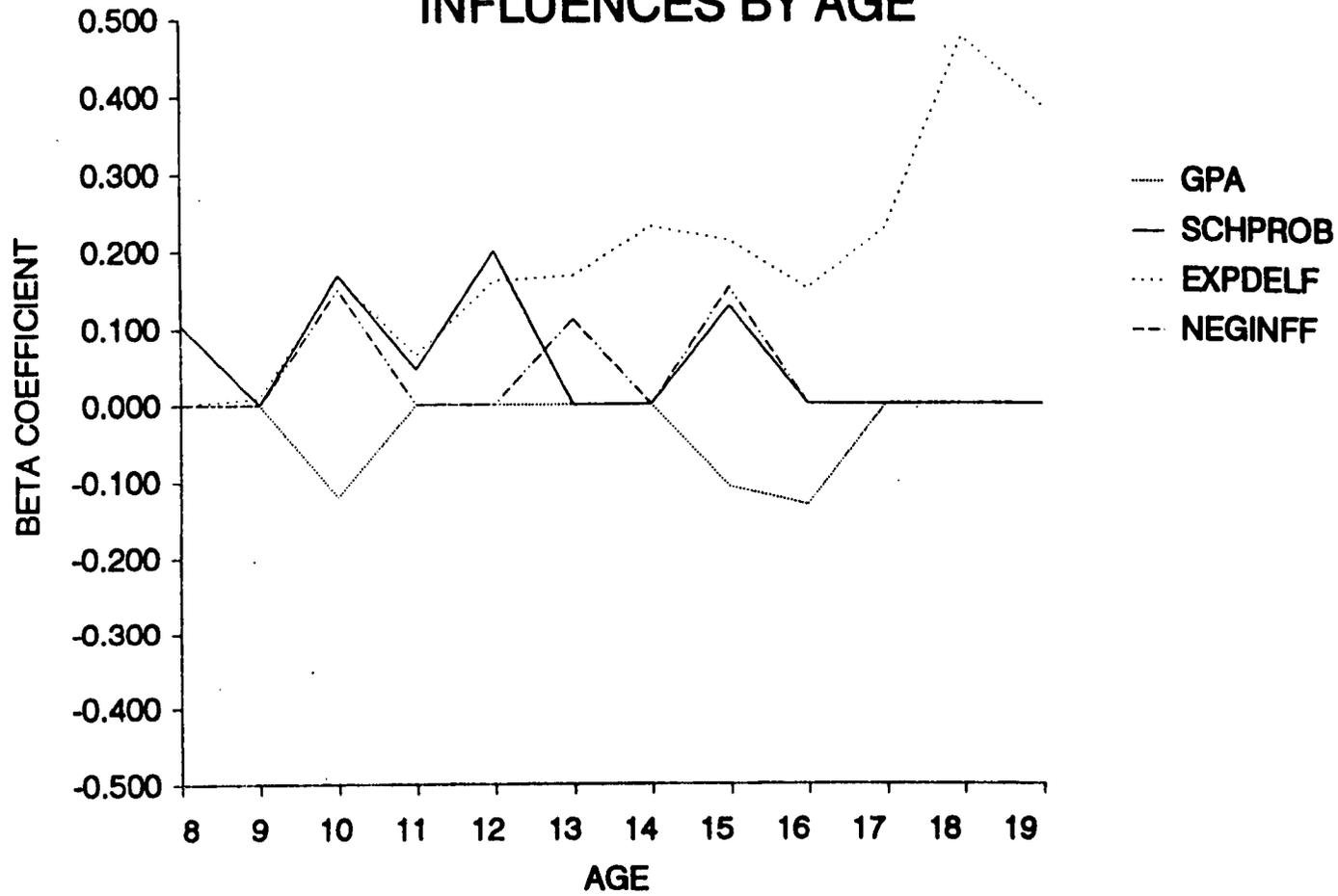


FIGURE 2.2.4

THEFT OFFENSES

INFLUENCES BY AGE

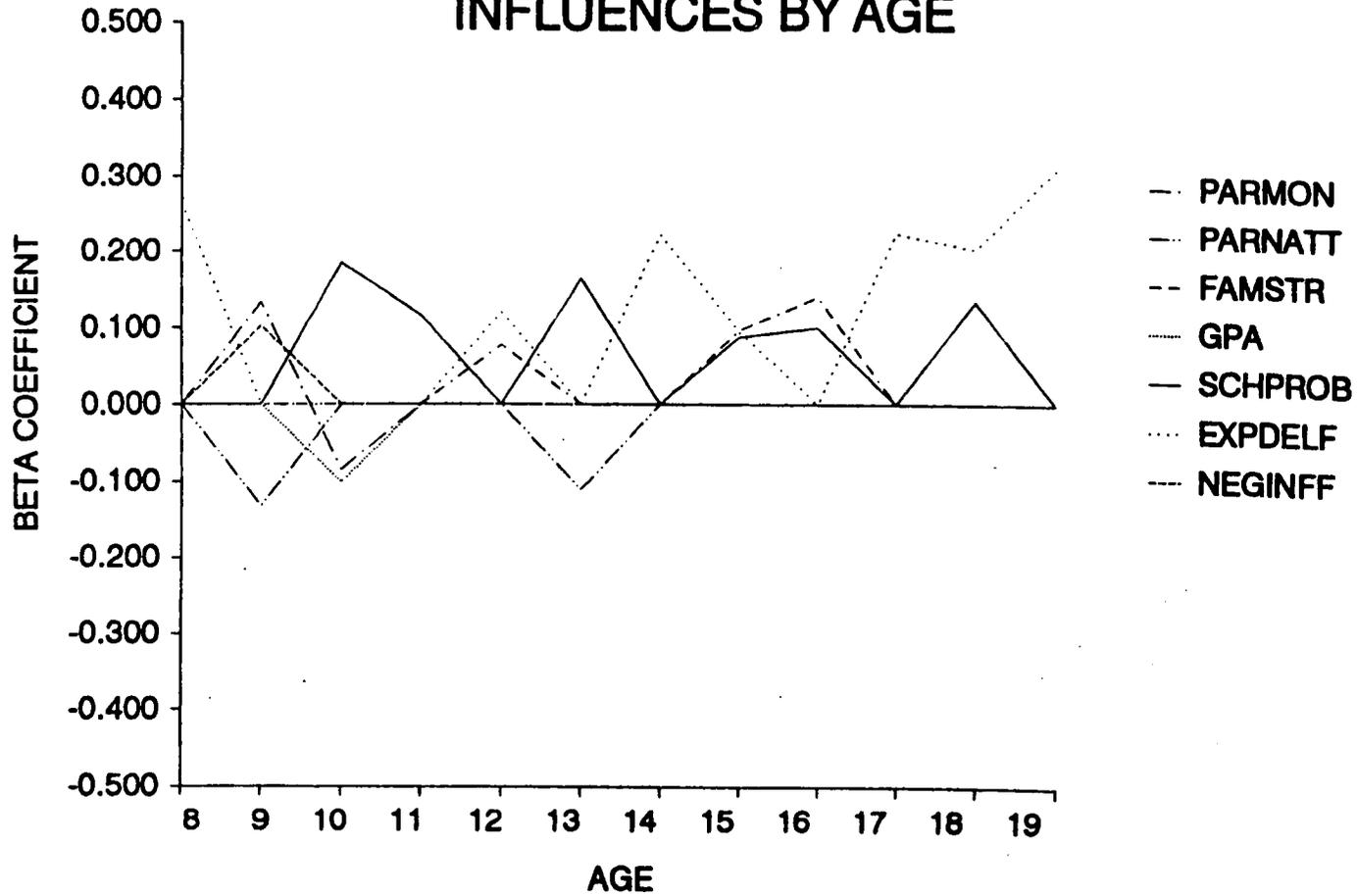


FIGURE 2.2.5

MARIJUANA USE

INFLUENCES BY AGE

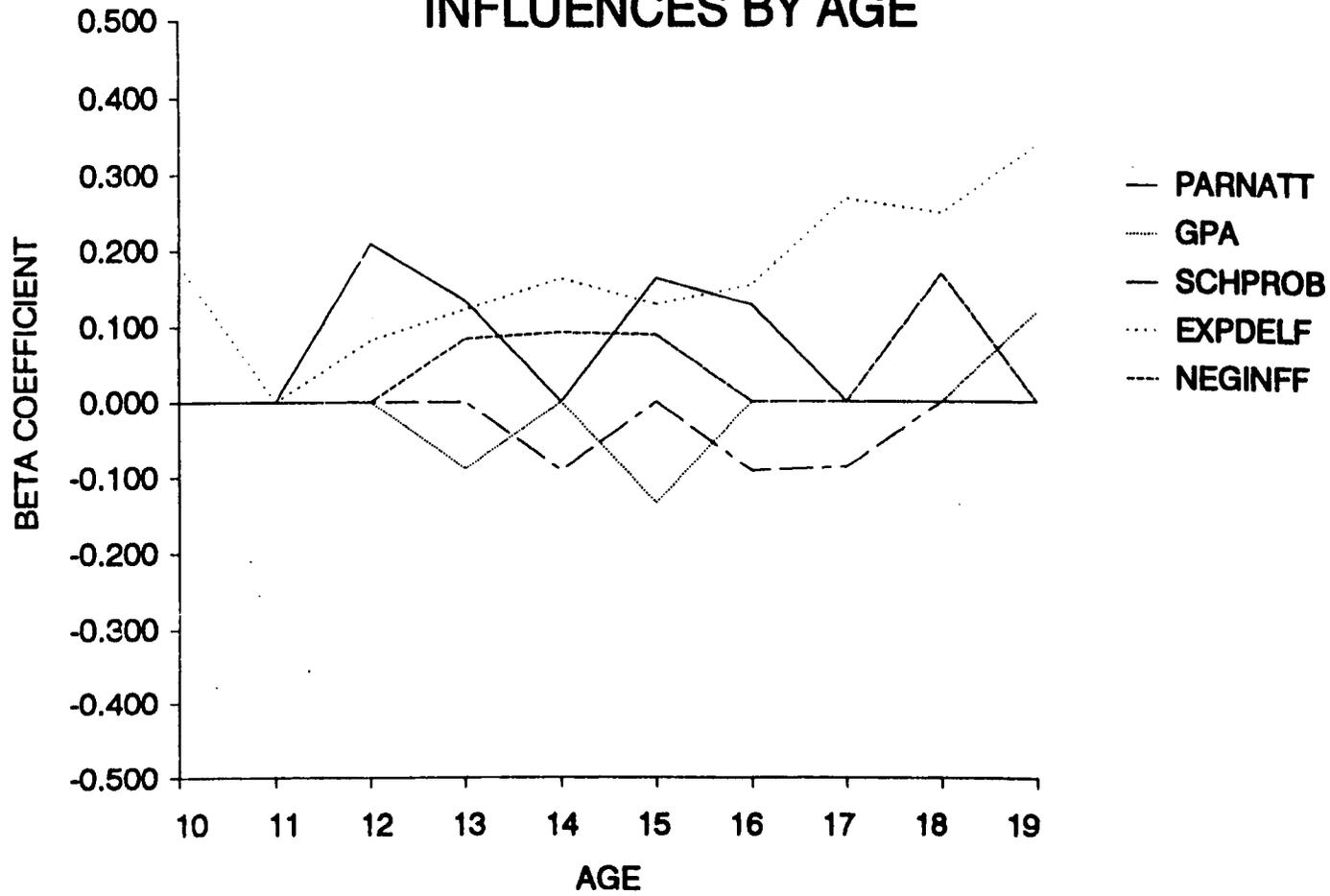


FIGURE 2.2.6

2.3 PRECIPITATING FACTORS FOR AND OUTCOMES OF TEEN PREGNANCY

Anne Weiher

Throughout the 1970's and 1980's, America underwent significant social and economic changes. Many of these changes had far reaching consequences. Among these was the sharp rise in adolescent pregnancy and childbearing. Both of these phenomena reached epidemic proportions (Furstenberg, Jr., Lincoln, & Menchen, 1981 and Turner, Grindstaff & Phillips, 1980). Over one million adolescents between the ages of 15 and 19 become pregnant each year, a number which has remained almost stable since 1973 (Henshaw, Kenney, Somberg, and Van Wort, 1989; Carreña & Dempsey, 1988). Most of these pregnancies occur to unmarried teenagers (Moore, 1995). Hence, the phenomenon of teenage pregnancy has tremendous consequences for society at large.

Previous work has examined the relationship between sexual activity, pregnancy, delinquency, and drug use (Costa, Donovan, & Jessor, 1992; Robinson & Frank, 1994; Weiher, Huizinga, Lizotte, and van Kammen, 1991). While this work and that of others (Donovan & Jessor, 1985; Elliott, Huizinga, & Menard, 1989; Elliott & Morse, 1989; Jessor & Jessor, 1978; Johnston, O'Malley & Eveland, 1978) has established a correlation between different types of deviant behavior during adolescence, especially the relationships between delinquency, drug use, early sexual activity, and its correlate teenage pregnancy, it has not been

extended to the psychological and social correlates of teenage pregnancy. Furthermore, little work has been done on the immediate outcomes and consequences of teenage pregnancy.

To date, the research which has focused on the psychosocial correlates of teenage pregnancy has come from diverse disciplines. Some research has indicated that being poor and African American is a major risk factor for adolescent pregnancy (Zelnick and Kantner, 1978). Other literature from developmental psychology has suggested that a poor relationship between the teenager and her mother, immaturity, inability to plan for the future, low self-esteem, loneliness, and impulsiveness are characteristic of adolescents who become pregnant (Group for Advancement of Psychiatry (GAP), 1986; Cobliner, 1974; Hart & Hilton, 1988; Hatcher, 1973; Hepfer, 1988; Kissman, 1990; Schaffer & Pine, 1972)

However, much of this research is inconclusive and some is contradictory. For example, some researchers (Dilorio & Riley, 1988; McCullough & Scherman, 1991; and Meyer, 1991) have found that many of the relationships postulated above, especially low self-esteem and loneliness have no relationship to teenage pregnancy. Evidence from epidemiological studies (Furstenberg, et al., 1981) suggests that the incidence of teenage pregnancy among white Americans is increasing while that of African Americans is either decreasing or remaining constant.

Although Furstenberg et al. (1981) have explored the long-term consequences of teenage pregnancy, little work has been done

on the short term consequences and even less of that work has been done within the context of a high risk, general population sample. Thus, the focus of this paper is two fold: one, to examine psychological, social, and behavioral precursors to teenage pregnancy; and two, to examine psychological, social, and behavioral outcomes of teenage pregnancy. Using longitudinal data from the first five waves of the Denver Youth Survey (DYS), the complex nature of these relationships will be studied.

Method

Female respondents in the Denver Youth Survey (DYS) who ranged in age from 11 through 19 during the time of data collection were asked in annual interviews whether or not they had been pregnant in a given year as well as a variety of demographic, psychological, attitudinal, and behavioral questions. For purposes of these analyses, variables used were limited to specific psychological, behavioral and social variables described below. Additionally, at the fourth and fifth wave of data collection, those females who had experienced a pregnancy were asked specific questions about drug use during pregnancy (including tobacco, alcohol, marijuana, and hard drugs). They were also asked about changes in lifestyle, self-perception, financial status, support systems, and school status as a result of their teenage pregnancy.

Specific domains of variables which were considered in these analyses included the demographic variables of ethnicity and

family structure. Psychosocial variables included parental attachment, social isolation, impulsivity and self-esteem. Other variables of particular interest to this study included both peer conventional and deviant behavior, positive and negative commitment to peers, and attitudes toward both delinquency and conventional values (see Appendix 2.3 for sample items). Two different typologies were constructed to measure involvement in delinquent activities and drug use. The delinquency typology consisted of four types: those who had never been involved in any type of delinquent behavior, those who had been involved in only minor forms of delinquency (e.g., status offenses, hitchhiking, been loud or unruly), those who had been involved in other serious delinquency (e.g., stole goods worth less than \$50, joyriding, minor assault, arson, fraud), and those involved in street crimes (e.g., stole goods worth more than \$50, robbery, serious assault, rape, sold drugs, been involved in gang fights). A similar typology was created for alcohol and drug use. This typology consisted of three types: those who had never used alcohol or drugs, those who had used alcohol only, and those who had used marijuana or other drugs (e.g., heroin, crack, cocaine, hallucinogens, angel dust, tranquilizers).

In order to truly look for precursors to teenage pregnancy, the longitudinal study allows correct temporal order to be maintained. Demographic, attitudinal, behavioral, and psychological variables were all measured in the year preceding the pregnancy. Hence, there are four different time periods for

analysis. Since questions about pregnancy are initiated at age 11, the first two time periods include the oldest three cohorts in the study. The third time period includes the four oldest cohorts and the fourth time period includes all five cohorts. Hence the age span is from 11 to 19 years of age, with cross cohort comparisons at Time 3 and Time 4.

Demographic information

The distribution of the DYS sample is 10% Anglo, 35% African American, 45% Hispanic, and 10% other. With the exception of Time 4, the percentages of those who were pregnant generally matches this distribution. At time 4, 3% of those who were pregnant were Anglos, 44% were African Americans, 43% were Hispanic and 11% were mixed racial groups. This difference was statistically significant ($X^2=9.42$, $p=.02$) with slightly fewer Anglos and more African Americans than expected being pregnant.

For the first three years of data collection, family structure was divided into only two categories: those who lived with their biological families (both parents) and those who lived with non-biological families (single parents, biological parent and step-parents, other relatives, group homes, or foster homes). For time 1, there were no significant differences between the teens who were pregnant versus those who were not in terms of whether or not they lived in one family situation or another. However, at times 2 and 3, the differences became significant with more pregnant teens than expected by chance living with non-

biological families ($X^2=6.00$, $p=.01$ for Time 2 and $X^2=7.84$, $p=.005$). The difference at time 4 was even more pronounced when it was possible to divide teens into four different types of living arrangements: those living with biological families, those with non-biological, those who were married or cohabitating, and those who were living on their own ($X^2=62.59$, $p<.000$). In contrast to previous years, those who were pregnant, were less likely than their non-pregnant peers to be living with single parents or in step families. They were still less likely to be living with their biological parents than were their non-pregnant peers. Twenty-nine percent of the pregnant teens were either married, cohabitating or emancipated while only six percent of their non-pregnant peers were in those living situations (see Table 2.3.1).

Table 2.3.2 shows the breakdown by age of those teens who were pregnant. As might be expected, all of these differences are statistically significant below the .000 level. In general, the number of teens who are pregnant increases with age.

Results

For all attitudinal continuous variables, the predictor variables were divided at the median into two groups: one scoring above the median on a given scale and the other scoring below the median. A Chi-square analysis was conducted for all time periods and for all of the variables in order to determine the relationship between these variables and teen-age pregnancy.

Attitudinal Variables. The analysis across all four times periods examined indicated little or no relationship between positive and negative peer commitment, parental attachment, self esteem, and attitudes toward conventional values and teenage pregnancy. However, two attitudinal variables were predictive across two time periods and three more were predictive across three time periods.

Peer involvement in delinquent behavior while not significant at time 1 or time 3, was significant at time 2, $X^2=9.17$, $p=.002$ and at time 4, $X^2=6.27$, $p=.01$. At time 2, 61% of the pregnant teens indicated that their friends had a high level of involvement in delinquent activities while only 41% of non-pregnant teens so indicated. At time 4, similar results held with 56% of the pregnant teens reporting that their friends were involved in delinquent activities while only 42% of the non-pregnant teens reported such involvement.

The measure of peer conventional behavior indicated that pregnant teens were more likely to have friends who rejected societal norms than were their non-pregnant counterparts. Chi-squared analysis indicated significant results at time 1 ($X^2=6.41$, $p=.01$), time 3 ($X^2=4.99$, $p=.03$), and time 4 ($X^2=10.65$, $p=.001$). At time 1, 73% of pregnant teens scored below the median on this measure while only 52% of non-pregnant teens scored in the lower half of the distribution. At time 3, 68% of those who were pregnant were below the median compared to 51% of their non-pregnant counterparts. Similar results held at time 4,

with 66% of pregnant teens scoring below the median compared to 52% of non-pregnant teens.

While impulsivity was not significant at time 1 or time 2, it was a significant predictor of teenage pregnancy at time 3 ($X^2=4.85$, $p=.03$) and time 4 ($X^2=3.83$, $p=.05$). At time 3, 64% of pregnant teens were above the median on measures of impulsivity, while only 47% of non-pregnant teens were above the median. At time 4, 48% of the pregnant teens scored higher than the median on impulsivity, while 38% of their non-pregnant peers were higher than the median.

Isolation showed a stronger pattern than did impulsivity, with results not attaining significance at time 1, but doing so at time 2 ($X^2=4.85$, $p=.03$), time 3 ($X^2=4.14$, $p=.04$) and time 4 ($X^2=8.02$, $p=.004$). At time 2, 53% of teens who were pregnant scored above the median on isolation, while only 38% of non-pregnant teens did. At time 3, 56% of pregnant teens were above the median, while 40% of their non-pregnant counterparts were. Finally at time 4, 54% of the pregnant teens scored high on isolation, while only 39% of their non-pregnant peers were above the median.

At time 4, all of the psychological variables were significant predictors of teenage pregnancy with the exception of self esteem and peer negative commitment to conventional values. Only 32% of pregnant teens showed high parental attachment, while 43% of non-pregnant teens reported high values ($X^2=4.37$, $p=.04$). Twenty-five percent of pregnant teens reported that their peers

had a positive influence on their prosocial behavior, while 42% of non pregnant teens reported such beliefs ($X^2=9.20$, $p=.002$). Thirty-three percent of pregnant teens held attitudes toward conventional values as opposed to 50% of their non-pregnant peers ($X^2=8.87$, $p=.003$). Seventy-two percent of pregnant teens indicated a greater tolerance for delinquent behavior while only 56% of their non-pregnant peers did ($X^2=9.12$, $p=.003$). Finally, 72% of the pregnant teens thought deviant behavior was acceptable while only 56% of their non-pregnant peers held such beliefs ($X^2=9.12$, $p=.003$).

Behavioral Variables. Using the typology described above, individuals were placed into one of four delinquency categories and one of three drug categories. Results of Chi-square analysis were consistent across all four waves with significant differences reported for pregnant versus non-pregnant teens using both typologies. The only exception to this was for Time 4, when a larger number of older teens were pregnant. There was no significant relationship between delinquency types and pregnancy. Tables 2.3.3 and 2.3.4 summarize the findings for delinquency and drug use.

Outcome Measures. Pregnant teens were asked specific questions regarding tobacco, drug and alcohol use during pregnancy and questions about changes in life events, family dynamics, and self-perception as a result of becoming pregnant. These questions were only asked at Time 3 and 4, so only findings from these years are reported. Table 2.3.5 reports findings from

the drug and alcohol usage at times 3 and 4, while Table 2.3.6, summarizes findings from the life events, family dynamics, and self-perception changes measures for these same time periods.

Discussion

Some of these results serve to confirm results of other studies: that there is little direct relationship between psychological factors and teenage pregnancy. Yet, others of the results are unexpected. Little relationship was found across time between ethnicity and pregnancy. This is a high risk sample of youths, in some sense, the vast majority of them are from lower socioeconomic groups. Perhaps, the finding that there is little relationship between ethnicity and whether or not a teenager gets pregnant may refute commonly held ideas that it is African American teenagers who are getting pregnant. This fact may hold, not as much due to their ethnicity, but rather due to their socioeconomic status. Within this rather homogenous socioeconomic sample, the results obtained by other researchers regarding the relationship between ethnicity and pregnancy do not seem to hold.

Some might argue that the breakdown of the family is responsible for the fact that teens who live with both biological parents have lower rates of pregnancy than those who do not. However, this finding may also be an artifact of socioeconomic status; that is, those teens who are living in intact families are more likely to be living in more economically prosperous

situations. The problem is also confounded by the fact, that at Time 4, when more extensive definitions of living arrangements are available, the pattern reverses. The significant relationship at Time 4 seems due to the fact that many more of the pregnant teens than expected are living on their own or are married or cohabitating. This information was not available in previous waves of data collection.

There was little support, in this sample of high risk youth, for the hypothesis that teenagers who were less attached to their mothers had a higher incidence of pregnancy. While one may argue that parental attachment is only one variable in a concept called mother-daughter relationship, it is clearly an important concept. Further work will examine this relationship in more detail in an attempt to see whether or not a broader concept of relationship supports this hypothesis. Based on this initial work, however, it would seem that some of this earlier research which was not longitudinal in nature may be suspect.

The work of Jessor and others (Jessor and Jessor, 1977; Donovan and Jessor, 1985; Costa, Jessor, & Donovan, 1992) suggested that one can explain the intercorrelations between different types of problem behaviors by postulating an underlying syndrome of problem behavior. If this hypothesis were true and if one assumes that teenage pregnancy is one of these problem behaviors (as do these authors), one might expect to find correlations between teenage pregnancy and attitudinal measures such as attitudes toward deviance, commitment to positive peers,

commitment to negative peers, peer conventional behavior, peer deviant behavior, and attitudes toward conventional values. While there was some support for some of these measures, by and large, the results indicated that teenagers who got pregnant differed from their non-pregnant peers on only a few of these measures. Even when differences did exist they tended not to be consistent across all waves of the data. Thus, while some might argue that the results do support a more generalized notion of a syndrome of problem behavior, these data seem to indicate that some of these behaviors and attitudes are more singular in nature. This conclusion would be consonant with other research (Mott & Haurin, 1988; Osgood, Johnston, O'Malley, & Bachman, 1988).

The more personal, psychological variables, in general, seem to be more consistently related to pregnancy in teens. With the exception of self-esteem, measures such as isolation and impulsivity did, on the whole, relate to teenage pregnancy in that teens who got pregnant were more likely to be impulsive and isolated than were their non-pregnant peers.

When one examines the relationship between teenage pregnancy and prior delinquency and drug use, one sees a fairly consistent pattern in which teens who become pregnant were almost twice as much more likely to be involved in minor delinquency than were their non-pregnant peers. The differences between involvement in other, more serious types of delinquency, for those who are pregnant versus those who are not, are inconsistent at best.

The story of the relationship between prior drug use and pregnancy is even more compelling. While there were differences in the use of alcohol between those who got pregnant and those who did not, the relationship is strongest for those who used marijuana and other drugs (not including tobacco). For every year, at least twice as many of those who became pregnant used drugs as did those who did not become pregnant. Given the potentially serious consequences of drug use during pregnancy, these results may seem alarming. However, it is important to note that drug use is not characteristic of those who get pregnant and that only twenty-five percent of those who were pregnant used drugs. Hence, while they use drugs more than their non-pregnant peers, they are not heavily involved in the drug culture.

Respondents were asked specific questions about drug use during pregnancy. The vast majority of teens reported no drug use of any kind (including tobacco) during their pregnancies. However, about 20% of them did report some drug usage, especially tobacco usage. These results would tend to indicate that despite intensive media campaigns and warning labels on alcohol and tobacco products, there still remain a significant number of teenagers who continue to use drugs during pregnancy. Some evidence seems to suggest that the offspring of younger mothers are even more susceptible to negative birth outcomes such as low birth weight, small gestational age, and neonatal mortality (Cooper, Leland, & Alexander, 1995). For teenagers to introduce

possible teratogens such as tobacco, alcohol, and drugs into their systems may further compromise both the short-term and long-term health of their offspring.

Examination of self-reports of the consequences of teenage pregnancy leads to a better understanding between the differences found in this study and in other studies. Pregnancy did not cause most of the teens to feel badly about themselves, in contrast the vast number of them reported that it made them feel better about themselves. Only a very few of them got married as the result of being pregnant and few reported having fights with parents. Overall, only about 20% of the pregnant teens reported having getting a new group of friends and about 27% reported dropping out of school. Certainly, the drop-out figures give pause for concern, but these results indicate that some of the commonly held perceptions of pregnant teens are not justified.

In some real sense, these analyses just begin to explore the questions about the precursors and outcomes of teenage pregnancy. Hopefully, they provide some further understanding of this complex problem of teenage pregnancy. Further research will address such additional issues such as whether or not pregnancy was intended, age of the father of the child, and longer term effects of teenage pregnancy on the ability of the teen mother to move into young adulthood with the skills and resources she needs to adapt to the adult world.

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Table 2.3.1: Percent of Teens in Different Living Arrangements
Broken Down by Pregnancy Status*

		<u>Non-</u>	<u>Married/</u>		
		<u>Biological</u>	<u>Biological</u>	<u>Cohabiting</u>	<u>Emancipated</u>
<u>Time 1</u>	PG	25%	75%		
1989	Non PG	34%	66%		
<u>Time 2</u>	PG	20%	80%		
1990	Non PG	35%	65%		
<u>Time 3</u>	PG	15%	85%		
1991	Non PG	36%	64%		
<u>Time 4</u>	PG	13%	58%	12%	17%
1992	Non PG	32%	62%	2%	4%

* With the exception of 1989 results, all chi-square analyses are significant at the .01 level or less.

Table 2.3.2: Number of Teens Pregnant and Percent of Female Population Across Time by Age

Age	<u>Time 1</u> 1989	<u>Time 2</u> 1990	<u>Time 3</u> 1991	<u>Time 4</u> 1992
19				50 (8%)
18			28 (6%)	
17		49 (9.6%)		40 (6%)
16	24 (6.5%)		17 (3.5%)	
15		25 (5%)		8 (1%)
14	17 (4.6%)		5 (1%)	
13		1 (.2%)		3 (.5%)

**Table 2.3.3: Prior Delinquency Involvement Broken down by
Pregnancy Status**

	<u>Time 1</u>	<u>Time 2</u>	<u>Time 3</u>	<u>Time 4</u>
	1989	1990	1991	1992
No Delinquency				
Pregnant	23%	14%	23%	38%
Non-Pregnant	42%	49%	45%	42%
Minor Only				
Pregnant	43%	49%	48%	33%
Non-Pregnant	23%	26%	28%	36%
Serious				
Pregnant	20%	25%	18%	18%
Non-Pregnant	26%	16%	19%	13%
Street				
Pregnant	13%	11%	11%	11%
Non-Pregnant	9%	8%	8%	8%

Note: With the exception of Time 4 (1992), all Chi-square statistics are significant.

Table 2.3.4: Drug Usage Broken Down by Pregnancy Status

	<u>Time 1</u>	<u>Time 2</u>	<u>Time 3</u>	<u>Time 4</u>
	1989	1990	1991	1992
No Drug Use				
Pregnant	46%	43%	58%	52%
Non-Pregnant	68%	71%	74%	64%
Alcohol Use Only				
Pregnant	27%	29%	22%	25%
Non-Pregnant	18%	17%	19%	24%
Marijuana and Other Drugs				
		28%	20%	23%
Pregnant	27%	12%	8%	12%
Non-Pregnant	14%			

Note: All Chi-square statistics significant at .01 level or lower.

Table 2.3.5: Percent of Teens Who Use Tobacco, Alcohol or Drugs
While Pregnant

	<u>Time 3</u>	<u>Time 4</u>
Tobacco	15.8%	15.5%
Alcohol	6.5%	8.6%
Marijuana and Other Drugs	6.2%	4.6%
Total Who Use Drugs	23.3%	19.5%

Table 2.3.6: Percent of Pregnant Teens Who Report Changes in Life Style, Family Environment and Self-Perception

	<u>Time 3</u>	<u>Time 4</u>
Dropped out of school	34.5%	22.6%
Got married	8.0%	2.8%
Felt good about themselves	71.3%	75.3%
Felt bad about themselves	26.8%	26.5%
Got new friends	26.5%	16.5%
Fought with parents	11.7%	15.1%
Had financial problems	31.4%	35.7%

APPENDIX 2.3

Sample Items for Attitudinal Scales

Parental Attachment:

How much do you agree or disagree that you....

- enjoy talking over plans with your parents.
- can talk to you parents about anything.
- depend upon your parents for advice and guidance.

Self Esteem:

I am a useful person to have around.

I feel that I am a person of worth, at least as much as others.

I feel good about myself.

Impulsivity:

Would you strongly agree, somewhat agree, or disagree that

- you...
- act without stopping to think?
- like to do daring things?
- get bored easily?

Isolation:

Would you strongly agree, somewhat agree, or disagree that

- you...
- don't get along with others?

like to be alone?

keep from getting involved with others?

Negative Peer Commitment:

If your group of friends was getting you into trouble....

at home, how likely is it that you would still hang out
with them?

at school, how likely is it that you would still hang
out with them?

with the law, how likely is it that you would still
hang out with them?

Positive Peer Commitment:

If your friends told you not to do something because it
was...

wrong, how likely is it that you would listen to them?

against the law, how likely is it that you would listen
to them?

Peer Conventional Behavior:

During the last year, how many of your friends....

have been involved in school activities?

have been thought of as good students?

have taken part in their own family activities?

Peer Delinquent Behavior:

During the last year, how many of your friends...

skipped school without an excuse?

stolen something worth more than \$100?

attacked someone with the idea of seriously hurting
them?

Attitudes toward Delinquency:

..for someone your age...How wrong is it to...

skip school without an excuse?

steal something worth more than \$100?

sell hard drugs such as heroin, cocaine, crack or LSD?

Attitudes toward Conventional Values:

How important is it to...

have a college education?

have a great deal of money?

save for the future?

2.4 DEVELOPMENTAL GENDER DIFFERENCES IN DELINQUENCY AND VICTIMIZATION

Rachele Espiritu and David H. Huizinga

Official statistic rates and self-report data on delinquency consistently indicate that boys have higher rates of involvement in delinquency than girls. However, the number of females involved in delinquent behavior is currently of national interest and concern, and there is a belief that delinquency rates among females have risen dramatically over the last several years. The rates of victimization of both boys and girls, and the relationship of victimization to delinquent behavior is also of some interest. In this paper, gender differences in developmental growth curves of general delinquency and serious assault and growth curves of general victimization and victimization by physical assault are described. Also examined are gender differences in the "routine activities hypothesis," that suggests that engaging in various forms of delinquency, such as assault, puts one at greater risk of being victimized.

The data are taken from the child and youth samples of the Denver Youth Survey (DYS), and include data from the first five annual surveys. During this period the child sample aged from 7 to 13 and the youth sample from 11 to 19, so that data from individuals representing the full age range from 7 to 19 are available. Data for single ages were obtained by pooling the

information from all those individuals who passed through a given age during the five year period. The general delinquency measure used includes items covering the spectrum of delinquent behavior, status offenses, public disorder, property damage, theft, and minor and serious assault, taken from the self-report child and youth delinquency scales of the DYS. The youth serious assault measure, available only for ages 10 through 19, includes aggravated assault, robbery, gang fights, and rape.

Victimization is measured through a series of self-report items about kinds of victimization. For the overall child measure this includes assaults, robberies (things taken by force), and thefts; and for the youth respondents this includes assaults, robberies, thefts, and rapes. A child measure of assault victimization includes assaults and robberies, and a youth measure of assault victimization includes assaults, robberies, and rape.

Developmental and gender growth curves of delinquency and victimization are presented in Figures 2.4.1 to 2.4.4. As anticipated, the prevalence patterns of overall delinquency for boys and girls show a higher proportion of boys involved in delinquent acts than girls across the age span examined. These gender differences are significantly different from ages 8-12 and 16-19 ($p < .01$), but are not statistically significantly different at ages 13, 14, or 15. Closer examination of figure 2.4.1 shows the expected age curve of delinquency for girls, with a peak in the 14-16 year old age range. However, of some interest, and perhaps of some concern, is the lack of a major decline in

delinquency in the later teenage years for males. Similar patterns, but at lower levels can also be seen for the serious assault subscale in table 2.4.2. Higher (statistically significant) proportions of males report involvement in serious assaults than girls during ages 11-13 and 15-19, and males are higher at age 14, but the gender difference is not significant.

Offending rates, the average number of offenses committed among active offenders, for both overall delinquency and serious assault, indicate that at almost all ages male offenders on the average commit more offenses than do female offenders. For general delinquency, statistically significant differences are found at ages 10,12,14, and 16 through 19. For females, the average frequency of involvement among active offenders increases through age 15 and then decreases. For males, the rate increases through age 18, with a decrease at age 19. Thus substantial gender differences exist at the older teenage years. Offending rates of serious assault also indicate higher levels of involvement among males at most ages, although given the large standard deviations in these measures at specific ages, only the differences at ages 11 and 14 are statistically different. (The high average at age 15 for females results from a few highly active females.)

The victimization experiences of girls and boys in the DYS high-risk sample, displayed in figures 2.4.5 through 2.4.8, also indicate substantial gender differences in prevalence rates across the age span. Differences in the prevalence of general

victimization between genders are statistically significant at ages 7 through 11, and at 16, 17, and 19, and in all cases the victimization rate of males is higher than that of females. Similarly for assault victimizations, rates are statistically different at ages 7 through 13, 15 through 17, and 19. Of some concern is the relatively large proportion of children and youth who report being victimized. Both genders report higher prevalence of victimization (45-65%) at the younger ages of 7-10, which probably reflects reports of relatively minor fights. In the older years, however, reported victimization remains quite high, generally in the 35-35% range for overall victimization and 15-30% for assaultive victimization. Clearly a sizeable proportion of both children and youth are at risk of being victimized.

In contrast to prevalence of victimization, few gender differences were found in the annual frequency rates of being victimized. The reported frequency of being victimized in a given year is generally 2-5 times for both general and assaultive victimization. Although males generally report slightly higher frequencies of being victimized in comparison to females, these differences are not statistically significant.

The relationship between concurrent delinquency and victimization for girls and boys, as expressed by correlation coefficients, is presented in Table 2.4.1. These correlation coefficients indicate a substantially different relationship between concurrent victimization and delinquency across gender

groups. For girls, there is no significant relationship between current general victimization and either general delinquency, assaultive behavior, or other delinquency measures. For males, however, there is a substantial relationship for all kinds of delinquency. On the other hand, for both males and females, concurrent assaultive victimization is significantly related to all the forms of delinquency examined. The size of the relationship is substantially higher for males than for females, however.

These findings support the notion that "routine activities" play a part in delinquency and victimization. Both girls and boys who are involved in assaultive behavior also are more likely to report being victims of assault, and, for boys, involvement in general delinquency (including theft offenses) is related to general victimization. There are, however, sizeable gender differences in the strength of this relationship. Finally, it should be noted that explanations for the observed gender differences and examination of the relationship between delinquency and concurrent victimization in more extensive models of delinquent behavior and victimization are needed and are being pursued in ongoing work of the DYS.

Table 2.4.1: Correlations Between Concurrent Victimization and Delinquency

		<u>Delinquency</u>			
		<u>General</u>	<u>Status</u>	<u>Property</u>	<u>Assault</u>
General	Females	.08	.07	.03	.09
Victimization	Males	.62	.42	.38	.87
Assaultive	Females	.25	.19	.11	.27
Victimization	Males	.60	.39	.34	.89

Figure 2.4.1

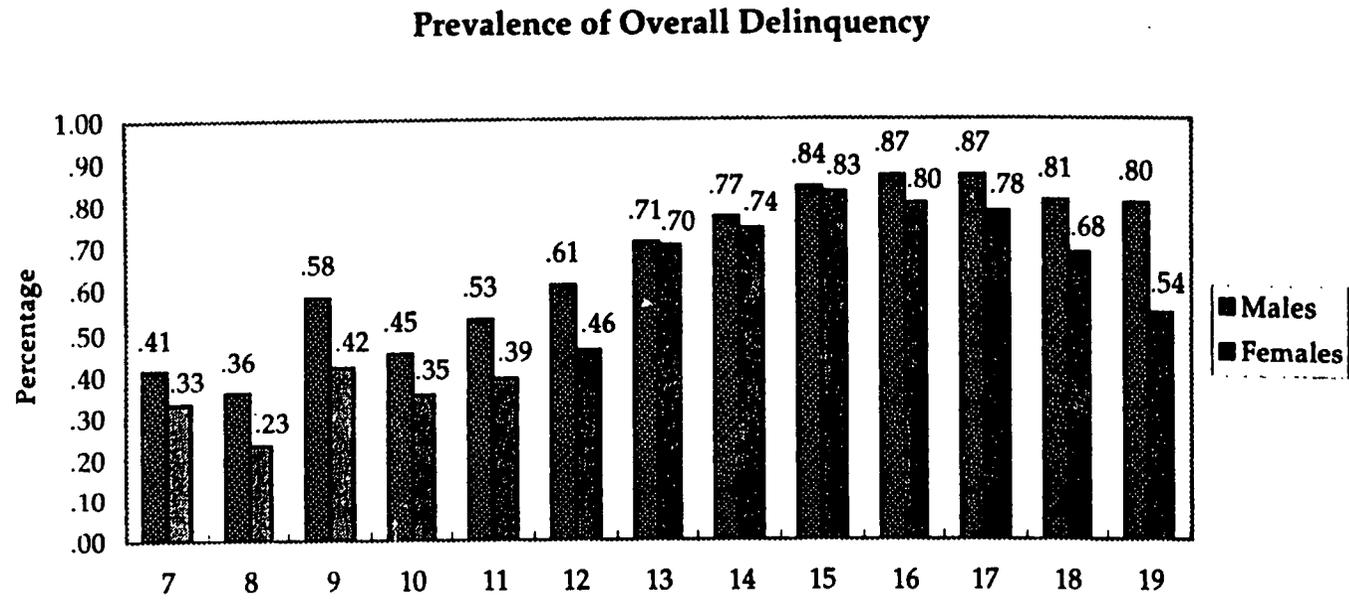


Figure 2.4.2

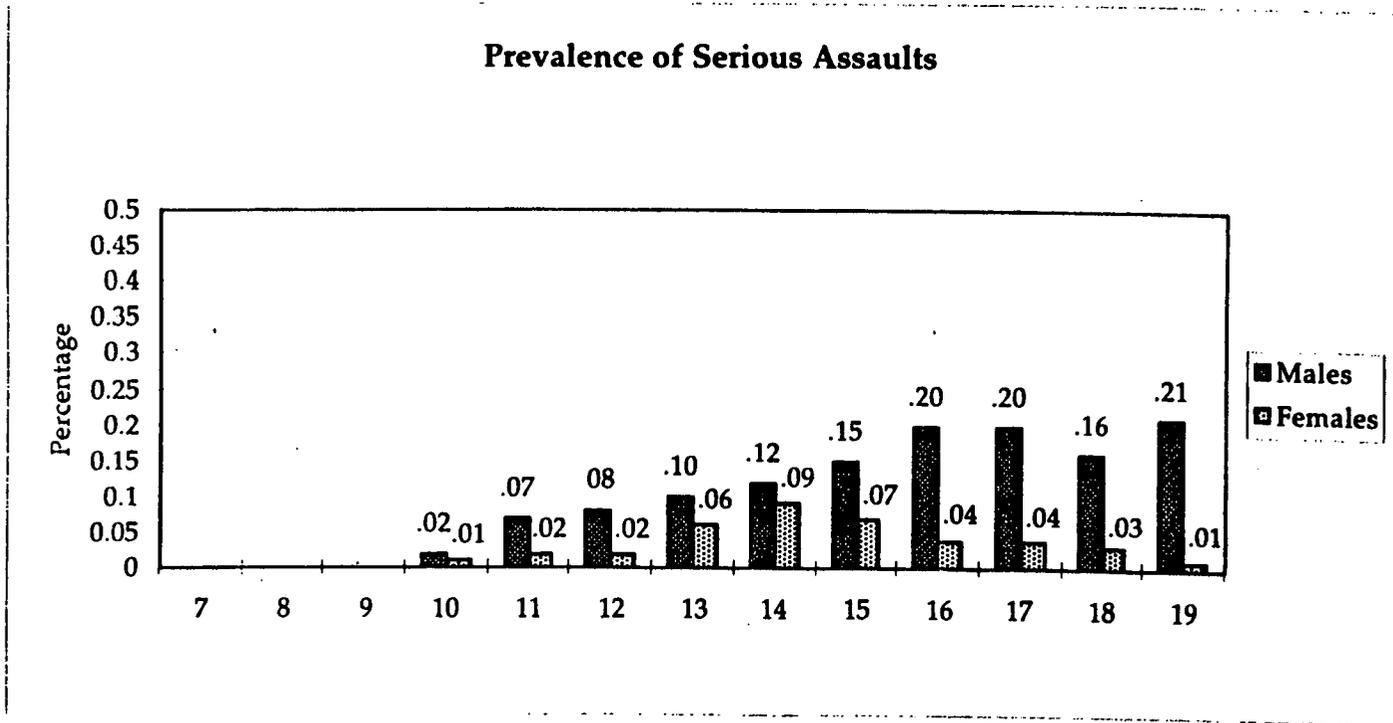


Figure 2.4.3

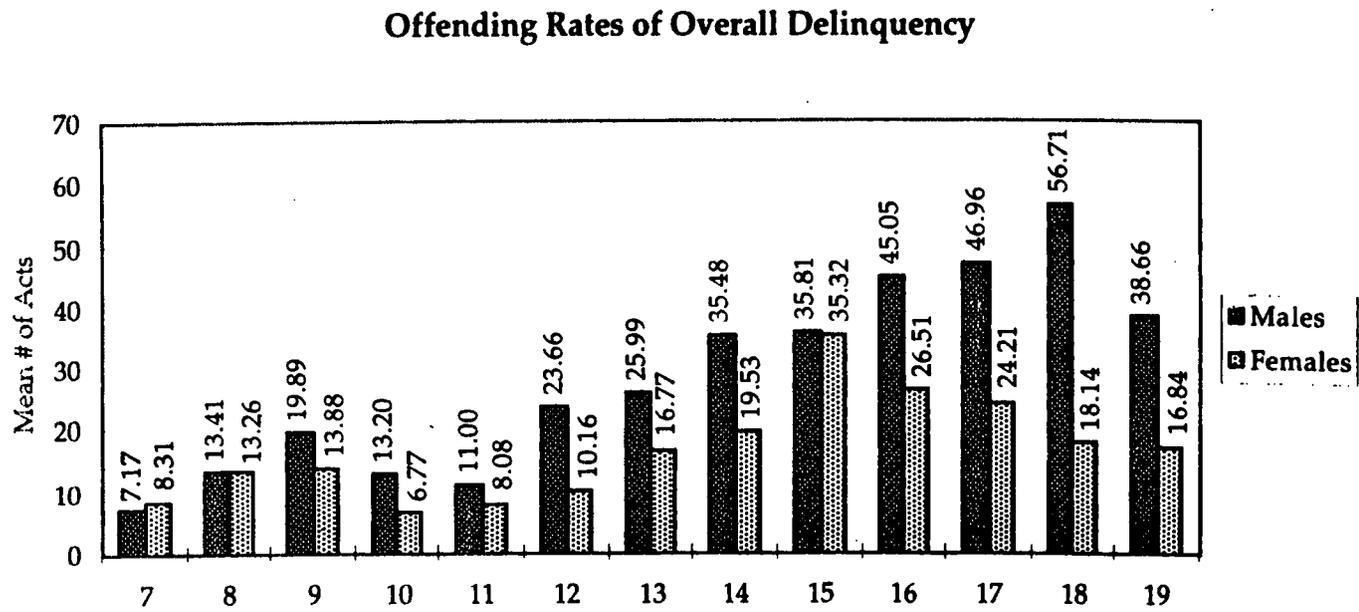
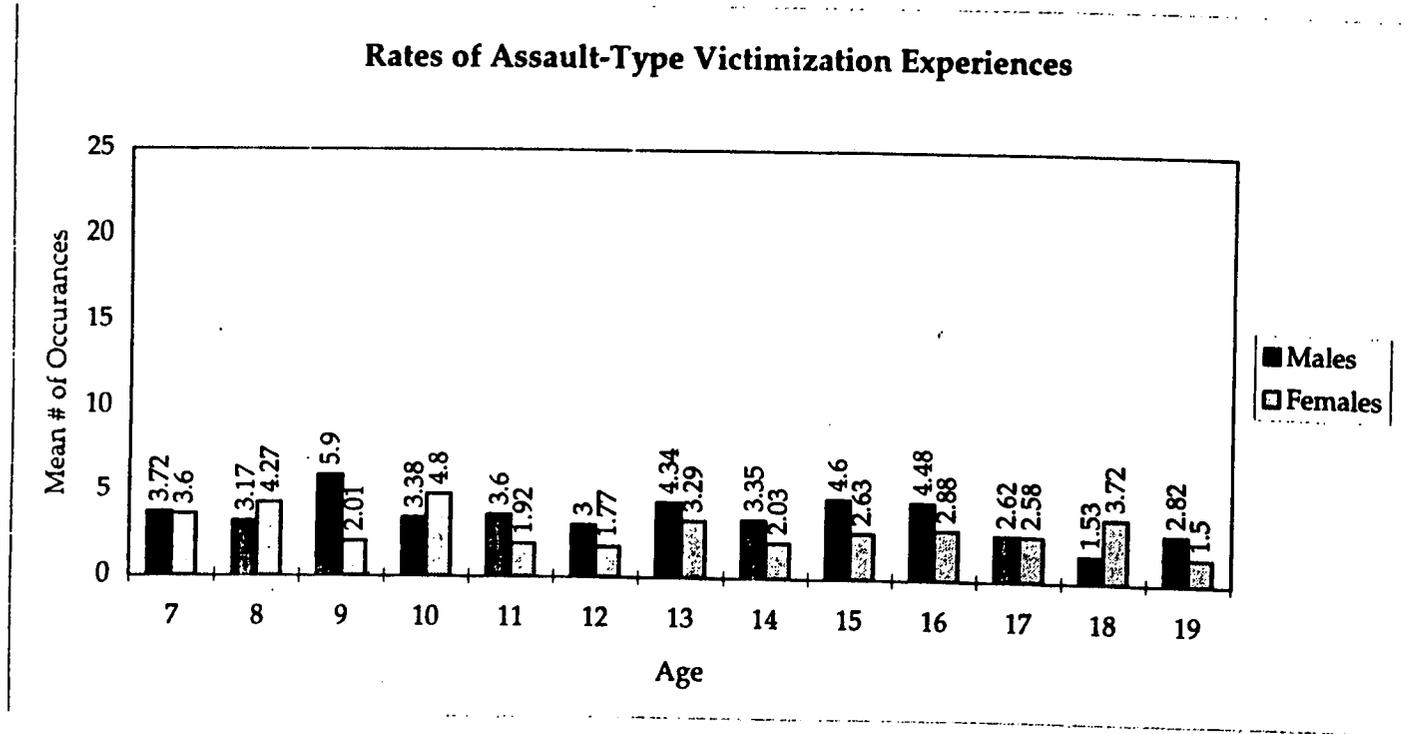


Figure 2.4.8





3. SITE-SPECIFIC ANALYSES: PITTSBURGH YOUTH STUDY

3.1 DEATHS AND WOUNDED BY GUN-RELATED VIOLENCE

Rolf Loeber, Mary Smalley, George Tita, J. Cohen,
Welmoet B. Van Kammen, and Magda Stouthamer-Loeber

The level of juvenile violence has increased dramatically in the last decade, particularly in terms of homicide in the 14 to 17 year-old age group. It is now, after vehicle accidents, the leading cause of fatal injuries. Since the mid 1980s the homicide victimization rate for this age group has nearly doubled. The increase in juvenile homicides has been concentrated in the African-American subpopulation (Snyder & Sickmund, 1995).

The dramatic increase in juvenile homicide in the past decade in the United States resulted largely from an increase in gun-related killings. National data from 1991 show that more than half of the juvenile homicide victims were killed with a firearm (Snyder & Sickmund, 1995). Not surprisingly, male juvenile offenders and inner-city high-school males are among those most likely to carry guns, with those dealing in drugs particularly likely to carry guns (Sheley & Wight, 1993, cited in O'Donnell, 1995). In one longitudinal sample, half the boys under 16 years of age reported owning a firearm as opposed to five percent of the girls. The boys in this sample reported that

firearms were available in 81% of their households (Cairns & Cairns, 1994). Lizotte, Tesoriero, Thornberry, and Krohn (1994) have shown that juveniles' ownership of guns for protection rather than for sportsmen's use is related to delinquent offending.

Relatively little is known about the developmental history of homicide victims. Are they mostly innocent bystanders caught in cross-fire? Or are they mostly individuals who engage in high-risk delinquent activities and whose association and conflict with delinquent peers results in the homicides? And were they carrying a gun at the time of death, and what were the circumstances under which the homicide took place?

Crime statistics often focus on homicide rates. However, a case can be made that, given imperfect marksmanship, homicide rates are a poor reflection of community violence because such rates do not take into account the number of youth wounded by gunfire. The woundings should not be discounted because of the serious infliction of physical harm caused by gunfire. It is likely that more youth are wounded than killed by guns, but delinquency studies do not reveal to what proportion. The wounding of juveniles by guns, in addition to those killed, constitutes important information about the level of violence in communities. This section addresses the following questions:

- 1) How high is the mortality rate among juveniles in the Pittsburgh Youth Study?
- 2) What is the prevalence of gunshot wounds in the

Pittsburgh Youth Study?

3) How are the backgrounds of gunshot victims different from the total sample? from matched controls?

4) How delinquent were homicide victims compared to controls?

5) What were the circumstances surrounding the killings as evidenced by police reports?

Methods

Participants. Participants were participants in the Pittsburgh Youth Study (PHYS), a longitudinal survey of the causes and correlates of delinquency. The study consists of three samples of boys who were in grades 1, 4, and 7 when the study began. Potential participants were randomly selected from a list of all boys in these grades in the Pittsburgh Public Schools. At the time of the sample selection, 72% of all school children in Pittsburgh attended public schools. Of those selected for this study, 85% of the boys and their parents consented to participate in the study, resulting in a sample of about 850 boys in each of the grades. There were no significant differences in achievement test scores or the proportion of African-American students between study participants and the district-wide male student population.

During the initial screening assessments (hereafter Phase S), each boy and his main caregiver were interviewed using the appropriate form of the Child Behavior Checklist (Achenbach &

Edelbrock, 1983), supplemented by additional items drawn from a delinquency inventory (Elliott, Huizinga, & Ageton, 1985) to identify boys at risk for delinquency and criminal behavior. One of the boys' teachers also rated the boy using a form of the Child Behavior Checklist (CBCL). The information provided by the three informants was combined into an overall risk index by counting a delinquent behavior present if the boy, his caretaker, or his teacher reported the behavior as present. Boys ranking in the top 30% of the risk index were retained in the study, together with an additional 30% randomly selected from the remaining 70%. The resulting samples for the youngest (n=503) and oldest (n=506) cohorts have been followed up regularly over a period of 7 years. The middle sample (n=508) was followed-up for the first 3.5 years of the study. The average cooperation rates were high; 95.26% for the youngest sample (range: 93.2 - 99.6), 96.25% for the middle sample (range: 93.9 - 99.4), and 92.74% for the oldest sample (range: 86.0 - 99.8). At the final phase of data collection used for the present study, the average age for the youngest, middle, and oldest samples, respectively, were 11.5, 12.8, and 19.3 years.

After screening, about half of the boys were African-American and half were Caucasian; this is comparable to the racial composition of the Pittsburgh Public Schools. Approximately 40% of the boys lived with a single parent, and about 40% of the caretakers received public assistance (for additional details about the sample, see Van Kammen, Loeber, &

Stouthamer-Loeber, 1991).

Measures

Delinquency. At the first follow-up (Phase A) six-months after the screening (Phase S), the primary caretaker was administered the Diagnostic Schedule for Children (DISC) (Costello, Edelbrock, Dulcan, Kalas, & Klaric, 1987), a structured interview covering lifetime DSM-III-R symptomatology. Boys in the middle and oldest samples were administered the Self-Reported Delinquency Scale (SRD) (Elliott, Huizinga, & Ageton, 1985) and the Youth Self-Report (YSR) (Achenbach & Edelbrock, 1983), and the child version of the CBCL which covered occurrence of problem behavior over the past year since the previous assessment.

Because the SRD was judged to be too difficult to understand for the younger children in the youngest sample, boys in the youngest sample were administered the 33-item Self-Reported Antisocial Behavior Scale (SRA), which included six items on substance use (Loeber, Stouthamer-Loeber, Van Kammen, & Farrington, 1989), for the first five phases following the screening (A-E). For the final three phases (G, H, and J), the boys completed the SRD.

The General Delinquency Seriousness Classification variable places a boy in the category of the most serious behavior ever committed. The information is derived from the parent (CBCL, Lifetime Scale), teacher (TRF), and from the boy himself (SRD and YSR). In order to classify delinquent behaviors according to

seriousness, the severity ratings developed by Wolfgang, Figlio, Tracy, and Singer (1985) were used. Each behavior is represented by one or more questions and one or more respondents. Delinquent acts were classified in the following manner: Level 1

Delinquency: No delinquency. Level 2 Delinquency: Minor delinquency at home, such as stealing minor amounts of money from one's parent's purse or minor vandalism. Level 3 Delinquency: Minor delinquency outside of the home, including minor forms of theft, such as shoplifting and stealing something worth less than \$5, and vandalism and minor fraud, such as not paying for a bus ride. Level 4 Delinquency: Moderately serious delinquency, such as any theft over \$5, gang fighting, carrying weapons, and joyriding. Level 5 Delinquency: Serious delinquency, such as car theft, breaking and entering, strongarming, attack to seriously hurt or kill, forced sex, or selling drugs. Level 6 Delinquency: Varied serious delinquency, which indicates that the boy committed more than one type of Serious Delinquent Act. For a more detailed description of the development of this classification, see Stouthamer-Loeber, Loeber, and Thomas (1992).

In addition, prospective and retrospective information from the boy and his parent was used to assign boys to Developmental Pathways in disruptive and delinquent behavior (Loeber et al., 1993). Prospective information was generated by the primary caretaker through an extended version of the Child Behavior Checklist (CBCL) (Achenbach & Edelbrock, 1983; Loeber et al., 1991), and by the boys through both the SRD and YSR. Prospective

data were collected for the middle and oldest samples through Phase E (mean ages at E: 12.3 and 15.4 years) and for the youngest sample through Phase H (mean age at H: 10.5 years). When available, information was pooled across informants so that a behavior was considered positive if it was reported by either the child or the caretaker. In the case of defiant behavior, information was gathered from the caretaker only, and information regarding violent behavior was gathered only from the child (see Loeber et al., 1993, for details). Retrospective data were gathered at Phase S from the boys, and at phase A from the caretakers.

Court Petitions. Information collected from juvenile court provided an additional indicator of delinquency. Records of the juvenile court were coded according to a prescribed format (Maguin, 1994), resulting in indicators of the prevalence of petitions lodged before the court because of index and non-index juvenile delinquency charges. If a boy had moved away from the area under jurisdiction of the juvenile court of Pittsburgh during the study, he was deleted from further analyses. In the case of multiple charges, a hierarchical rule was applied so that only the most serious violent charge was indicated. Index violent offenses were defined as aggravated assault, rape, and robbery. Index property offenses were defined as burglary, larceny, arson, and motor vehicle theft. Further, a distinction was made between violent, property, and drug Non-index offenses.

Parents' child rearing practices. Supervision/Involvement:

Parents and boys were administered versions of the Supervision/Involvement Scale, which concern the parents' knowledge of the boy's whereabouts, the amount of joint discussions, planning, and activities, and the amount of time that the boy is unsupervised. The boy reported on his mother as well as on his father, whereas the parent reported only on her knowledge of and interaction with the child. Communication: The Revised Parent-Adolescent Communication Form was administered to the boys and to the parents, and measures the quality of parent-child communication and display of affect.

Neighborhood classification. Participants were assigned a value reflecting a set of socio-economic indicators of individuals living in their neighborhood based on the 1990 census data. Using the neighborhood classification developed by Wikström (Loeber & Wikström, 1993; Wikström, 1995), participants were assigned a value on a three-point scale indicating whether the participant lived in one of 25% lowest SES neighborhoods, one of the 25% highest SES neighborhoods, or one of the 50% middle SES neighborhoods.

Reports of injuries or deaths. Three groups of victims of violent crime were investigated: those who were killed violently, those who were injured by guns, and those who were injured by a weapon other than a gun seriously enough to be hospitalized. With the exception of one homicide victim in the middle sample, information on the date and circumstances of death came from the interviewers' conversations with family members at the time of

follow-up.

In addition, for those participants killed within the city of Pittsburgh, data were collected from police homicide records. Paper copies of police homicide records were reviewed at the police homicide bureau for the years 1987 through 1994. Extensive notes were taken about the victim and defendants or suspects in the crime. Information was also gathered from the records about the location of the incident, the events leading up to the incident, the criminal records of victims and perpetrators, the weapons used, and the disposition of the case. The review of homicide records also provided information about the death of one participant from the middle sample, which is no longer followed-up on a regular basis. Yearly contacts with participants and their families, including those participants who were not interviewed, regular reviews of local newspapers, and data from homicide records allowed us to accurately determine the mortality rate.

Those who had been wounded but not killed were identified based on their self-reports in the health questionnaire. Victimization data were collected from participants in the youngest and oldest samples for the previous three phases (2 years for youngest: G, H, J; 3 years for oldest: G, I, K); victimization data were not available for participants in the middle sample.

Those who indicated that they had been wounded and that the weapon used was a gun were classified as "wounded by a gun."

Those who indicated that they had been wounded by a knife or wounded by some other weapon (not kicking or hitting) seriously enough that they were hospitalized were classified as "wounded by other than a gun." The prevalence of being wounded by some other weapon and not being hospitalized was very high, therefore, individuals experiencing this relatively less serious injury were not included in the analyses.

Analyses

All data were weighted in order to correct for the selection procedure and provide population estimates for the original randomly selected sample from the public schools in Pittsburgh.

Creation of Comparison Group

Rather than creating a control group, resampling methods were used in order to take advantage of the data already collected from a relatively large sample of potential matching controls. First, we determined the number of individuals who matched each of the participants in the victim group on age, race, and neighborhood classification. For two of the victims, only two matching participants were found. Therefore, two participants were randomly selected to match each of the victims. From this group of 84 controls, 50 random samples of 42 participants were taken.

For each of the analyses of this study, the statistic of interest was calculated separately for each of the 50 samples. Then, t-tests were used to compare the mean of the resulting

sampling distribution to the mean of the observed sample statistic calculated for the victims.

Results

Prevalence of Injury and Death

Table 3.1.1 shows the prevalence of homicides with guns, homicides other than by guns, accidental deaths, being wounded by guns, and being wounded other than by guns for individuals in all three samples (data on injuries were not available for the middle sample). The table also includes the weighted percentage of those who were injured or killed.

Of the 503 participants in the youngest sample who had an average age of 14 years at the time of homicide data collection, none were victims of homicide. However, our records showed that one participant (.2%) had reported being wounded by a gun, and 9 participants (1.5%) reported being wounded by a weapon other than a gun and then hospitalized. Among the 508 participants in the middle sample, who were on average 17 years of age at the time of official homicide data collection, four participants (.7%) had been killed by guns, and two (.3%) died accidentally. As discussed previously, injury data were not available for the middle sample. Finally, of the 506 participants in the oldest sample, who on average were 20 years old at the time of homicide data collection, seven (1.2%) had been killed by guns, and one participant (.1%) had been beaten to death. In addition, in the oldest sample there were two accidental deaths (.4%), 28

individuals wounded by guns (5.3%), and 13 participants wounded by a weapon other than a gun and hospitalized (2.4%).

For the oldest sample, we calculated the total number of individuals who were wounded seriously enough to be hospitalized or killed. Percentages were not calculated for the youngest sample, which had not passed through the risk window yet, or the middle sample for whom there was missing data on injuries. Results show that 9.4% of the participants in the oldest sample were killed or wounded seriously enough to be hospitalized. Calculating the percentages separately by ethnicity showed that the percentage of participants who were killed or wounded was significantly higher for African-Americans (12.7%) than for Caucasians (4.9%) ($X^2 = 8.48$, $df=1$, $p < .01$).

Characteristics of Participants Who Were Injured or Killed by Guns

Next, we investigated the characteristics of the participants who were killed or wounded by guns ($n=40$). For the 11 participants who died as a result of gunshot wounds, the mean age at death was 19.6 years. For the 29 individuals who were wounded but not killed by guns, the mean age of the injury was 17.8 years. Almost all of those killed or wounded by guns were African-American, including 100% of those killed by guns and 90.5% of those wounded by guns.

Comparison of the Backgrounds of Gun Victims and Nonvictims in the Oldest Sample

In order to understand how gunshot victims are different from nonvictims, the backgrounds of the individuals in the oldest sample who had been injured or killed by guns (n=35) were compared to the backgrounds of all other participants in the oldest sample. These analyses were not undertaken for the middle and youngest samples because the proportions of victims in these samples were small, probably due to the young age of the youngest sample and incomplete data for the middle sample.

Chi-square analyses showed differences between victims and nonvictims in individual-, family-, and macro-level factors measured at phase A (Table 3.1.2). With regard to individual-level factors, results showed that victims were significantly more likely than nonvictims to have low academic achievement (40% vs. 23%). There was also a nonsignificant trend indicating that victims were more likely to report having a depressed mood at Phase A.

Comparisons of victims and nonvictims also showed that victims were significantly more likely to receive poor parental supervision; 50% of victims received poor parental supervision as opposed to 24% of nonvictims. There was also a nonsignificant trend indicating that victims and their parents were more likely to have poor communication than the nonvictims and their parents. There were no significant differences in the victims' closeness to their mothers or in the prevalence of their fathers' behavior

problems.

As to macro-level factors, victims were significantly more likely to come from families with lower socio-economic status (51%) than nonvictims (25%). Their families were also more likely to receive public assistance (66% vs. 37%), and they were more likely to have a mother who was single (88% vs. 66%) and unemployed (43% vs. 24%). There were no significant differences in the likelihood of the parents having a poor impression of the neighborhood.

Comparisons of the Backgrounds of Victims to a Sampling Distribution of Controls

These same background variables measured at Phase A were investigated for the entire group of those who were killed or injured (n=40) in all three samples. The percentage of victims who were in the high-risk group was compared to the mean percentage of those in the high-risk group for the 50 samples of 40 individuals from a group of 80 matched controls. The results of t-tests comparing the sample percentages to the mean percentages of controls are presented in Table 3.1.3.

With regard to individual-level factors, victims were significantly more likely to have low academic achievement (43%) than controls (26%) and significantly more likely to have depressed mood at Phase A (32%) than controls (21%). An investigation of family-level factors showed that victims were also more like than controls to receive poor parental supervision

(49% vs. 29%), to have poor parent/child communication (36% vs. 19%), not to be close to their mothers (26% vs. 17%), and to have a father with behavior problems (27% vs. 14%).

With regard to macro-level variables, victims were significantly more likely than controls to have low family SES (48% vs. 26%) and to receive public assistance (69% vs. 47%). There were no significant differences between victims and controls in the likelihood of the parents having a poor perception of the neighborhood or in the likelihood of the boy having a single or an unemployed mother.

History of Delinquency and High-risk Behaviors

The results of t-tests comparing the likelihood of having a history of delinquency or high-risk behaviors for victims and controls are presented in Table 3.1.4. With regard to delinquency behaviors, victims were more likely than controls to have ever exhibited behaviors classified as serious delinquency (87% vs. 58%), more likely to have been involved in a gang fight (66% vs. 33%), and more likely to have sold drugs (60% vs. 29%). However, there were no differences between victims and controls in the likelihood that they belonged to a group of early onsetters for serious delinquency.

With regard to the pathways classification, victims were more likely to persist in the Overt Pathway (59% vs. 34%), the Covert Pathway (68% vs. 40%), the Authority Conflict Pathway (91% vs. 60%), and in Multiple Pathways (75% vs. 64%).

Finally with regard to weapon use, victims were more likely to carry a hidden weapon (87% vs. 47%), to come from a family who owns guns (57% vs. 20%), to own a gun himself (61% vs. 25%), and to take his own gun out of the house other than for the purpose of hunting (61% vs. 24%).

History of Court Petitions

T-tests were performed comparing the juvenile court records for victims and controls (Table 3.1.5). Results showed that victims were more likely than controls to have ever had a court petition (69% vs. 47%). Analyses investigating specific types of court petitions showed that victims were more likely to have court petitions for both index (58% vs. 36%) and non-index offenses (65% vs. 45%). Results showed that victims were more likely to have petitions for index property offenses (49% vs. 25%), but results showed no significant differences between victims and controls in the likelihood of having petitions for index violent offenses.

With regard to different types of non-index offenses, victims were more likely than controls to have petitions for non-index violent offenses (34% vs 25%), non-index property offenses (54% vs 28%), and non-index drug offenses (37% vs 14%).

Circumstances of Death for Homicide Victims

Information about the circumstances of death for nine of the 11 homicide victims is presented in Table 3.1.6. With regard to

the motive of the homicide, for 44% of the homicides the motive was a gang rivalry or gang hit. The motive for 22% of the homicides was a dispute over drugs, and the motive for the remaining 33% was escalation of conflict.

According to police homicide records, 78% of the homicide victims were known to be gang members and 44% were known to be drug dealers. Further, 44% of the victims were armed with a gun at the time of death. With regard to the perpetrators, 78% were known to be gang members and 33% were known to be drug dealers.

Finally, a majority of homicide victims were killed with automatic or semi-automatic weapons (56%) as opposed to single shot handguns (44%).

Discussion

In the oldest sample, almost one in ten of the participants by age 19 had been wounded or killed by guns. Two-and-a-half times as many African-American compared to Caucasian males were wounded or killed. However, all of the homicide victims were of African-American ethnicity. Proportionally fewer participants were killed or wounded by guns in the two younger samples, but these figures are expected to change as they age into the risk window of exposure to violence.

Assessments of the participants prior to their being wounded or killed allowed an unique perspective on their own lives up to that point. The victims, compared to controls, had poor academical performance. In addition, victims and controls

differed according to several aspects of family functioning: victims were less supervised by their parent, had poorer communication with their parent, were not close to their mother, and had a father with a history of behavior problems. Moreover, victims tended to come from families with a low socio-economic status, and families on welfare. Remarkably, parents' reports of the qualities of the neighborhood in which the family lived were not worse for victims as compared to controls.

The study also addressed the history of problem behaviors in victims and controls. Victims had more often exhibited serious delinquency, gang fights, and selling of drugs. Using a developmental pathway classification (Loeber et al., 1993), victims tended to have progressed more in the Overt, Covert, or Authority Conflict Pathways, or a combination of them. Victims also tended to carry a hidden weapon, own a gun, and take a gun outside of the house other than for the purpose of hunting. Thus, the majority of the victims had a delinquent life-style, which included ownership or carrying of a lethal weapon.

The highly delinquent behavior of the victims was further confirmed by juvenile court records, showing that victims, compared to controls, were more often brought to court for both index and non-index offenses. Within the category of non-index offenses, victims were more often brought to court for violent and property offenses and for drug offenses. Thus, several sources confirmed that victims had a history of engaging in repeated serious and non-serious forms of delinquency.

The data suggest that these delinquent activities led to victimization. For instance, police reports of the circumstance of the homicides indicate that motives for homicide in 44% of the cases for which data were available included gang rivalry or a gang hit, and 22% concerned a dispute over drugs. In 33% of the homicide cases the killing resulted from an escalation of an existing conflict. Police records also indicated that three quarters of the homicide victims were known as gang members, and less than half were known as drug dealers. In short, the proximal events leading to death tended to be serious delinquent activities. The police records also show that in more than half of the killings, semi-automatic weapons as opposed to single-shot handguns were used. Thus, lethality was also likely to be the result of the weapon used.

The rate of homicide in the oldest sample should be seen in the light of an overall large increase in juvenile homicides that took place in Pittsburgh between 1988 and 1993 (Bureau of Police, 1993). Since then, the rate of juvenile killings has somewhat abated. However, we hypothesize that the circumstances under which death or injury by guns tends to take place will remain the same. First, we see initial steps towards delinquency as a result of poor family functioning, and second, as a result of juveniles' association with delinquent peers and their engaging in high-risk delinquent acts, particularly gang membership (Esbensen & Huizinga, 1993; Thornberry et al., 1993), criminal victimization (van Kammen & Loeber, 1996), gun ownership (Lizotte

et al., 1994), and drug dealing (Blumstein, 1995). Programs to reduce injury and death, therefore, need to address these intermediate risk factors.

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Table 3.1.1: Prevalence of Death and Gunshot Wounds in the Pittsburgh Youth Study *

	Sample: Youngest (n=503)		Middle (n=508)		Oldest (n=506)	
	n	%	n	%	n	% ^a
Homicides						
by guns	0	0	4	.7	7	1.2
other than by guns	0	0	0	0	1	.1
Accidental deaths	0	0	2	.3	2	.4
Wounded by guns, but did not die	1	.2	- ^b	- ^b	28	5.3
Wounded other than by guns (hospitalized)	9	1.5	- ^b	- ^b	13	2.4
	Total for Oldest Sample				51	9.4
	(by ethnicity)		African-American		(40)	(12.7)
			Caucasian		(11)	(4.9)

* All percentages weighted.

^b Injury information unavailable for middle sample.

Table 3.1.2: Comparisons of backgrounds of homicide and gunshot victims in the oldest sample (n=35) to non-victims in the oldest sample (n=471).

	% Victims	% Non- Victims	Odds Ratio
Individual-level Factors			
Low academic achievement (A)	40	23	2.19*
Depressed mood (A)	34	22	1.86a
Family-level Factors			
Poor parental supervision (A)	50	24	3.14***
Poor parent/child communication (A)	37	24	1.85a
Not close to mom (A)	29	19	1.72
Father behavior problems (A)	21	15	1.51
Macro-level Factors			
Low family socio-economic status (A)	51	25	3.89***
Bad neighborhood (parent impression) (A)	35	25	1.67
Family receives public assistance (A)	66	37	3.23**
Single mother (A)	88	66	3.89***
Unemployed mother (A)	43	24	2.44*

A = Phase A.

* $p < .05$; ** $p < .01$; *** $p < .001$; a = $p < .10$.

Table 3.1.3: Comparisons of backgrounds at Phase A of all homicide and gunshot victims (n=40) to the mean of 50 samples from a group of matched controls (n=80).

	% of Victims	Mean % of samples of controls	t
Individual-level factors			
Academic Achievement	43	25.6	3.02**
Depressed mood	33	21.4	2.64**
Family-level factors			
Poor parental supervision	49	29	4.21****
Poor parent/child communication	36	19	3.80***
Not close to mom	26	17	2.12*
Father behavior problems	27	14	2.93**
Macro-level factors			
Socio-economic status	48	26	4.07****
Parent's impression of neighborhood	36	39	-.41
Family receives public assistance	67	47	3.36**
Unemployed mother	46	37	.049
Live with only one parent	85	78	1.23

* p < .05; ** p < .01; *** p < .001; **** p < .0001.

Table 3.1.4: History of delinquency and high-risk behaviors for homicide and gunshot victims (n=42) compared to a sampling distribution of 50 random samples of matched controls.

	% Victims	Mean % for 50 samples of controls	t
Delinquent Behaviors ^a			
Serious Delinquency ^b	87	58	3.75****
Involved in Gang Fight	66	33	5.79****
Sold Drugs	60	29	5.75****
Early Onset of Serious Delinquency, ^c	35	40	-.659
Pathways			
Persist in Overt Pathway	59	34	4.29****
Persist in Covert Pathway	68	40	3.36***
Persist in Authority Conflict Pathway	91	60	4.81****
Persist in Multiple Pathways	75	64	1.72*
Weapons			
Carried Hidden Weapon	87	47	6.39****
Family Owns Gun	57	20	7.89****
Participant Owns Gun	61	25	6.23****
Participant Carries Own Gun	61	24	7.33****

^a In addition to retrospective data, middle sample: 3.5 years prospective data; oldest sample: 6 years of prospective data.

^b Caretaker, teacher and self-reported delinquency combined.

^c Self-reported Delinquency only; Individuals onsetting before age 13.

*** p < .001; **** p < .0001.

Table 3.1.5: Prevalence of court petitions for homicide victims (n=37)* and matched controls (victims compared to sampling distribution of controls)

	% of victims	Mean % of 50 samples of controls	t
Any Court Petition	69	47	3.79***
Index Offenses	58	36	3.60***
Violent	31	25	1.22
Property	49	25	4.90****
Non-Index Offenses	65	45	3.76***
Violent	34	25	1.94*
Property	54	28	5.14****
Drug	37	14	6.34****

* Three of the 40 victims did not consent to the release of their court records.

* p < .05; *** p < .001; **** p < .0001.

Table 3.1.6: Circumstances of Death for Homicide Victims (n=9)*
as recorded in police homicide records.

Motive . . .	
Gang Rivalry/Gang Hit	44%
Dispute over drugs	22%
Escalation in conflict	33%
Victim known to be . . .	
Gang Member	78%
Drug Dealer	44%
Armed with gun at time of death	44%
Perpetrator known to be . . .	
Gang Member	78%
Drug Dealer	33%
Weapon used in homicide . . .	
Automatic/Semi-Automatic weapon	56%
Single shot handgun	44%

* Police Homicide records were available for 9 of the 11 homicide victims.

3.2 TRANSATLANTIC REPLICABILITY OF RISK FACTORS IN THE DEVELOPMENT OF DELINQUENCY

David P. Farrington and Rolf Loeber

This study investigates the replicability of risk factors for delinquency across time and place. It compares the development of offending in the Cambridge Study in Delinquent Development, which is a prospective longitudinal survey of 411 London boys originally aged 8-9 in 1961-62, and in the middle sample of the Pittsburgh Youth Study, comprising 508 Pittsburgh boys originally aged 10-11 in 1987-88. It seeks to establish which risk factors during childhood (age 8-10) predict court appearances for delinquency in adolescence (age 10-16) in English and American samples of inner-city boys in different time periods (1963-71 in London and 1987-94 in Pittsburgh).

Systematic comparisons of results obtained in two longitudinal surveys are rare. Some researchers have compared their results with previously published data from other surveys. For example, Pulkkinen (1988) analyzed her Finland longitudinal survey of males to see how comparable their criminal career features were to the London data reported by Farrington (1983, 1986). Direct, point-by-point, collaborative comparisons are less common. However, Farrington and Wikström (1994) systematically compared criminal career features (e.g. prevalence and frequency of offending at different ages, ages of onset) for

the London boys and for working-class Stockholm boys from Project Metropolitan, also born in 1953 (Janson, 1984; Wikström, 1987). They took various steps to increase comparability, for example by restricting the analyses to the same range of offenses in both samples. They found some similarities between the samples (e.g. in the cumulative prevalence curves) but also some dissimilarities (e.g. in the frequency of offending at different ages).

Pulkkinen and Tremblay (1992) investigated similarities between two longitudinal studies of boys, in Jyvaskyla, Finland, and Montreal, Canada. They cluster-analyzed five scales derived from teacher ratings (aggression, anxiety, inattention, hyperactivity, and prosocial behavior) and found that 8 similar clusters of boys were obtained in each country. The multiple-problem boys were most likely to have later delinquent outcomes. This study has some similarities with the cross-sectional comparison of American and Dutch boys by Achenbach et al. (1987). They factor-analyzed Child Behavior Checklists completed by parents in each country, and concluded that 7 empirically derived behavioral syndromes were replicable.

The only previous systematic comparisons of risk factors for delinquency in two prospective longitudinal surveys in different countries were carried out by Farrington et al. (1982) and Moffitt et al. (1995). Farrington et al. compared the relationship between personality factors and delinquency in London and Montreal. Moffitt et al. investigated the

relationship between personality and intelligence measures and delinquency in the Dunedin (New Zealand) and Pittsburgh studies. They found that constraint (risk-taking as opposed to caution), negative emotionality (a low threshold for emotions such as anger and fear) and verbal intelligence were correlated with delinquency in both countries. The present comparison includes a much wider range of risk factors and focusses on their ability to predict later offending.

Cross-national comparisons of risk factors for delinquency are important for addressing the question of how far the causes of delinquency are similar in different times and places, and hence how far theories of delinquency can be generalized over time and place. A related issue is how far interventions needed to reduce or prevent the development of delinquency are similar in different times and places. To the extent that causes, theories, and interventions differ, this shows the importance of cultural and national contexts.

Cross-national delinquency comparisons are not easy, because of differences in legal definitions of offenses and in court processing. Cross-national comparable self-report surveys have many advantages (Junger-Tas et al., 1994). However, England and the United States are quite similar in definitions of offenses and in court processing (Farrington et al., 1994). There are problems in comparing different studies, because of differences in theoretical constructs studied and in the operational definition and measurement of theoretical constructs. Some

variables may be harder to measure in some times and places; for example, it is difficult to measure criminal records of biological fathers in the United States in the 1990s, partly because of the problem of establishing the identity of the biological father, and partly because of problems of getting access to records and the adequacy of records for a mobile population. Nevertheless, because of investigator overlap, the London and Pittsburgh studies have many similarities in theoretical constructs and empirical variables.

The Cambridge Study in Delinquent Development

The Cambridge Study in Delinquent Development is a prospective longitudinal survey of the development of offending and antisocial behavior in 411 London males. Table 3.2.1 summarizes key features of this project. At the time they were first contacted in 1961-62, these males were all living in a working-class inner-city area of London. The sample was chosen by taking all the boys who were then aged 8-9 and on the registers of 6 state primary schools within a one-mile radius of a research office that had been established. Hence, the most common year of birth of these males was 1953. In nearly all cases (94%), their family breadwinner at that time (usually the father) had a working-class occupation (skilled, semi-skilled or unskilled manual worker). Most of the males were Caucasian (97%) and of British origin. The study was originally directed by Donald J. West, and it has been directed since 1982 by David P.

Farrington, who has worked on it since 1969. It has been mainly funded by the British Home Office. The major results can be found in four books (West, 1969, 1982; West and Farrington, 1973, 1977), in more than 60 papers listed by Farrington and West (1990), and in a recent summary paper by Farrington (1995). These publications should be consulted for more details about the variables measured in this paper.

A major aim in this survey was to measure as many factors as possible that were alleged to be causes or correlates of offending. The males were interviewed and tested in their schools when they were aged about 8, 10, and 14, by male or female psychologists. They were interviewed in a research office at about 16, 18 and 21, and in their homes at about 25 and 32, by young male social science graduates. At all ages except 21 and 25, the aim was to interview the whole sample, and it was always possible to trace and interview a high proportion: 389 out of 410 still alive at age 18 (95%) and 378 out of 403 still alive at age 32 (94%), for example. The tests in schools measured individual characteristics such as intelligence, attainment, personality, and psychomotor impulsivity, while information was collected in the interviews about such topics as living circumstances, employment histories, relationships with females, leisure activities such as drinking and fighting, and offending behavior.

In addition to interviews and tests with the males, interviews with their parents were carried out by female social workers who visited their homes. These took place about once a

year from when the male was about 8 until when he was aged 14-15 and was in his last year of compulsory education. The primary informant was the mother, although most fathers were also seen. The parents provided details about such matters as family income, family size, their employment histories, their child-rearing practices (including attitudes, discipline, and parental disharmony), their degree of supervision of the boy, and his temporary or permanent separations from them.

The teachers completed questionnaires when the males were aged about 8, 10, 12, and 14. These furnished data about their troublesome and aggressive school behavior, their attention deficits, their school attainments and their truancy. Ratings were also obtained from their peers when they were in the primary schools, about such topics as their daring, dishonesty, troublesomeness and popularity.

Searches were also carried out in the central Criminal Record Office in London to try to locate findings of guilt of the males, of their parents, of their brothers and sisters, and (in recent years) of their wives and cohabitees. The minimum age of criminal responsibility in England is 10. The Criminal Record Office contains records of all relatively serious offenses committed in Great Britain or Ireland. In the case of 18 males who had emigrated outside Great Britain and Ireland by age 32, applications were made to search their criminal records in the 8 countries where they had settled, and searches were actually carried out in four countries. Since most males did not emigrate

until their twenties, and since the emigrants had rarely been convicted in England, it is likely that the criminal records are quite complete.

Convictions were only counted if they were for offenses normally recorded in the Criminal Record Office, thereby excluding minor crimes such as common assault, traffic infractions and drunkenness. The most common offenses included were thefts, burglaries and unauthorized takings of vehicles, although there were also quite a few offenses of violence, vandalism, fraud and drug abuse. In order not to rely on official records for information about offending, self-reports of offending were obtained from the males at every age from 14 onwards. In general, predictors and correlates of convictions were very similar to predictors and correlates of self-reported delinquency (Farrington, 1992).

This paper compares explanatory variables measured at age 8-10 with convictions between ages 10 and 16 inclusive. Hence, this is a genuinely predictive study and the age 8-10 variables could not be biased by the knowledge of who became delinquent. The recorded age of offending is the age at which an offense was committed, not the age on conviction. There can be delays of several months or even more than a year between offenses and convictions, making conviction ages different from offending ages. Offenses are defined as acts leading to convictions. Between ages 10 and 16 inclusive (the years of juvenile delinquency in England at that time), 85 males (21%) were

convicted. Altogether, up to age 40 in 1994, 164 males (40%) were convicted (Farrington et al., 1996).

The Cambridge Study in Delinquent Development has a unique combination of features:

- (a) Eight personal interviews with the males have been completed over a period of 24 years, from age 8 to age 32;
- (b) The main focus of interest is on offending;
- (c) The sample size of about 400 is large enough for many statistical analyses but small enough to permit detailed case histories of the boys and their families;
- (d) There has been a very low attrition rate, since 94% of the males still alive provided information at age 32;
- (e) Information has been obtained from multiple sources: the males, their parents, teachers, peers, and official records;
- (f) Information has been obtained about a wide variety of theoretical constructs, including intelligence, personality, parental child-rearing methods, peer delinquency, school behavior, employment success, marital stability, and so on.

The Pittsburgh Youth Study

The Pittsburgh Youth Study is a prospective longitudinal survey of the development of offending and antisocial behavior in three samples of about 500 Pittsburgh boys, totalling 1,517 boys.

At the time they were first contacted in 1987-88, random samples of first, fourth, and seventh grade boys enrolled in the City of Pittsburgh public schools were selected. At that time, 72% of all children resident in the City of Pittsburgh attended public schools. The City of Pittsburgh covers the inner city population of about 370,000 in 1990 out of the Pittsburgh-Beaver Valley Metropolitan Statistical Area of about 2,243,000 (Hoffman, 1991). Many of the assessments in the Pittsburgh Youth Study were designed to be comparable to those used in two other contemporaneous longitudinal surveys conducted in Denver, CO (Huizinga et al., 1991) and Rochester, NY (Thornberry et al., 1991).

Out of about 1,000 boys in each grade selected at random for a screening assessment, about 850 boys (85%) were actually assessed. The boys completed a self-report questionnaire about antisocial behavior and delinquency (Loeber et al., 1989), while their primary caretakers completed an extended Child Behavior Checklist (Achenbach and Edelbrock, 1983) and their teachers completed an extended Teacher Report Form (Edelbrock and Achenbach, 1984). We will refer to the primary caretaker as the mother because this was true in 94% of cases. Participants did not differ significantly from the comparable male student population in their scores on the California Achievement Test and in their ethnic composition (African American or Caucasian).

From the screening assessment, a risk score was calculated for each boy indicating how many of 21 serious antisocial acts he

had ever committed (including types of stealing, running away, firesetting, truancy, vandalism, robbery, gang fighting, attacking with a weapon, joyriding, burglary, liquor use and marijuana use). Information from all three sources was taken into account. The risk score was used to select the sample for follow-up, consisting of approximately the 250 most antisocial boys in each grade and about 250 boys randomly selected from the remaining 600. Hence, the screening sample of about 850 per grade was reduced to a follow-up sample of about 500 per grade. The 500 boys in each grade were then assessed every 6 months for three years, with data collection from the boy, the mother and the teacher on each occasion. Regular data collection from the middle sample then ceased, but the oldest and youngest sample are still (in 1996) being followed up at yearly intervals. Rolf Loeber is the principal investigator of the Pittsburgh Youth Study, with Magda Stouthamer-Loeber, Welmoet van Kammen, David P. Farrington and Benjamin B. Lahey as co-investigators. The Study has mainly been funded by the U.S. Office of Juvenile Justice and Delinquency Prevention and the U.S. National Institute of Mental Health.

For the closest comparability to the London data, the present analyses are based only on the middle sample of boys, who were aged about 10 when they were first assessed. Variables measured in the screening assessment and first follow-up 6 months later are compared with petitions to the juvenile court up to 1994. The middle follow-up sample comprises 508 boys, 259 of

whom were high risk and 249 of whom were randomly chosen from the remainder who were screened. Of the sample, 56% were African-American, 91% were living with their natural mother, and 41% were living with their natural father at the time of the first follow-up. At this time, their median age was 10.6 years, and they were then followed up in court records for 5.8 years up to a median age of 16.4 years. The Pittsburgh boys were more variable in age than the London boys, although both were grade samples. In England, advancement from one grade to the next depends on age, not an achievement; hence, children are not "held down" in inappropriate grades because of low achievement.

Table 3.2.1 shows some differences between the London and Pittsburgh samples. As already mentioned, 97% of London boys were Caucasian, compared with 44% of Pittsburgh boys. Whereas 94% of London boys were living with an acting father, this was true of only 59% of Pittsburgh boys. The London boys had more siblings (defined as other children born to their biological mothers) on average than the Pittsburgh boys (where all related siblings, including paternal half-siblings, were included). However, Pittsburgh mothers were younger at the time of the boy's birth and at the time of the birth of their first child. London homes were smaller and hence more crowded, but twice as many of the Pittsburgh families (43%, compared with 20% in London) were dependent on welfare.

As in the London Study, a major aim in the Pittsburgh Youth Study was to measure as many factors as possible that were

alleged to be causes or correlates of offending. The first follow-up was much more extensive than the screening assessment. The boys completed the Self-Reported Delinquency scale of Elliott et al. (1985), while the mothers again completed the extended Child Behavior Checklist and the teachers again completed the extended Teacher Report Form. These questionnaires yielded data not only on antisocial behavior but also on individual factors such as hyperactivity, anxiety, and shyness. In addition, the mothers completed a demographic questionnaire yielding information about adults and children living with the boy, and the Revised Diagnostic Interview Schedule for Children (DISC-P; Costello et al., 1985) that yielded child psychiatric diagnoses such as Attention-Deficit Hyperactivity Disorder. The boys completed the Recent Mood and Feelings Questionnaire (Costello and Angold, 1988) as a measure of depressed mood. Also, California Achievement Test results on reading, language, and mathematics were obtained from the schools.

Various questionnaires were used to assess parental discipline and supervision, parent-child communication, parental attitudes to child antisocial behavior, parental disharmony (where two parents were present), parental stress, parental anxiety and parental substance use. Socio-economic status was assessed using the Hollingshead (1975) index, based on parental occupational prestige and educational level. Where two parents were present, the highest score was recorded. Housing quality was assessed by the interviewer, based on such features as the

structural condition of the house and visible signs of peeling paint. Neighborhood quality was rated by the mother and also assessed from census data (e.g. on median family income, percentage unemployed, percentage separated or divorced).

In order to maximize the validity of all variables, information from different sources was combined as far as possible, as was information from the screening and first follow-up assessments. For example, the combined measure of delinquency seriousness based on mothers, boys and teachers was a better predictor of court petitions than self-reported delinquency alone (Farrington et al., 1996). Only brief descriptions of variables are included in this paper; more extensive descriptions can be found in previous papers (e.g. Loeber et al., 1989, 1991; Stouthamer-Loeber et al., 1992, 1993; Van Kammen et al., 1991). Measurement methods were better in Pittsburgh than in London, especially for family variables.

Court records were obtained from Allegheny County Juvenile Court (paper files). The City of Pittsburgh is included in and surrounded by Allegheny County, which had a population of about 1,336,000 in 1990 (Hoffman, 1991). Six boys who moved outside Allegheny County within two years were excluded from the analyses, as were 7 boys with no consent forms or incomplete records. In order to carry out a genuinely predictive analysis, 10 boys with court records before the first follow-up assessment were excluded, leaving 485 boys in the analysis who had no official record at age 10.

Detected juvenile offenders in Allegheny County may be referred to the Juvenile Court by the police or other agencies (e.g. the school board). The intake officer (in the probation department) reviews all cases and almost always meets with the alleged offender, the family, and the victim. The intake officer may dismiss or withdraw cases because of doubts about whether the offender is in fact guilty, doubts about whether there is sufficient evidence to prove that the offender is guilty, or for procedural reasons such as the victim not turning up. The intake officer may divert the offender (e.g. by giving a warning or requiring informal probation) if the case is minor or the offender is young and criminally inexperienced. If the intake officer believes that there is sufficient evidence that the juvenile is guilty, and that the case is too serious for diversion, the case will be petitioned to the Juvenile Court. We have only counted petitioned cases. Therefore, our recorded juvenile offenders are relatively serious cases where there is convincing evidence of guilt.

Offense types were coded according to the FBI UCR system. For comparability with London offenses, we included index and non-index delinquency. Non-index delinquency included simple assault, forgery, fraud, receiving stolen property, weapons offenses, vandalism, drug offenses, prostitution, statutory rape, disorderly conduct, threats and endangering, indecent assault and indecent exposure. Other offenses (e.g. liquor law violations, drunkenness, traffic offenses, violations of ordinances, status

offenses) were excluded. The London and Pittsburgh offenses leading to juvenile court delinquency records are quite comparable. Of the 485 boys in the middle sample with no court record before the follow-up assessment, 137 (28%) were petitioned afterwards. Most of these (104 out of 137) were petitioned for the index offenses of homicide, forcible rape, robbery, aggravated assault, burglary, larceny, motor vehicle theft, or arson.

The Pittsburgh Youth Study has a unique combination of features:

(a) It is a multiple-cohort accelerated longitudinal design (Bell, 1954; Farrington, 1991), although only the middle sample is studied in this paper;

(b) It contains a high-risk sample and a representative sample, thus maximizing the yield of problem boys while still permitting conclusions about the general population;

(c) Information from the males, their mothers, and their teachers was obtained every 6 months on 7 occasions for the middle sample, and data collection is continuing annually for the youngest and oldest samples 9 years after the start of the project;

(d) The main focus of interest is on offending and on child psychiatric disorders;

(e) The sample size of about 500 per grade cohort is relatively large;

(f) The multiple-cohort design means that results obtained

with one sample can be tested for replication with others;

(g) There has been a very low attrition rate from the first follow-up onwards; 94% of the follow-up sample of boys in the middle sample were interviewed in the 7th assessment;

(h) Information has been obtained about a wide variety of theoretical constructs, including individual, family, socio-economic, peer, and neighborhood measures.

Key Explanatory Variables

The London and Pittsburgh studies were not designed to test one particular theory but to test hypotheses derived from numerous theories. Major longitudinal surveys are so uncommon and so difficult to carry out that it is desirable to measure numerous theoretical constructs and outcome variables in them (e.g. not only delinquency but also substance use, sexual intercourse, etc.). The major theoretical constructs and hypotheses to be tested were derived from important theories such as the following:

(a) Cohen (1955) and Cloward and Ohlin (1960), highlighting the importance of socio-economic deprivation, low social class, low school attainment, the inability to achieve status goals, and the inability to delay gratification;

(b) Shaw and McKay (1969) and Sutherland and Cressey (1974), emphasizing the influence of criminal and

socially disorganized neighborhoods, delinquent schools, delinquent friends, and criminal parents;

- (c) Bowlby (1951) and Hirschi (1969), focussing on the importance of attachment to and separation from parents, and the strength of bonding to family and society;
- (d) Eysenck (1977) and Trasler (1962), concentrating on the importance of internal inhibitions against offending built up in a social learning process, of consistent parenting, and of anxiety as an inhibitor;
- (e) Akers (1973), Patterson (1982) and Widom (1989), focussing on the importance of differential reinforcement by parents of good and bad behavior, and of direct imitation of parental aggression;
- (f) Robins (1966), highlighting the continuity and stability of an underlying construct such as antisocial personality;
- (g) Gottfredson and Hirschi (1990), Wilson and Herrnstein (1985) and Moffitt (1990), emphasizing the importance of self-control, impulsivity and intelligence.

Most modern delinquency theories (see e.g. Hawkins, 1996) include several of these key theoretical ideas.

For many analyses in the London study, explanatory variables were dichotomized, as far as possible, into the "worst" quarter of males (e.g. the quarter with the lowest income or lowest intelligence) versus the remainder. The one-quarter/three quarters split was chosen to match the prior expectation that about one quarter of the sample would be convicted as juveniles. Because most variables were originally classified into a small number of categories (typically 3 or 4), and because fine distinctions between categories could not be made very accurately, this dichotomizing did not usually involve a great loss of information. For comparability with the London variables, the Pittsburgh scales were also dichotomized, as far as possible, into the "worst" quarter versus the remainder.

There are many advantages of dichotomized variables. First, they permit a "risk factor" approach, and also make it possible to study the cumulative effects of several risk factors. Second, they make it easy to investigate interactions between variables (which are often neglected with continuous variables because of the difficulty of studying them). Hence, they encourage a focus on types of individuals as well as on variables, permitting the investigation of relationships within different subgroups of individuals. Information about individuals is more useful for interventions than information about variables. Third, they make it possible to compare all variables directly by equating

sensitivity of measurement. Some variables are inherently dichotomous (e.g. broken family, family on welfare). In many studies, it is difficult to know whether one variable is more closely related to an outcome than another because of differential sensitivity of measurement rather than differential causal influence.

Fourth, dichotomous data permit the use of the odds ratio as a measure of strength of relationship, which has many attractions (Fleiss, 1981). It is easily understandable as the increase in risk associated with a risk factor. It is a more realistic measure of predictive efficiency than the percentage of variance explained (Rosenthal and Rubin, 1982). For example, an odds ratio of 2, doubling the risk of delinquency, might correspond to a correlation of about .12, which translates into 1.4% of the variance explained. The percentage of variance explained gives a misleading impression of weak relationships and low predictability. Unlike correlation-based measures, the odds ratio is independent of the prevalence of explanatory and outcome variables and independent of the study design (retrospective or prospective). Nevertheless, because of the mathematical relationship between the logarithm of the odds ratio and the phi correlation (Agresti, 1990, p.54), conclusions about relative strengths of associations based on odds ratios and phi correlations are similar. Also, the odds ratio emerges in logistic regression analyses as a key measure of strength of effect while controlling for other variables.

Fifth, the use of the odds ratio encourages the study of the worst affected individuals. In delinquency research, there is often more interest in predicting extreme cases (e.g. "chronic" offenders) than the whole range of variation. Some variables are non-linearly related to delinquency, with a large increase in delinquency in the most extreme category compared with the remainder. For example, in the Pittsburgh study, the percentage of boys petitioned to the juvenile court was 40.0% of those with 3 or more siblings, compared with 24.5% of those with 2 siblings, 24.5% of those with 1 sibling, and 22.4% of those with no siblings. Some variables (e.g. self-reported delinquency) often have a highly skewed distribution, causing the product-moment correlation to have a theoretical maximum value considerably below 1 and hence to give a misleadingly low impression of strength of relationship.

While dichotomization is a way of dealing with these various problems, it is often criticized because of loss of information and lower measures of association (Cohen, 1983). However, loss of information is also involved in other commonly used analytic techniques, for example combining several different aspects of parenting into one composite variable, or including only a small subset of measured variables in the analysis. The criticism of lower measures of association only has force if the product-moment (ϕ) correlation is used with dichotomous data. The use of RIOC (Relative Improvement Over Chance) or the tetrachoric correlation does not lead to a lower measure of strength of

association in comparison with product-moment correlations and continuous data. Essentially, RIOC corrects phi for its maximum possible value (Farrington and Loeber, 1989), while the tetrachoric correlation estimates what the product-moment correlation would have been between two normally distributed, interally scaled variables which were dichotomized.

There was a great deal of data reduction in London and Pittsburgh to try to produce distinct measures of a relatively small number of key theoretical constructs. The aim was to eliminate redundancy without significant loss of information. Only clearly explanatory variables were included as predictive factors. For example, peer delinquency was excluded, since it could merely be measuring the boy's own delinquency (since 76% of seriously delinquent acts in the middle sample in Pittsburgh were committed with others). Amdur (1989) pointed out that a common fault in much delinquency research is to include measures of the outcome variable as predictors. If two variables basically measure the same underlying construct, using one as a predictor of the other will artifactually increase the percentage of variance explained, but this is of little practical significance for the explanation of delinquency.

In order to avoid collinearity problems in regression analyses, we deleted variables which were highly correlated ($\phi > .40$) with other, conceptually similar variables. For example, in London, low family income was retained in preference to the father's poor job record ($\phi = .48$) and living on welfare ($\phi =$

.57), and low junior school attainment in preference to low verbal intelligence ($\phi = .48$). However, both large family size (4 or more siblings) and low family income were retained, despite their intercorrelation ($\phi = .46$), because they were judged to be distinctly different constructs. In Pittsburgh, behavior problems of the father was retained in preference to parental substance use ($\phi = .54$), age of the mother at first birth in preference to age of the mother at the birth of the boy ($\phi = .45$), and broken family (not living with two biological parents) in preference to living in a single-parent, female headed household ($\phi = .59$). However, African-American ethnicity and bad neighborhood (according to census data) were both retained ($\phi = .52$), as were African-American ethnicity and living on welfare ($\phi = .42$) and broken family and living on welfare ($\phi = .43$), because these were judged to be important and distinctly different variables.

Table 3.2.2 shows the key explanatory variables, divided into four categories: individual, child-rearing, socio-economic and parental. In general, variables were only included in Table 3.2.2 if between 15% and 35% of boys could be identified as a risk group. However, exceptions were made for some variables because of their importance (e.g. family on welfare, broken family, African-American ethnicity in Pittsburgh) and in other cases in order to obtain variables that were comparable with the other study (e.g. few friends and boy not praised in London). The Pittsburgh data could have been reweighted back to the screening

sample (but not to the original target population) by appropriate multiplication. However, reweighting was not done because, while it changed prevalence estimates, it did not change measures of association, which are the focus of this paper. Also, types of individuals cannot be studied in weighted data.

In previous analyses of the London data, variables were only included if less than 10% of the sample were missing on them. This rule could not be applied to the Pittsburgh data, because of the large number of absent fathers. Over 40% of the sample were missing on father variables (e.g. poorly educated father, unemployed father) and on variables based on two parents (e.g. disagree on discipline, unhappy parents). This difficulty did not arise with behavior problems of the father, because this variable was based on currently absent fathers as well as currently present fathers. The notes to Table 3.2.2 show that the source of this variable was the mother.

Comparable predictors of juvenile court delinquency

Table 3.2.3 shows results obtained with reasonably comparable predictors of juvenile court delinquency in London and Pittsburgh. The main measure of predictive efficiency is the odds ratio (OR). For example, 32% of 104 London boys with the highest impulsivity scores on psychomotor tests were convicted as juveniles, compared with 17% of the remaining 307 (X^2 corrected for continuity = 9.48, $p = .001$, $OR=2.3$); 33% of 82 London boys rated by teachers as lacking in concentration or restless in

class were convicted, compared with 18% of the remaining 328 assessed ($X^2 = 8.37$, $p = .002$, $OR=2.3$). One-tailed statistical tests are used for chi-squared because all the predictors are directional; the test of significance of the OR, based on its confidence interval, is two-tailed. In Pittsburgh, 40% of 88 boys who were the most hyperactive (according to mothers and teachers) were petitioned to the juvenile court, compared with 26% of the remaining 397 ($X^2 = 6.37$, $p = .006$, $OR=1.9$); 38% of 117 boys with the highest scores on Attention Deficit Hyperactivity Disorder (on the DISC-P, rated by mothers) were petitioned, compared with 25% of the remaining 368 ($X^2 = 6.07$, $p = .007$, $OR=1.8$). Hence, measures of hyperactivity or impulsivity predicted court delinquency in London and Pittsburgh.

Similarly, measures of low junior school attainment in London (from school records) significantly predicted delinquency, as did low achievement in Pittsburgh (measured by the California Achievement Test). However, the measures of nervous boy and shy-withdrawn in London (based on mothers) and of anxious boy and shy-withdrawn in Pittsburgh (both derived from mothers and teachers) did not predict delinquency. Nor did having few or no friends (rated by mothers in London and by mothers and boys in Pittsburgh). Similarly, not attending church in London (according to mothers) and low participation in religious services in Pittsburgh (according to boys) did not predict court delinquency.

Generally, child-rearing measures were based on mother

reports in London and on questionnaires completed by mothers and boys in Pittsburgh. Poor parental supervision significantly predicted delinquency in London (OR=2.2) and Pittsburgh (OR=2.0). In Pittsburgh, the main measure of parental discipline was whether the mother used physical punishment (hitting, slapping or spanking the boy). This did not predict delinquency. The most comparable variable in London was a combined measure of harsh or erratic discipline and cruel or neglecting attitude of the mother, and a harsh or neglecting mother significantly predicted the boy's delinquency (OR=3.3).

In London, boys who were not praised or rewarded for being good were not particularly likely to become delinquent (OR=1.4). In Pittsburgh, low parental reward or reinforcement for the boy's positive behavior had a slightly higher OR and was marginally predictive (OR=1.5, $p = .033$). In London, boys who spent most of their leisure time outside the home (according to a questionnaire completed by mothers) were significantly likely to become delinquents (OR=2.1). However, in Pittsburgh, boys who were not involved in family activities were not significantly likely to become delinquents (OR=1.4). In London, parental disharmony at age 8 (chronic disagreement or raging conflicts between the parents) significantly predicted the boy's delinquency (OR=2.6). Similarly, in Pittsburgh, unhappiness between the parents at age 10 significantly predicted the boy's delinquency (OR=2.3).

Turning to socioeconomic factors, low socio-economic status (a rating of 5) than was separation from a parent in London (OR=

2•4).occupational prestige of the family breadwinner based on the Registrar General's scale) did not significantly predict delinquency in London. This could be because the Registrar General's scale did not realistically reflect differences in social standing. For example, dockers and printers had high social status in London at the time, because they were relatively well paid, but these blue-collar occupations ranked lower on the Registrar General's scale than more poorly paid white-collar occupations such as bank clerks. In Pittsburgh, the Hollingshead (1975) index of socio-economic status was used, which reflects not only occupational prestige but also the educational level of the parents. Low SES on this index significantly predicted the boy's delinquency (OR=2.5).

Low family income in London significantly predicted delinquency (OR=2.6) as did the family being on welfare in Pittsburgh (OR=3.2). Poor housing in London (dilapidated or slum conditions) weakly predicted delinquency (OR=1.9), but the relationship was not significant in Pittsburgh (OR=1.4). Living in a relatively small home (3 or fewer rooms in London, 5 or fewer rooms in Pittsburgh) did not predict delinquency in either London or Pittsburgh. In London, separation of a boy from a parent (for reasons other than death or hospitalization) significantly predicted delinquency (OR=2.4). Similarly, in Pittsburgh, living in a broken family (not living with both biological parents) significantly predicted delinquency (OR=3.5).

A convicted parent (usually the father) strongly predicted

delinquency in London (OR=4.0). Similarly, in Pittsburgh, a father with a history of behavior problems was predictive, although less strongly (OR=1.9). A mother who was relatively young at the time of her first birth (less than 20 in London, less than 18 in Pittsburgh) predicted delinquency in both studies, but relatively weakly. In London, nervousness of the mother was based on mother reports, evidence of psychiatric treatment (received by 21% of mothers by the boy's age 8), and a Health Questionnaire completed by mothers. This was a marginal predictor of delinquency (OR=1.6). In Pittsburgh, boys were considered to have an anxious parent if either their mother or their father had sought help for anxiety, depression or suicidal problems, but this variable did not predict the boy's delinquency. Finally, large family size (4 or more siblings in London, 3 or more siblings in Pittsburgh) significantly predicted delinquency in both studies.

These variables are not all closely comparable. Nevertheless, the agreement between London and Pittsburgh results is quite impressive. Based on the odds ratio, 9 of the 12 significant predictors in London were also significant in Pittsburgh, and 7 of the 9 non-significant predictors in London were also non-significant in Pittsburgh. Out of 21 comparisons, there were only two large discrepancies. First, harsh maternal discipline significantly predicted delinquency in London (OR=3.3), but maternal physical punishment was not predictive in Pittsburgh (OR=1.2). Second, low SES significantly predicted

delinquency in Pittsburgh (OR= 2.5) but not in London (OR= 1.5).

There were four smaller discrepancies. The boy spending his leisure time outside the home predicted delinquency in London (OR=2.1), but his low involvement in family activities was not predictive in Pittsburgh. Poor housing was more strongly related to delinquency in London (OR=1.9) than Pittsburgh (OR= 1.4), and a convicted parent was more predictive in London (OR= 4.0) than the father's behavior problems in Pittsburgh (OR= 1.9). Finally, a broken family was more strongly predictive in Pittsburgh (OR=3.5) than was separation from a parent in London (OR=2.4).

Non-comparable predictors of juvenile court delinquency

Quite a number of variables measured in London had no directly comparable variable measured in Pittsburgh, and vice-versa. Identifying these variables has implications for measurement. For example, if a London variable, not measured in Pittsburgh, proved to be an important predictor of delinquency, one implication is that this variable should be measured in Pittsburgh. Table 3.2.4 shows the extent to which these non-comparable variables predicted delinquency.

In London, high daring (adventurousness or taking many risks, rated by peers and parents) was a strong predictor of delinquency (OR=4.2). In Pittsburgh, lack of guilt was a strong predictor (OR=3.8). Low non-verbal IQ (90 or less on the Progressive Matrices) predicted delinquency in London (OR=2.3). Unpopularity in London (rated by peers) was a weak predictor of

delinquency (OR=1.7), while in Pittsburgh depressed mood was not a significant predictor.

In London, fathers with harsh attitude and discipline tended to have delinquent sons (OR=2.5), as did parents who expressed authoritarian and punitive child-rearing attitudes on a questionnaire (OR=2.1) and fathers who did not join in their sons' leisure activities (OR=1.9). In Pittsburgh, poor communication between the boy and his parents (e.g. not telling them about his problems) was a weak predictor of delinquency (OR=1.5). However, the boy reporting that he did not feel close to his mother, and disagreement between the parents on disciplining the boy, were not significant predictors.

In London, having a mother who stayed home and did not work outside the home was not a predictor of delinquency. However, going to a high-delinquency-rate secondary school at age 11 was a significant predictor (OR=2.6). In Pittsburgh, a poor employment record of the mother (unemployed for at least 26 weeks in the previous year) was a weak predictor of delinquency (OR=1.7), while a comparably poor employment record of the father had a similar OR but was not statistically significant (OR=1.6), mainly because of the smaller numbers (42% of fathers missing on this variable). Also, information from the mother about the father's unemployment may have been inaccurate. For the mother variable, home-makers were not coded as unemployed. Living in a bad neighborhood in Pittsburgh, according to either mother reports (OR=1.8) or census data (OR=2.0), significantly predicted the

boy's delinquency. Finally, in Pittsburgh, African-American boys were significantly likely to be petitioned to the juvenile court (OR=3.4). As already mentioned, 97% of the London boys were Caucasian; 7 of the 12 Afro-Caribbean males in London were convicted as juveniles.

In London, ratings of the nervousness of the father were based on mother reports and evidence of psychiatric treatment (received by 11% of fathers by the boy's age 8). However, this variable did not predict the boy's delinquency. In Pittsburgh, the mother's antisocial attitude (e.g. approving the boy's fighting and truancy) and her perceived stress were not significant predictors. However, a poor education (not reaching grade 12) of the mother (OR=2.7) and the father (OR=2.5) both predicted the boy's delinquency.

Multivariate analyses

In order to provide some indication about how far the predictors of delinquency were independently important in each study, regression analyses were carried out. Strictly speaking, logistic regression analysis should be carried out with dichotomous data. However, the major problem with logistic regression is that a case that is missing on any one variable has to be deleted from the whole analysis, causing a considerable loss of data. As already mentioned, missing data was especially a problem in Pittsburgh, because there were so many absent fathers. Fortunately, with dichotomous data, ordinary least

squares (OLS) regression produces very similar results to logistic regression (Cleary and Angel, 1984), and indeed the results obtained by the two methods are mathematically related (Schlesselman, 1982, p.245). Missing data are not such a problem with OLS regression, because missing cases can be deleted variable by variable, thereby using as much of the data as possible. Hence, OLS regression analyses were used in the paper.

Hierarchical regression analyses were carried out.

Generally, it was expected that child-rearing factors (e.g. poor supervision) would cause individual factors (e.g. high daring) rather than the reverse, that socio-economic factors (e.g. low family income) would cause child-rearing factors (e.g. poor supervision) rather than the reverse, and that parental factors (e.g. young mother) would cause socio-economic factors (e.g. low family income) rather than the reverse. There is a surprising degree of consensus among longitudinal researchers (e.g. Rutter, 1981; Larzelere and Patterson, 1990) and contextual researchers (e.g. Simcha-Fagan and Schwartz, 1986; Gottfredson et al., 1991) that neighborhood and socio-economic factors have indirect effects on delinquency via their affects on child-rearing and individual factors. African-American ethnicity was to be entered last in any regression analysis, because it could not be caused (changed) by any other factor. Other causal orders are of course possible. For example, socio-economic factors could influence parental factors rather than the reverse, and non-individual factors may have direct effects on delinquency rather than

indirect effects via individual ones. An empirical justification for the causal ordering is presented later, and direct and indirect effects are investigated in regression analyses.

In predicting court delinquency, the block of individual factors were entered first, then the block of child-rearing factors, then the block of socio-economic factors, and then the block of parental factors. In Pittsburgh, African-American ethnicity was entered last. The order of the blocks was based on theoretical ideas about the most likely direction of causal influence, but these ideas were also tested empirically. We adopted a regression approach rather than a path analysis technique (e.g. LISREL) because we wanted our results to be empirically rather than theoretically driven, as far as possible, and because we wanted to include a large number of important variables in the analysis simultaneously. Causal modelling techniques typically show that one particular postulated model, including a small subset of variables, it is not significantly different from the data, but we wanted to derive what was demonstrably the best possible model.

Table 3.2.5 shows the results of the regression analyses. Because we wanted to establish the independent effects of the explanatory variables, forward stepwise regression was used, with no backward elimination of variables. The multiple R's are misleadingly low because of the use of dichotomous variables, and also lower than in other projects because measures of the outcome variable (e.g. peer delinquency) were excluded as predictors.

The best predictors of delinquency -- high daring and lack of guilt -- are measuring different constructs from delinquency. High daring (taking many risks) and lack of guilt are not necessarily linked to delinquency in the way that peer delinquency is. These analyses are particularly useful in indicating which explanatory variables are important independently of other explanatory variables, and more attention should be paid to the independently important variables than to the multiple R's (which indicate relative rather than absolute predictive efficiency). We have focussed on F changes rather than beta weights because the beta weights are so sensitive to the intercorrelations between the particular variables included in the model (Gordon, 1968).

In our empirical approach, all four blocks of variables were tested one by one as predictors of court delinquency. In both London and Pittsburgh, the individual variables proved to be the best predictors, as measured both by the best single predictor (high daring in London and lack of guilt in Pittsburgh) and by the multiple R's (London: individual .36, child-rearing .29, socio-economic .25, parental .30. Pittsburgh: individual .35, child-rearing .21, socio-economic .31, parental .28). These results justified entering the individual variables as the most proximate influences on delinquency. The best predictors were high daring, low school achievement, low non-verbal intelligence, and unpopularity in London; and lack of guilt, low achievement, and low anxiety in Pittsburgh.

The remaining three blocks of variables (child-rearing, socio-economic and parental) were then tested one by one as predictors of the best single predictor of delinquency (high daring in London and lack of guilt in Pittsburgh). In both London and Pittsburgh, child-rearing variables proved to be the best predictors, as measured both by the best single predictor (poor supervision in London and poor communication in Pittsburgh) and by the multiple R's (London: child-rearing .27, socio-economic .22, parental .22; Pittsburgh: child-rearing .33, socio-economic .26, parental .25). These results justified entering the child-rearing variables as the most proximate influences on the best single individual predictor at least. Table 3.2.6 shows that the best predictors of high daring in London were poor supervision, harsh paternal discipline and the boy spending leisure time outside the home, while the best predictors of lack of guilt in Pittsburgh were poor family communication, unhappy parents and maternal physical punishment.

In the prediction of delinquency, the block of child-rearing variables was then entered after the significant individual variables. Table 3.2.5 shows that the most important independent child-rearing predictors were harsh maternal discipline and authoritarian parental attitudes in London; and unhappy parents and poor supervision in Pittsburgh. The results of these regression analyses might be interpreted as showing direct and indirect influences on delinquency. For example, in London, harsh maternal discipline and authoritarian parents had direct

influences (independently of the individual variables), whereas poor supervision and harsh paternal discipline had indirect influences (because they influenced daring, which in turn influenced delinquency).

These results might be used to construct a large path diagram of influences on delinquency. However, as blocks of variables are added, this path diagram becomes increasingly complex. For example, Table 3.2.6 shows that, both in London and Pittsburgh, the best predictors of the individual factor of low achievement were socio-economic variables. Attending a high delinquency rate school in London is to some extent a similar type of variable (contextual) to living in a bad neighborhood in Pittsburgh, while low family income in London is a similar variable to family on welfare in Pittsburgh.

Table 3.2.6 also shows the results of regression analyses investigating the best predictors of the most important independent child-rearing predictors of delinquency (in Table 3.2.5): harsh maternal discipline and authoritarian parents in London, and unhappy parents and poor supervision in Pittsburgh. The socio-economic variables were the best predictors of authoritarian parents and poor supervision, while the parental variables were the best predictors of unhappy parents. Socio-economic and parental variables were about equally important in predicting harsh maternal discipline. These results were not clear-cut in indicating that either socio-economic or parental variables were the more proximate influences on child-rearing.

However, theoretically, we thought that it was more likely (and more in accord with the actual time-ordering) that parental factors influenced socio-economic factors than the reverse. Therefore, the socio-economic block of variables was entered next in the equation predicting delinquency.

Table 3.2.5 shows that, in London, separation from a parent predicted delinquency independently of individual and child-rearing factors. Similarly, in Pittsburgh, a broken family was an independent predictor, as was the family on welfare. Table 3.2.6 shows that the best parental predictors of separation from a parent in London were a convicted parent and a young mother. Similarly, the best parental predictors of a broken family in Pittsburgh were the father's behavior problems and a young mother (as well as parental anxiety or depression). The best parental predictors of the family being on welfare in Pittsburgh were a young mother, the father's behavior problems, and a poorly educated mother and father.

Finally, Table 3.2.5 shows that, over and above the most important individual, child-rearing and socio-economic predictors, a convicted parent was an independent predictor of delinquency in London. Similarly, a poorly educated mother and father were independent predictors of delinquency in Pittsburgh. Also, African-American ethnicity predicted delinquency independently of all other variables in Pittsburgh. However, the fact that this result was only just significant ($p = .04$, one-tailed), suggests that almost all of the linkage between African

American ethnicity and delinquency operates through, and can be explained by, the other measured variables in this study. The remainder of the linkage might possibly be explained by unmeasured variables.

These successive regression analyses basically suggest how causal influences on delinquency might operate. Both in London and Pittsburgh, the most important proximal influence is an individual factor reflecting low internal inhibition or self-control, and this individual factor is especially predicted by child-rearing methods. Hence, these results agree with a theory attributing the development of delinquency primarily to the failure to build up internal inhibitions in a social learning process, because of inadequate child-rearing methods.

However, the results also show that certain child-rearing methods predict delinquency directly, independently of individual factors, as does the important socio-economic factor of a broken family, and parental characteristics such as convictions and poor education. Other influences on delinquency operate indirectly through more proximal variables. For example, a young mother primarily predicts delinquency because it tends to be a precursor of a broken family, which in turn leads to delinquency. Hence, successive regression analyses empirically reveal patterns of causal influences.

Additional analyses

In order to investigate whether the results would be any

different using hierarchical logistic regression analyses, these are summarized in Table 3.2.7. Generally, the most significant predictors in the OLS analyses were replicated in the logistic analyses. In London, the OLS results were very closely replicated, despite the loss of cases. Seven of the 8 significant predictors in the OLS analyses also emerged in the logistic analyses; the only difference was that low intelligence in the OLS analyses was replaced by not having few friends in the logistic analyses. In Pittsburgh, only 6 of the 10 significant predictors in the OLS analyses also emerged in the logistic analyses. Whereas having few friends seemed to be a protective factor in London, it was positively related to delinquency in Pittsburgh. However, as already explained, there was a severe loss of cases in the Pittsburgh logistic analyses; two-thirds in one analysis (down to N=178). For example, family on welfare was almost certainly insignificant in Pittsburgh because most of the families on welfare were missing from the analysis, because they had absent fathers. For all the reasons specified above, we believe that the results obtained in the OLS regressions are the most valid.

Cohen and Cohen (1983) have argued that hierarchical multiple regression analysis should be carried out in the reverse order to the one we have used; that is, with the most distal variables entering the equation first and the most proximal last. Two main arguments are advanced in favor of this ordering. One is that hierarchical multiple regression measures direct effects

of variables entered last (independently of variables already in the equation) and both direct and indirect effects of variables entered first (since all other variables are not in the equation). Entering variables in the reverse order makes it possible to measure direct effects of proximal variables and direct and indirect effects of distal variables.

The second argument is that successive hierarchical regression analyses can indicate indirect effects of more distal variables. For example, if variable A had a significant weighting (Beta value) by itself in an equation predicting delinquency, but a non-significant weighting in an equation along with other variables, this might indicate that variable A had an indirect effect on delinquency that was mediated through those other variables. Unfortunately, an alternative hypothesis is that the significant weighting of variable A disappeared because it was intercorrelated with one of the other variables (i.e. both were essentially measuring the same underlying construct).

Gordon (1968) showed how the weighting of any variable depended on the number of other similar variables in a multiple regression analysis. This is one of the reasons why we have focussed on F changes in stepwise regression rather than Beta values.

As an exercise, we investigated the effects of carrying out the hierarchical regression analyses in the reverse order, and the results are shown in Table 3.2.8. In London, two parental variables (a convicted parent and large family size) independently predicted delinquency. Similarly, three socio-

economic variables (separated from parent, high delinquency school, and low family income) independently predicted delinquency. When all these five parental and socio-economic variables were then included in the equation, large family size and a high delinquency school were no longer independent predictors. There was no obvious tendency for the weightings (Beta values) of the parental variables to decrease more than those of the socio-economic variables. This either means that parental variables do not have indirect effects on delinquency via socio-economic variables (as assumed in our model) or that reductions in Beta values indicating indirect effects are counteracted by increases in Beta values consequential upon the use of fewer indicator variables in a conceptual block.

When the four significant child-rearing variables were added to the equation, only three variables were independently predictive, and again there were no obvious decreases in weightings. Similarly, when the three significant individual variables were added, five variables were independently predictive of delinquency (a convicted parent, harsh maternal discipline, authoritarian parents, high daring, and low achievement). Comparing these results with those shown in Table 3.2.5, these were five of the seven most important variables in Table 3.2.5 (all except low intelligence and separation from a parent). Consequently, the results obtained with the reverse hierarchical regressions were similar to those obtained previously.

Similar conclusions can be drawn from the Pittsburgh analyses. Eight variables were independently important in the reverse hierarchical regressions (African American ethnicity, poorly educated father and mother, broken family, unhappy parents, lack of guilt, low achievement and low anxiety). These were 8 of the 10 most important variables in Table 3.2.5 (all except poor supervision and family on welfare). There was no obvious tendency for the previous regression analyses to overestimate the importance of individual variables.

Conclusions

This is the first systematic comparison of the extent to which a large number of different risk factors are predictive of delinquency in two different countries. The definition and measurement of delinquency was similar in both countries. Several risk factors were identified as replicable predictors of delinquency over time and place (London in the early 1960s and Pittsburgh in the late 1980s). The most important were: Hyperactivity, impulsivity and poor concentration; low school attainment; poor parental supervision; parental conflict; an antisocial parent; a young mother; large family size; low family income; and coming from a broken family. These effects must be quite robust to show up clearly in dichotomous data.

Several results were also replicated in regression analyses. The most important proximate predictors of delinquency were variables measuring low internal inhibition and low school

attainment, and a broken family was an important independent predictor of delinquency in both London and Pittsburgh. Child-rearing methods had the most important influences on low internal inhibition; and socio-economic factors had the most important influences on low school attainment. A broken family was predicted by a young mother and an antisocial parent.

The differences between London and Pittsburgh can also be illuminating. Such differences could be attributable to many possible causes, including differences over time, differences between cultures, different operational definitions of theoretical constructs, different meanings of (theoretical constructs underlying) empirical variables, different causal mechanisms, and different samples. The use of the odds ratio meant that differences in strength of relationships could not be attributable to differences in prevalence. The major observed differences concerned maternal physical punishment, the boy spending leisure time outside the home, poor housing, a convicted parent (stronger predictors of delinquency in London) and low SES and a broken family (stronger predictors in Pittsburgh).

Maternal physical punishment was defined differently in London, because it included a cold, rejecting attitude. It is possible that physical punishment in Pittsburgh was sometimes given in the context of a loving relationship. There was no sign of any effect of physical punishment in Pittsburgh even when it was divided into three roughly equal categories (26.3%, 27.7%, and 30.3% delinquent, respectively). Similarly, the boy spending

leisure time outside the home in London may be a different variable than the boy's low involvement in family activities in Pittsburgh. Spending leisure time outside the home may be conducive to peer influence, whereas low involvement in family activities may sometimes indicate a withdrawn personality.

Poor housing may have been a stronger predictor in London because housing conditions there in the early 1960s were objectively worse than in Pittsburgh in the late 1980s. Poor housing in London was an indicator of dilapidated slum housing, often earmarked for demolition in later slum clearance schemes. (For a graphic description of the London area, and changes in it since the 1960s, see Farrington and West, 1995.) Similarly, a convicted parent may have been a stronger predictor in London than the father's behavior problems in Pittsburgh because a conviction indicated a more antisocial individual.

Low SES may have been a stronger predictor of delinquency in Pittsburgh because it reflected parental education as well as occupation; a poorly educated father and mother were strong predictors of delinquency in Pittsburgh. Alternatively, the range of variability of SES may have been greater in Pittsburgh, because the sample was representative of the city rather than being drawn from one small area (as in London). A broken family may have been a stronger predictor in Pittsburgh than separation in London because a broken family indicated a permanent break, whereas separation included temporary breaks.

Comparisons over time and place highlight changes over time

and place. For example, fathers were much more likely to be absent and mothers were more likely to be full-time workers in Pittsburgh in the late 1980s than in London in the early 1960s. Family size was greater in London, and the size of homes was less. It is interesting that most predictors were replicable despite these changes. An important theoretical issue is whether absolute or relative values of variables are important; for example, is it only family sizes greater than a certain absolute value that are criminogenic (e.g. because of the diffusion of the mother's attention over several children), or are relatively large families criminogenic irrespective of the absolute family size? The replicability of results suggests that relative values are most important. Systematic comparisons over time and place may be useful not only in establishing replicable results but also in throwing light on theoretical issues of this kind.

These results are not fully explainable by any existing theory of the development of delinquency. They are least compatible with classic theories that emphasize the importance of low social class (e.g. Cohen, 1955; Cloward and Ohlin, 1960) and criminal neighborhoods (e.g. Shaw and McKay, 1969), but this may be because of the restricted variability of these factors in inner-city samples. They are most compatible with classic theories that emphasize the importance of individual factors such as low self-control and impulsivity (e.g. Wilson and Herrnstein, 1985; Gottfredson and Hirschi, 1990), the importance of child-rearing methods in building up internal inhibitions against

offending (e.g. Trasler, 1962; Patterson et al., 1992), and the importance of attachment to and separation from parents (e.g. Bowlby, 1951). The challenge to criminologists is to devise more complex theories that can explain all the linkages between delinquency and the individual, child-rearing, socio-economic and parental factors included in more comprehensive longitudinal surveys such as the two described here.



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Table 3.2.1: Key Features of London and Pittsburgh Studies

London	Pittsburgh
411 boys	508 boys
Single cohort	Middle cohort of three
97% Caucasian	44% Caucasian
Small inner-city area of London	City of Pittsburgh
First studied in Year 4	First studied in 4th grade
Age 8-9 in 1961-1962	Age 10-11 in 1987-1988
All boys in 6 state primary schools	Random sample of public schools
Complete population	259 high risk, 249 low risk
Data from boy, mother, teacher, peers, records	Data from boy, mother, teacher, records
Individual, family, peer, school constructs	Individual, family, peer, neighborhood constructs
Initial data from all boys and 95% of mothers	Initial data from 86% of boys and mothers
8 interviews at 3 year intervals up to age 32	7 interviews at 6 month intervals up to age 14
94% interviewed in last wave	94% interviewed in last wave
Court records of convictions age 10-16	Court records of petitions age 10-16
21% convicted	28% petitioned
94% living with acting father at age 8-9	59% living with acting father at age 10-11
40% have 3 or more siblings	26% have 3 or more siblings
Average age of mother at boy's birth = 27.5	Average age of mother at boy's birth = 23.7
Average age of mother at first birth = 23.3	Average age of mother at first birth = 19.9
51% living in 4 or fewer rooms*	24% living in 5 or fewer rooms*
20% on welfare	43% on welfare

* London figures excluded bathrooms; 32% of boys had no fixed bath in their home.

Table 3.2.2: Key Explanatory Variables Measured in London and Pittsburgh Studies

London (N=411)			Pittsburgh (N=485)		
Individual	%H	%M	Individual	%H	%M
Low non-verbal intelligence (B)	25	0	Low achievement (R)	25	4
Low school achievement (T)	23	6	Hyperactive (MT)	19	0
High daring (MP)	30	1	High attention deficit (M)	24	0
Lacks concentration or restless (T)	20	0	Lacks guilt (MT)	30	13
High psychomotor impulsivity (B)	25	0	High anxiety (MT)	30	0
High nervousness (M)	24	7	Shy or withdrawn (MT)	30	0
Shy or withdrawn (M)	22	7	Few friends (BM)	29	3
Few friends (M)	12	5	Depressed mood (B)	23	1
Unpopular (P)	32	4	High religiosity (B)	21	27
Regular church attender (M)	19	14			
Child-Rearing			Child-Rearing		
Poor supervision (M)	19	7	Poor supervision (BM)	28	2
Harsh maternal discipline (M)	16	7	Physical punishment by mother (BM)	36	1
Harsh paternal discipline (M)	21	11	Low parental reinforcement (BM)	26	1
Authoritarian parental attitude (M)	24	27	Poor family communication (BM)	25	1
Boy not praised (M)	12	12	Boy not involved (BM)	30	1
Boy's leisure outside home (M)	17	19	Boy not close to mother (B)	18	2
Father doesn't join in (M)	28	27	Disagree on discipline (BM)	24	44
Parental conflict (M)	24	9	Unhappy parents (M)	31	41

Table 3.2.2 (continued)

London (N=411)			Pittsburgh (N=485)		
Socio-economic	%H	%M	Socio-economic	%H	%M
Low SES (M)	19	0	Low SES (M)	25	2
Low family income (M)	23	0	Family on welfare (M)	43	7
Mother at home (M)	30	5	Unemployed father (M)	22	42
Poor housing (I)	33	0	Unemployed mother (M)	27	10
3 or fewer rooms (M)	19	6	Poor housing (I)	23	5
Separated from parent (M)	22	0	5 or fewer rooms (M)	24	3
High delinquency school (R)	21	10	Broken family (M)	61	3
			Bad neighborhood (M)	24	1
			Bad neighborhood (C)	26	8
Parental			Parental		
Convicted parent (R)	27	0	Father behavior problems (M)	18	8
Young mother (<20) (MR)	22	0	Mother antisocial attitude (M)	24	1
Nervous mother (M)	32	6	Young mother (<18) (M)	28	10
Nervous father (M)	22	10	Anxious parent (M)	27	0
4 or more siblings (MR)	24	0	High maternal stress (M)	23	1
			Poorly educated mother (M)	27	3
			Poorly educated father (M)	23	43
			3 or more siblings (M)	26	0
			Ethnicity		
			African American (M)	56	0

Notes: B=boy, M=mother, F=father, T=teacher, P=peer, R=record, I=interviewer, C=Census

%H = % in high risk category

%M = % missing

TABLE 3.2.3
Comparable Predictors of Juvenile Court Delinquency

London			Pittsburgh		
Individual	OR	p	Individual	OR	p
High psychomotor impulsivity	2.3*	.001	Hyperactive	1.9*	.006
Lacks concentration or restless	2.3*	.002	High attention deficit	1.8*	.007
Low school achievement	2.6*	.0004	Low achievement	2.2*	.0005
High nervousness	1.0	NS	High anxiety	0.8	NS
Shy or withdrawn	0.8	NS	Shy or withdrawn	1.2	NS
Few friends	0.6	NS	Few friends	1.2	NS
Regular church attender	0.7	NS	High religiosity	1.0	NS
Child Rearing			Child-Rearing		
Poor supervision	2.2*	.005	Poor supervision	2.0*	.0008
Harsh maternal discipline	3.3*	.0001	Maternal physical punishment	1.2	NS
Boy not praised	1.4	NS	Low parental reinforcement	1.5	.033
Leisure outside home	2.1*	.017	Boy not involved	1.4	NS
Parental conflict	2.6*	.0005	Unhappy parents	2.3*	.003
Socio-economic			Socio-economic		
Low SES	1.5	NS	Low SES	2.5*	.0001
Low family income	2.6*	.0002	Family on welfare	3.2*	.0001
Poor housing	1.9*	.009	Poor housing	1.4	NS
Small home	0.8	NS	Small home	1.5	NS
Separated from parent	2.4*	.0007	Broken family	3.5*	.0001

Table 3.2.3 continued

Parental			Parental		
Convicted parent	4.0*	.0001	Father behavior problems	1.9*	.007
Young mother	1.6	.05	Young mother	1.8*	.006
Nervous mother	1.6	.05	Anxious parent	0.9	NS
Large family size	2.5*	.0003	Large family size	2.1*	.0005

Notes:

OR = Odds Ratio (* = significant)
 p values (one-tailed) from chi-squared (NS = not significant)

TABLE 3.2.4
Noncomparable Predictors of Juvenile Court Delinquency

London			Pittsburgh		
Individual	OR	p	Individual	OR	p
Low non-verbal intelligence	2.3*	.0008	Lacks guilt	3.8*	.0001
High daring	4.2*	.0001	Depressed mood	1.2	NS
Unpopular	1.7	.036			
Child-Rearing			Child-Rearing		
Harsh paternal discipline	2.5*	.001	Poor family communication	1.5	.036
Authoritarian parental attitude	2.1*	.014	Boy not close to mother	1.2	NS
Father doesn't join in	1.9*	.031	Disagree on discipline	1.3	NS
Socio-economic			Socio-economic		
Mother at home	1.4	NS	Unemployed father	1.6	NS
High delinquency school	2.6*	.0005	Unemployed mother	1.7*	.014
			Bad neighborhood (M)	1.8*	.005
			Bad neighborhood (C)	2.0*	.002
Parental			Parental		
Nervous father	1.3	NS	Mother antisocial attitude	1.2	NS
			High maternal stress	1.2	NS
			Poorly educated mother	2.7*	.0001
			Poorly educated father	2.5*	.001
			Ethnicity		
			African American	3.4*	.0001

Notes: OR = Odds Ratio (* = significant). M = Mother. C = Census.

p values (one-tailed) from chi-squared (NS = not significant)

TABLE 3.2.5

Hierarchical Regression Analyses for Juvenile Court Delinquency

London	F change	p	Pittsburgh	F change	p
Individual (.36)			Individual (.35)		
High daring	29.66	.0001	Lacks guilt	29.41	.0001
Low achievement	10.33	.0007	Low achievement	10.66	.0006
Low intelligence	4.81	.015	Low anxiety	3.24	.04
Unpopular	2.20	.07			
Child-Rearing (.40)			Child-Rearing (.38)		
Harsh maternal discipline	6.22	.007	Unhappy parents	3.53	.03
Authoritarian parents	2.44	.06	Poor supervision	2.09	.07
Socio-Economic (.41)			Socio-Economic (.43)		
Separated from parent	3.11	.04	Family on welfare	9.01	.002
			Broken family	4.00	.02
Parental (.45)			Parental (.45)		
Convicted parent	10.30	.0008	Poorly educated mother	4.11	.02
			Poorly educated father	2.14	.07
			Ethnicity (.46)		
			African-American	3.08	.04

Notes: p values one-tailed because of directional predictions. Multiple R values in parentheses.

TABLE 3.2.6
Hierarchical Regression Analyses for Intermediate Outcomes

London	F change	p	Pittsburgh	F change	p
High Daring			Lacks Guilt		
(Child-Rearing)	(.27)		(Child-Rearing)	(.33)	
Poor supervision	14.16	.0001	Poor communication	13.95	.0001
Harsh paternal discipline	3.03	.04	Unhappy parents	9.77	.001
Leisure outside home	2.22	.07	Maternal physical punishment	4.79	.01
Low achievement			Low achievement		
(Socio-economic)	(.36)		(Socio-economic)	(.29)	
Delinquent school	38.90	.0001	Family on welfare	11.67	.0004
Low family income	8.56	.002	Bad neighborhood (C)	4.19	.02
Mother at home	2.23	.07	Low SES	3.70	.03
			Poor housing	3.22	.04
Harsh Maternal Discipline			Unhappy Parents		
(Parental)	(.16)		(Parental)	(.34)	
Nervous mother	8.96	.002	Maternal stress	30.68	.0001
(Socio-economic)	(.15)		Poorly educated mother	2.56	.06
Poor housing	8.06	.002			
Authoritarian Parents			Poor Supervision		
(Socio-economic)	(.27)		(Socio-economic)	(.24)	

Table 3.2.6 Continued

Low family income	17.69	.0001	Family on welfare	15.85	.0001
Low SES	3.59	.03			
Separated from Parent			Broken Family		
(Parental) (.30)			(Parental) (.45)		
Convicted parent	28.16	.0001	Father behavior problems	46.78	.0001
Young mother	7.29	.004	Young mother	10.81	.0006
			Anxious parent	5.54	.01
			Family on Welfare		
			(Parental) (.44)		
			Young mother	26.65	.0001
			Poorly educated father	17.14	.0001
			Father behavior problems	8.35	.002
			Poorly educated mother	6.82	.005

Notes: p values one-tailed because of directional predictions. Multiple R values in parentheses. C = Census.

TABLE 3.2.7

Logistic Regression Analyses for Juvenile Court Delinquency

London	LRCS change	p	Pittsburgh	LRCS change	p
Individual (319)			Individual (299)		
High daring	26.25	.0001	Lacks guilt	18.44	
Unpopular	10.71	.0006	Low achievement	9.97	.0001
Not few friends	4.81	.014	Few friends	3.44	
Low achievement	2.39	.06	Low anxiety	3.53	.0008
					.03
					.03
Child-Rearing (226)			Child-Rearing (231)		
Harsh maternal discipline	3.86	.025	Unhappy parents	3.93	.02
Authoritarian parents	3.14	.038	Not close to mother	3.02	.04
Socio-Economic (244)			Socio-Economic (178)		
Separated from parent	2.56	.055	Broken family	3.43	.03
			Bad neighborhood (C)	2.07	.07
			Low SES	2.15	.07
Parental (256)			Parental (212)		
Convicted parent	6.13	.007	Mother antisocial attitude	2.15	.07
			Poorly educated mother	1.82	.09
			Large family size	2.17	.07

Notes:

LRCS = Likelihood Ratio Chi-Squared. p values one-tailed because of directional predictions. N's in parentheses. C = Census.

Alternative Hierarchical Regression Analyses

	Beta Values			
	Single	PS	PSC	PSCI
London				
<u>Parental</u>				
Convicted parent	.250	.230	.267	.217
Large family size	.112	—		
<u>Socio-economic</u>				
Separated from parent	.120	.080	—	
High delinquency school	.120	—		
Low family income	.117	.107	—	
<u>Child-rearing</u>				
Harsh maternal discipline	.168		.186	.151
Harsh paternal discipline	.117		—	
Authoritarian parents	.102		.115	.097
Leisure outside home	.096		—	
<u>Individual</u>				
High daring	.279			.225
Low achievement	.136			.115
Low intelligence	.118			—
Pittsburgh				
<u>Parental</u>				
African American	.233	.174	.158	.129
Poorly educated father	.133	.133	.122	.106
Poorly educated mother	.127	.108	.110	.121
Large family size	.094	.100	.093	—
<u>Socio-economic</u>				
Family on welfare	.157	—		
Broken family	.148	.158	.168	.125
Low SES	.109	—		
<u>Child-rearing</u>				
Unhappy parents	.150		.141	.112
Poor supervision	.124		—	
<u>Individual</u>				
Lacks guilt	.272			.197
Low achievement	.179			.104
Low anxiety	.095			.106

Notes

Single = Single block of variables entered in regression.

P = Parental, S = Socio-economic, C = Child-rearing, I = Individual.

Beta values only shown if $p < .05$, one-tailed.

3.3 PREDICTORS OF EARLY VS. LATE ONSET VIOLENCE

Quanwu Zhang and Rolf Loeber

Two themes in delinquency are currently much discussed, violence and early- and late-onset age of offending, but the relation between the two aspects of delinquency are not clearly understood. Are there two distinct groups of early and late age-of-onset violent individuals? And are predictors of early-onset violence different from predictors of late-onset violence? And are these different from the predictors of persistent violence?

Although major progress has been made in the study of juvenile criminal violence during the past decade (Elliott, 1994; Eron et al., 1987; Farrington, 1991), some crucial issues remain unclear. Whereas much is known about the relationship between delinquency and age (Farrington, 1986), there are few studies that have documented the relationship for violence and age. Moreover, most violence research has been cross-sectional or, when longitudinal, has relied on few assessments, or on official records only. As a result, it is still difficult to grasp what the age of onset curves for violence look like, and understand the extent to which they may vary with ethnicity. This is all the more important because of the preponderance of violence by African-American juveniles (Elliott, 1994).

A noticeable exception is the work by Elliott (1994), showing that the hazard rates of violence onset for African-

American and Caucasian males both had a sharp elevation at age 12, and peaked at ages 15 and 16, respectively. By age 18, nearly 40% of the African-American males and 30% of the Caucasian males had committed at least one violent offense.

Moffitt (1993) has argued to make a distinction between early, life-course persistent (showing "tenacious stability across time and in diverse circumstances") and adolescent-limited delinquents (characterized by an onset and desistance of delinquency during adolescence). The implication is that two groups of delinquent juveniles are distinguishable in population samples. The issue is to what extent prevalence curves of serious violence would be bimodal indicating the emergence of the two groups, with most of the violent individual having an early onset of violence, and fewer a later onset. A test of Moffitt's conceptualization (Nagin et al., 1995) actually showed that a proportion of the adolescent-limited group tended to persist in drug and alcohol abuse and violent acts (see Loeber, 1988, for other studies to this effect). These findings imply that a bimodal distribution is not likely. However, since Nagin et al.'s (1995) study was based on official records only, it remains to be seen whether the Moffitt conceptualization equally or, perhaps better, apply to self-reports of violent acts.

Also implicated in Moffitt's (1993) conceptualization is that predictors of early onset delinquents, including early-onset violent individuals, are different than the predictors of late onset delinquency or violence. Criminological theories in

general have not addressed the causes of early-onset delinquency, whether violent or of another type. Instead, most criminological theories have been rather developmental (Le Blanc & Loeber, 1993).

From a social learning perspective, we expect that conditions that foster early-onset violence (i.e., not later than age 13) are a combination of individual and social factors. We conceptualize that the following individual factors may play a role in the emergence of violence at an early age: highly impulsive and overactive behaviors (as for example captured by the diagnosis of Attention Deficit-Hyperactivity Disorder. Research also has shown that many aggressive boys have attention problems (Hinshaw, 1992), and are academically poor performers. A second individual factor is lack of guilt. This is based on the fact that most highly aggressive boys lack empathy for their victims, appear callous, and do rarely show regret about the harm they inflict on others. A third individual factor that we want to emphasize is the presence of a high degree of internalizing problems, such as anxiety, depressed mood, and shy/withdrawn behaviors. Research on clinical populations of delinquents shows that many of them have co-occurring or comorbid externalizing and internalizing problems (Hodgins, 1995). It is unclear, however, to what extent the presence of internalizing problems adds to the explanation of externalizing problems such as violence.

Turning to social factors, we see peer and parental behaviors as pivotal in shaping boys' violence. As to peer

behaviors, however, it is important to obtain measures independent from the boys' violence. Since most violence is among peers, it is crucial to avoid confounds, particularly when boys are the only informants about the peer behavior. For that reason, we can not include boys' exposure to peer violence, since a portion of such exposure inevitably is the results of the boys' own violence. Instead, we need to focus on more indirect measures of peer influences, such as social isolation (as expressed by boys' having few friends) which often is associated with aggressive behaviors by perpetrators.

A rich literature has documented parents' child rearing practices that are associated with aggression in boys (Loeber & Stouthamer-Loeber, 1986; Patterson, 1982). Particularly, parents who are inconsistent in their disciplining are more likely to have aggressive children, whereas also the administration of repeated physical punishment is known to be associated with violence in the offspring (Loeber et al., 1996). In addition, we postulate that a low degree of positive parenting, poor supervision, and poor parent-child communication are predictive of juvenile violence.

Finally, there are several background variables that are thought to be associated with juvenile violence, including as mentioned ethnicity, but also low socio-economic class, and disadvantaged neighborhood (Loeber & Wikström, 1993).

This paper addresses many of the issues raised above, and specifically asks answers to the following questions:

1) Are the hazard rates for violence similar to those for African-American and Caucasian male juveniles reported by Elliott (1994) in his national sample?

2) Which factors best predict the onset of violence prior to age 13? And are those factors different from predictors of the onset of violence onset between ages 14 and 18, and different from correlates of violence by and after age 13?

3) How stable is violence?

Answers from the questions will be based on analyses of four years of follow-up data from 506 inner-city boys in the oldest sample of the Pittsburgh Youth Study, who were first studied in grade 10.

Methods

Participants. Data were collected as part of the Pittsburgh Youth Study which consisted of 1,517 male public school students of three grade samples -- youngest, middle, and oldest, first sampled as the first, fourth, and seventh graders. The sampling frame covered all the male students attended those three grades of the city public schools of 1987-88. In the initial screening assessment, information on the boys' antisocial behavior was collected from the boys and their caretakers and teachers. A risk score was calculated based on 21 serious antisocial behaviors. Using this risk score, a sample for follow-up was selected, consisting of the 250 most antisocial youngsters in each grade, plus an equal number of boys randomly selected from

the remainder. Detailed sampling procedure was documented by Loeber, Stouthamer-Loeber, van Kammen, and Farrington (1991).

Only data from Phases S through G of the oldest sample were used ($n = 506$ at the inception of this study). The average age of this sample in the beginning of the study was 12; 43% of the boys at that time lived with their mothers alone; 58% of the boys came from African-American families; and about 40% of the caretakers received public assistance. The demographic information on this subject group has been reported in detail by Van Kammen, Loeber and Stouthamer-Loeber (1991).

Boys were interviewed every six months after the initial screening. Training (one week) was required for all the new interviewers in the beginning of each data collection phase. Interrater reliability was systematically calculated and used in the training process. Participant retention rates for the oldest sample ranged from .95 to .86 for the between Phases B through G. Seven assessment phases from S through G were included as the oldest sample was not interviewed at Phase F, due to a shift from a half-yearly to a yearly assessment schedule.

Although the participants were initially sampled disproportionately based on their risk scores, we did not apply the weighting system to the present study. First, since the composition of the sample might slightly differ from one phase to another, inappropriate weighting might introduce more unwanted contamination than it could offer. Second, since the present study was model-based, factors contributing to delinquency had

been incorporated and thus the need for weights had been taken care of (Hoem, 1985). Third, based on previous studies using this data set, no differences were found between those which used weighting and those which did not (see Loeber et al., 1996). Thus, being on the conservative side, we decided not to use uniform weights across different measurement phases.

Measures

Age of violence onset after age 13 Four behaviors were selected from a 36-item instrument of self-reported delinquency (SRD) which was based on the National Youth Survey developed by Elliott and his colleagues (Elliott, Huizinga, & Ageton, 1985). These behaviors were gang fight, aggravated assault or murder, robbery, and rape. The inclusion of gang fight in the measure was to take into account the serious violence often elicited by or associated with gang fighting among youth. At the initial assessment phase, boys were asked to report retrospectively whether and when they had ever committed each of the offenses and also to recall whether and how many times each behavior had occurred within last six months. At the later prospective stages, each assessment covered a six-month period, and the number of offenses was recorded. The age of violence onset was dated by the time of first occurrence of any one of the four offenses after age 13. A variable of ever-occurrence of these offenses was also imputed before age 14, labelled as earlier onset.

Predictors The predictors were classified into three groups: child, family, and social class variables. This classification roughly corresponded to Bronfenbrenner's (1979) taxonomy of developmental ecology. Data collected either at the screening phase (S), the first follow-up (Phase A), or their combined were to be used so as to establish a temporal order between the violence onset and the predictors.

In the child domain, seven variables were included. They were depression, anxiety, shy/withdrawn, hyperactivity/impulsivity/attention-deficit (HIA), lack of guilt, number of friends, and academic achievement. Self-reported depression was measured at Phase A using the Short Form of Mood and Feelings (Angold et al., 1992). Boys were asked to respond to 13 statements as "not true", "sometimes true", or "true". These statements were, for example, "you felt so tired that you just sat around and did nothing", "you cried a lot", and "you thought that nobody loved you." The alpha coefficient for the construct was .82.

The 9-item anxiety and 7-item shy/withdrawn measures were based on the answers at Phases S and A on the Child Behavior Checklist (CBCL) (adapted from Achenbach and Edelbrock, 1983) by the boys and their primary caretakers and teachers. The items were scaled as "not true", "sometimes true", or "very true". The anxiety items were, for example, "clings to adults or too dependent", "fears he might think or do something bad", and "nervous, highstrung or tense". The shy/withdrawn items were,

for example, "feels others are out to get him", "get teased a lot", and "likes to be alone". Information was first combined over the caretaker and teacher's ratings. A case was identified as positive, if any of the two sources reported sometimes true or very true on an item at either Phase S or A. A total score was then calculated by summing up the positive endorsements across all the items. The reliability was .69 for anxiety and .57 for shy/withdrawn.

Boys' *HIA* scores, based on Farrington et al. (1990), were also made up of 14 CBCL items from their primary caretakers and teachers such as "can't sit still", "talks out of turn", "wants to have things right away", and "inattentive, easily distracted". The total scores were calculated the same way as the above. The reliability for this scale was .86.

Boys' *lack of guilt* was a construct with a single CBCL item reported by boys' primary caretakers and teachers. A boy's caretaker and teacher were asked to respond whether the boy felt guilty after misbehaving. The average test-retest reliability was .46 across the first five assessment waves.

Boys' *academic achievement* was measured at Phase S using the math, reading, and language subset of the California Achievement Test (CAT). The total score was computed by first taking the mean of the subtests a boy had taken, and then multiplied that mean by 3. The average test-retest reliability was about .90.

The *number of close friends* was an indicator of peer influence which included two items reported by boys themselves

and their caretakers. The respondents were asked twice in different ways about how many close friends the boy had. The answers were scaled from zero to three, and a high number stood for fewer friends. The construct score was calculated by summing up the caretaker and boy's reporting. The average test-retest reliability was .42 across the first four assessment waves.

To facilitate interpretation and identify individual cases, all the above measures of boys' mental health were dichotomized at approximately the 75 percentile.

In the family domain, variables included were inconsistent discipline, poor supervision, positive parenting, parent-child communication, and physical punishment.

Inconsistent discipline included four parallel items answered by the boys and their primary caretakers. The items were for a caretaker, for example, "if you have told your son that he is grounded for a period of time as a punishment, would he be let off before the time is up", and "if a punishment has been decided upon, can you son change it by explanations, arguments, or excuses". The respondents were asked to endorse either "almost never", "sometimes", "almost always", or "not applicable". The reliability for the construct was .59.

Poor supervision consisted of four parallel questions for the boys and their caretakers. These questions for the boys were, for example, "if your parent(s) are not home, do you leave a note for them or call them about where you are going", and "do your parent(s) know who you are with when you are away from

home". The responses were scaled as "almost never", "sometimes", or "almost always". The reliability for the construct was .75.

Positive parenting contained 7 questions answered by the boys concerning the mother and the father's reactions to what the boys had done. These questions were, for example, "when you have done something that your parents like or approve of, how often does your mother/father..., give you a wink or smile, or mention it to someone else". The boys were asked to respond to the mother question and the father question separately. The two sets of answers were averaged for within each pair of the responses, and a total score was then calculated. The reliability for the construct was .83.

Poor parent-child communication was made up of 30 parental and 28 child questions. The questions for the caretakers were, for example, "can you discuss your beliefs with your son without feeling restrained or embarrassed" and "if your son is upset, is it difficult for you to figure out whether he is angry, sad, scared or what". The answers were scaled as "almost never", "sometimes", or "almost always". The reliability for the construct was .91.

Physical punishment was a single-item construct based on the boys and their caretakers' report. Both the child and his caretaker was asked whether the parent(s) had slapped or spank the boy with something. The answers were scaled as "almost never", "sometimes", or "often". The test-retest reliability was .42 across four assessments.

In the domain of social class, the variables of *ethnicity*, *SES*, and *neighborhood* were included. The respective socioeconomic statuses of male and female head(s) of a household were computed separately based on the caretaker information. Using Hollingshead's (1975) coding scheme, the raw codes of occupations were scaled into 9 ranked categories. Each female and male SES was computed as a weighted sum of the Hollingshead's occupational scale score multiplied by 5 and the years of education multiplied by 3. The total score was combined of the male and female SESs if the boy was living with both parents; otherwise, his family SES was assigned either with the score of the male or the female caretaker, depending on who the boy lived with. Family SES had a mean of 36.6, with a minimum of 6 and maximum of 67. The neighborhood measure was based on the 1990's census information.

Analyses

Prediction of the time to a violence onset after age 13 was analyzed with proportional hazard and logistic regression models. The earlier onset was used as a covariate in controlling for the left-censoring in the data as well as a predictor. The two modes of predictions had different implications. The logistic regression was to examine whether violence onset was associated with the predictors measured earlier, regardless when the onset had occurred. The proportional hazard model was to estimate the contributions of the predictors to the timing of the onset, by

which we were to see which of the predictors were associated with a faster onset.

The stability of violence was investigated using repeated measures analysis with random effects. When the recurrence of violence was measured at each assessment, the observations of the repeated measures were not independent. In addition, missing data in the longitudinal data collection were inevitable. The missing values could not only cause information loss with the deletion of the cases, but also lead to biased estimates since the cases with greater amount of missing values tended to be those who possessed greater criminality. By using the categorical mixed effects (fixed and random effects) model, the dependability would be taken into account, and the remaining information of those cases with missing data would still be preserved and utilized in the model estimation. The prevalence of violence at each assessment phase from S through G was used as the dependent variable. The computer program MIXOR written by Hedeker (1993) was used, assuming the underlying distribution of the prevalence measures was logistic.

Results

Hazard Rates. To verify the reliability and validity of our measures, which were obtained by using similar assessment instruments, we first compared our findings with Elliott's (1994) report. Our data were collected between the spring of 1987 and the fall of 1991, which fell in the same time window as the

National Youth Survey (1976-1993). We found that the hazard rates of violence onset for the African American and Caucasian males started to have a steady increase at ages 10 and 11, respectively, and they both reached their peak at age 14 (see Figure 3.3.1). These ages of turning points in violence initiation and the peak time were between 1-2 years earlier than in the Elliott's sample. A continuous declining for the African American boys occurred after age 13, and lasted till age 17. A dramatic rise of violence onset at age 18 probably could be attributed to sampling fluctuation, since the risk set at that age contained only nine cases, and among which 4 initiated a violent offense.

The cumulative probability of violence onset for the African American and Caucasian boys arose at a greater speed between ages 11 and 16 compared with the other ages (see Figure 3.3.1). By age 18, 50% of African American and 34% of Caucasian boys had had at least one violent offense. These rates were higher than the estimates by Elliott (1994). The hazard rate for the African American boys was substantially higher than for the Caucasian boys between ages 12 and 16. The black-to-white ratio of ever-prevalence before age 18 was 5 to 3.5, which was close to the ratio of 5 to 4 found by Elliott (1994). Similar to his findings, the two survival curves between the African American and Caucasian boys differed significantly (Wilcoxon $\chi^2 = 6.55$, $p = .01$). In addition, we found that over 70% of African American and 55% of Caucasian boys among the total violent offenders in

our oldest sample initiated their violent offenses after age 13.

In general, our onset curves were very similar to the curves presented by Elliott (1994). The differences in the ages of turning points, peak times, and ever-prevalence rates of violent offenses could be attributed to the inclusion of gang fight in our measure of violence. Confirming Elliott's (1994) findings, our results showed no effect of SES on the hazard rates of violence onset.

Prediction of the onset of violence after age 13. The proportional hazard model yielded four significant predictors of the time to the onset of violence after age 13. Boys with an anxiety score in the top quartile in the first assessment year were twice as fast as those in the first three quartiles to initiate violent offenses between ages 14-18 ($\beta = .68, p = .01$). Lack of guilt feelings after misbehaving in the first assessment year was also a significant sign of faster violence onset during ages 14-18 ($\beta = .55, p = .03$). The magnitude of the effect associated with lack of guilt was about the same as the magnitude by which the time to onset after age 13 was influenced by two types of family practice. The results indicated that inconsistent discipline and physical punishment used by parents earlier significantly increased the speed of violence onset after age 13 (β 's = .58 and .53, and p 's = .009 and .04, respectively). Noticeably, none of the three social class variables had a significant influence on the speed of violence onset after age 13, when individual characteristics and child-rearing practice

were present. These results differed from the results from the above life-table method, in which ethnicity was a classification variable.

Earlier initiation of violent offenses before age 14 was a significant factor contributing to a faster onset after age 13 ($\beta = .77, p = .001$). The entering of earlier onset into the equation had some impact on the overall pattern of the findings, and altered the magnitudes of these effects found above to some extent (see Table 3.3.1). These changes resulted a significantly better fit of the model ($\chi^2_{(1)} = 9.547, p < .001$). Specifically, when the ever-occurrence of violent offenses before age 14 was controlled for as an independent predictor, the effect size of anxiety became larger ($\beta = .75, p = .005$), the effect of lack of guilt remained the same, and the two family effects were reduced to some extent (β 's = .47 and .45, and p 's = .04 and .07, respectively). The increase of the effect size of anxiety suggested a suppressing effect of an earlier onset, when it was not controlled for in the first model estimation.

Taking out the time dimension, the logistic regression model found two additional effects on ever-occurrence of violence after age 13 (see Table 3.3.1). A comparison between the results of the proportional hazard and logistic regression models suggested that factors contributing to the speed of violence onset belonged to the larger set of factors which was associated with the ever-occurrence of violence. The effect size tended to be larger in predicting the ever-prevalence than in the model for predicting

the time to an onset. In addition, depression ($\beta = .73$, $p = .02$) and hyperactivity/impulsivity/attention-deficit ($\beta = .79$, $p = .03$) played a significant role in the occurrence of violent behavior, but not in the timing of the violence onset.

The findings of the logistic model contained further information in explaining the mechanism underlying violent behavior after age 13. Table 3.3.1 indicated that although it had only a marginal significance, being among the boys with a score in the top 25 percent on the California Achievement Test in the first assessment year reduced the chance of violence onset by a half (odds ratio = .51, $p = .08$). This effect size was similar to the one of depression, but functioned as a protective factor. Another marginally significant protective factor was shy/withdrawn behavior (odds ratio = .53, and $p = .09$).

Correlates of ever-prevalence of violence by and after age 13. Since the explanatory variables were not measured before age 13, correlates for the earlier onset of violence had no predictive implications. However, a comparison between the retrospective correlates and prospective predictors could be informative about the consistency of the effects of the individual, family, or social-contextual characteristics on violence across time span. A categorical variable was formed by coding an onset before or at age 13 but not after as 1, an onset after but not before or at age 13 as 2, onsets both before and after age 13 as 3, and no onsets as 4. These four groups could have been estimated separately, however, the estimators in the

separate-fitting approach were less efficient than in a simultaneous estimation (Agresti, 1990). Thus, a generalized logit model was specified using the no onset group as the reference category. In this approach, the three logit models for the combinations of ever-occurrence before or after age 13 were fitted simultaneously. This simultaneous fitting method enabled us to achieve a parsimonious understanding whether a boy's association with any one of the three groups could be explained by distinctive patterns of these individual, family, and social-contextual characteristics. As correlates of the onset classification could take different values for each onset group in the generalized logit model, rather than being constant across the onset groups.

The four groups had 47, 91, 53, and 234 cases each from group 1 to group 4, respectively. Overall ANOVA showed that significant correlates for the three onset groups combined were anxiety ($\chi^2_{(3)} = 7.78$), lack of guilt ($\chi^2_{(3)} = 9.26$), inconsistent discipline ($\chi^2_{(3)} = 9.93$), and physical punishment ($\chi^2_{(3)} = 7.43$). Univariate tests for each onset group indicated that, with group four used as the reference class, correlates of violence onset differed among the three classification groups (as shown in Table 3.3.2). Physical punishment ($\beta = -.45$) was the only significant correlate of the earlier onset group. Since the estimate was associated with the first category of the variable of physical punishment, this result indicated that not using physical punishment was associated with lower probability of a violence

onset before or at age 13. In other words, physical punishment used by parents increased the likelihood of violence by age 13.

While child-rearing practice contributed to the likelihood of earlier violence onset, the effects of individual characteristics were more salient in their associations with violence onset after age 13. Hyperactivity/impulsivity/attention-deficit ($\beta = -.50$) and lack of guilt ($\beta = -.51$) both increased the probability of initiation of violent offenses after age 13, whereas high academic achievement decreased that probability.

Since child-rearing practice correlated with an earlier onset while individual characteristics correlated with a later onset, those who committed at least one violent offense both before and after age 13 were expected to carry both individual and family characteristics which might induce violence. The fifth column of Table 3.3.2 showed that those who committed violent offenses both by and after age 13 were characterized as more depressed, lack of guilt feelings, more likely to be subject to parental physical abuse or inconsistent disciplinary rules. As the three groups of boys were formed mutually exclusive, the estimates of the vector β_3 provided independent validation of the estimates of the vectors of β_1 and β_2 .

Stability of violence. We found that once a boy was involved in violence, he was over eight times more likely to commit violent offenses again on the average across the four assessment years, compared to his fellow boys who did not involve in violence at the first place. Thus, when we study on the

correlates and predictors of the initiation of violent offenses, it is imperative for us to also go after the mechanism that sustain violent behavior once a boy has involved in it.

Variables from the above analyses were selected to form our specifications of repeated measures models with random effects. A series of models were tested, the results of the last three of them were presented in Table 3.3.3.

To predict stability of violence, the prevalence of violence at each assessment phase was used as the repeated dependent measures. Two sets of parameter estimates were essential in explaining stability: (a) time trends -- linear or non-linear; and (b) the interaction terms of explanatory variables by time. The time trends portrayed how fast violent behavior increased or decreased over time, and the interaction effects indicated to what extent the increase or decrease was facilitated or suppressed by individual, family, or social-contextual influences.

Comparing the three models, the choice was apparently between Models 1 and 3. Model 2 fitted the data considerably worse ($\chi^2_{(2)} = 253$ and $\chi^2_{(3)} = 264$) than the other two models. All the three models indicated a U-shaped increasing trend of violence prevalence over time, as suggested by the positive quadratic time effect. Model 1 suggested that the linear time trend was moderated by the factors of few friends ($\beta = -.10$) and family disciplinary practice ($\beta = -.10$). As time went by, boys with fewer friends tended to have a decreasing chance of

committing violent offenses. The negative interaction effect of inconsistent discipline by time, however, had a different story, when we took into consideration the high likelihood of violent offending at the first assessment phase ($\beta = 1.01$). These two effects of inconsistent discipline (the simple and the interaction effects) combined suggested that boys living in a family environment in which the parent(s) carried inconsistent disciplinary practice tended to have a higher rate of earlier violent offending, yet the rate of offenses decreased with time. Since it is difficult to detect any interaction effects in observational studies due to inherent design features relative to an experimental design (McClelland & Judd, 1993), the probability of significance tests ought to be relaxed for the interaction effects. Thus, we considered an effect with probability below .1 as significant, granted that it was an arbitrary criterion.

Model 3 provided an alternative interpretation for the stability of violence. By specifying the linear time effect as random, the two interaction effects were both eliminated. Instead, the random time effect ($\beta = .32$, $p < .001$) averaging across individuals was highly significant. The finding indicated that there was significant variability between boys in the individual intercept and linear time trend. These individualistic trends could not be explained by the interaction terms specified in an ordinary fixed-effects model, as that model specification could only treat the time effect as a constant parameter. However, when individualistic changes over time were

specified in the model, the population estimates of the interaction effects found in model 1 were explained away. This change of result patterns indicated that the estimates at the population level of the interaction effects were inadequate in explaining the mechanism sustaining the stability of violence. Testing the difference in model fitting between Models 1 and 3 indicated that the data clearly favored the specification of Model 3 ($\chi^2_{(2)} = 11.7, p < .003$).

Discussion

The study had several limitations. The onset of violence was best measured prospectively in the study from age 13 onward, while the onset of earlier violence was limited to retrospective reports. Also, predictors of violence best applied to factors measured from age 13 onward. Factors associated with earlier onset of violence inherently were more restricted than the predictors in this study. The results apply to inner-city boys, and do not generalize to violence in rural samples.

With these caveats in mind, the following are the major findings:

- * The stability of violence was high: boys who were initially violent were eight times more likely to be violent later compared to the risk of initially nonviolent boys becoming violent later.
- * The onset of violence in males already accelerated between ages 11 and 16; the rate of onset was higher for African-

American compared to Caucasian boys.

- * Predictors of the onset of violence in males after age 13 were a high anxiety score, lack of guilt feelings, inconsistent discipline by the parent, and physical punishment by the parent.
- * Among the best correlates of "ever" onset of violence in males were depressed mood and the presence of hyperactivity (3.3).
- * Protective effects for violence in males were a high score on achievement tests, and to a lesser extent, shy/withdrawn behavior.

At some later point we plan to replicate the findings against the data from the youngest sample in the Pittsburgh Youth Study, who were followed up prospectively from grade 1 onward. However, they are currently 15 years old, and only a continued follow-up will allow us to examine factors influencing their violence during late adolescence and early adulthood when violence often peaks.

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Table 3.3.1: Prediction of violence onset

Predictors	<u>Proportional hazard</u>				<u>Logistic regression</u>			
	β	χ^2	p	risk ratio	β	χ^2	p	odds ratio
Depression	.35	1.97	.160	1.42	.73*	5.16	.023	2.08
Anxiety	.68*	6.48	.011	1.97	.80*	5.11	.024	2.23
Shy-withdrawn	-.33	1.49	.222	.72	-.63	3.11	.078	.53
IMP	.40	2.21	.137	1.49	.79*	4.44	.035	2.21
Lack of guilt	.55*	4.64	.031	1.73	1.03*	9.46	.002	2.81
Few friends	-.29	1.39	.237	.75	-.31	1.03	.310	.73
Achievement	-.34	1.09	.296	.71	-.69	3.36	.067	.50
Inconsistent discipline	.58*	6.71	.009	1.79	.82*	7.78	.005	2.28
Poor supervision	-.17	.40	.527	.84	-.09	.06	.803	.91
Positive parenting	.23	.85	.357	1.26	.31	.95	.330	1.37
Physical punishment	.53*	4.37	.036	1.70	.64*	3.58	.058	1.90
Poor P-C communication	-.08	.08	.776	.92	.12	.11	.739	1.13
Bad neighborhood	.22	.75	.384	1.25	.22	.34	.517	1.25
African American	.23	.68	.409	1.26	.42	1.47	.225	1.52
Low SES	.02	.00	.940	1.02	.23	.55	.459	1.2

Table 3.3.2: Estimates of the generalized logit model for the classifications of onset groups

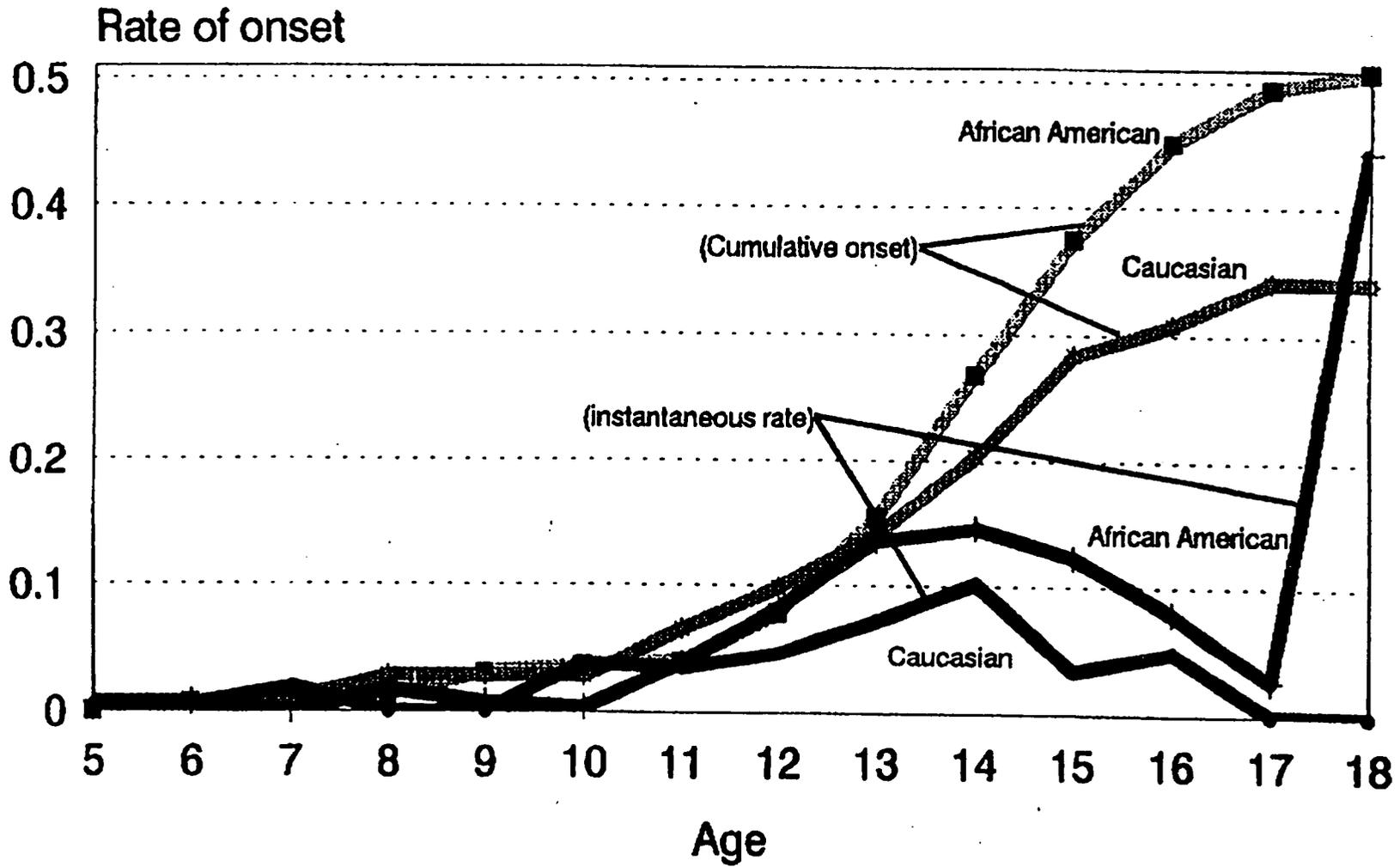
Explanatory variables	Onset before 14		Onset after 13		Before and after	
	β_1	p	β_2	p	β_3	p
Intercept	-1.64	.002	-.21	.568	-.94	.047
Depression	.11	.671	-.24	.221	-.53*	.020
Anxiety	.51	.101	-.39	.065	-.19	.448
Shy-withdrawn	-.06	.806	.26	.215	.42	.114
HIA	-.32	.273	-.50*	.039	-.46	.094
Lack of guilt	.07	.808	-.51*	.009	-.48*	.055
Few friends	-.12	.542	.15	.422	.10	.657
Achievement	.23	.348	.48*	.045	.22	.412
Inconsistent discipline	-.14	.527	-.31	.083	-.63*	.003
Poor supervision	-.35	.146	-.13	.522	.18	.495
Positive parenting	.11	.658	-.34	.061	.35	.232
Physical punishment	-.45*	.059	-.30	.154	-.54*	.023
Poor P-C communication	.01	.977	.06	.776	-.26	.286
Bad neighborhood	.01	.977	-.05	.811	-.32	.178
African American	-.22	.363	-.31	.315	-.12	.264
Low SES	.16	.496	-.22	.213	.21	.393

Note: The sign of the coefficients are associated with the lower category of each explanatory variable, e.g., 0 of physical punishment.

Table 3.3.3: Prediction of stability of violence -- estimates of random effects models

Variables	Model 1		Model 2		Model 3	
	β_1	p	β_2	p	β_3	p
Fixed effects:						
Intercept	-7.29	.000	-6.97	.000	-7.36	.000
Time	-.02	.796	-.01	.906	-.16	.284
Time x time	.06	.000	.07	.000	.04	.012
Depression	.90	.000	.92	.000	.96	.001
Lack of guilt	.17	.622	----	----	.14	.703
HIA	1.39	.000	1.43	.000	1.40	.000
Few friends	.10	.726	-.06	.800	.12	.692
Inconsistent						
discipline	1.01	.000	.98	.000	1.02	.001
African American	.90	.000	.75	.000	.96	.000
Lack of guilt						
by time	.03	.617	----	----	.05	.574
HIA by time	-.08	.185	-.10	.079	-.04	.670
Friends by time	-.10	.088	-.05	.358	-.12	.139
Discipline						
by time	-.10	.059	-.11	.022	-.09	.243
Random effects:						
Intercept	1.51	.000	1.43	.000	1.67	.000
Time	----	----	----	----	.32	.000
Log likelihood	-902.860		-1029.236		-897.010	

Figure 3.3.1
Hazard rate of violence onset



3.4 RELATIONSHIP BETWEEN VICTIMIZATION AND CARRYING A HIDDEN GUN IN YOUNG URBAN MALES

Welmoet B. van Kammen and Rolf Loeber

In recent years, the proliferation of hand guns among juveniles in the U.S. has become more and more a central issue to the problem of juvenile crime. A recent study examining gun-related violence among high school students in large cities in the United States (Sheley et al., 1992) showed that 1 in 3 males and 1 in 10 females carried a gun to high school. Although this does not mean that these youngsters carry concealed guns all the time, the rates are alarming.

Although the problem of gun carrying is more prolific in inner-cities and among African Americans, it is in no way confined to these populations. Guns in the hands of youngsters is common in suburban areas and in the Caucasian population as well (Shelley and Brewer, 1995; Sheley, 1994; Sheley and Wright, 1993).

Juveniles report carrying guns in a variety of circumstances; they use guns in the commission of crimes, when they travel in unfamiliar areas, when they are out at night, and when they feel a need for self-protection (Sheley and Brewster, 1995). Firearms, especially in the hands of impulsive young people, are extremely dangerous. Fights that may in the past have been settled by using fists, or at worst sticks or bats, now

turn quickly deadly because of the presence of guns. The increased access to guns has been linked to the increased number of juveniles being threatened, injured, and even killed by guns in the hands of other juveniles (Fingerhut et al., 1992; Webster et al., 1993)

The relationship between juvenile delinquency and victimization of offenders has been well established (Esbensen and Huizinga, 1991). Often the perpetrator has the same age and delinquency profile as the victim. Being victimized, as well as carrying a gun, has been associated with such activities as dealing drugs, gang involvement, and violent crimes (Callahan et al., 1993). In other words, the victim is not always an innocent bystander.

Relatively little is known about the temporal order of carrying a gun and being victimized. According to one hypothesis, boys' victimization increases their desire to protect themselves, thus increasing the likelihood of the victims carrying a concealed weapon such as a gun. An alternate hypothesis is that carrying a gun may increase the likelihood of being victimized. Cross-sectional studies have looked at the relationship between guns, delinquency, and victimization in young populations. The following is one of the first reports that looks at this issue from a longitudinal perspective. This report addresses the following questions:

1. What are the prevalence rates of carrying a gun and being victimized in young urban males and do these rates increase

with age?

2. How strongly are carrying a gun and victimization related independently of various forms of serious delinquency?

3. Does victimization predict carrying a gun later, and to what extent is carrying a gun a predictor of later victimization?

Methods

Participants. For our analyses, we used three assessments of the oldest sample of the Pittsburgh Youth Study (PHYS), when participants were, on average 17, 18 and 19 years old. The reason for using three years was that we only started to collect information on victimization from age 17 onwards. Victimization included reports of being threatened or having something stolen by another person with a weapon in the previous year. We eliminated reports of boys having been beaten up.

Whether a participant carried a gun was derived from a question whether he had carried a concealed gun in the previous year. Thus, youngsters who had carried gun for sporting reasons only, were excluded. In examining the relationship between victimization and gun carrying, we included in our analyses five variables that appear closely related with the issue.

a. Violent delinquency included crimes against other persons, such as attacking a person with the intent of seriously hurting that person or taking something from a person by using force.

b. Dealing drugs.

c. Being a member of a gang.

d. Living in a bad neighborhood which was a variable based on the census tract information with participants who lived in the worst tracts scoring positive on this variable. This comprised about 20% of the sample.

e. Ethnicity. The sample was 57% African American and 43% Caucasian.

Results

Figure 3.4.1 shows the percent of boys at ages 17, 18, and 19 who reported carrying a gun and the percent of boys who reported having been victimized (weighted in order to correct for the over sampling of high-risk participants). The prevalence of gun carrying increased from 6.3% at age 17 to 14.7% at age 19. In contrast, the yearly prevalence of victimization remained stable at about 10% over these years.

As mentioned earlier, both carrying a gun and victimization are associated with serious delinquency and several other factors. To explore this in our data set, we first used cross-sectional data to run cross-sectional logistic regressions for each of the three years with carrying a gun as the dependent variable. We put serious delinquency, drug dealing, being a member of a gang, neighborhood, and ethnicity in the equation first followed by victimization to determine whether victimization was significantly associated with carrying a gun independently of the other variables.

The results shown in Table 3.4.1 show that the following factors were significantly associated with gun carrying at each of the three ages: boys' prior commission of violent delinquency and their drug dealing. For example, violent crime increased the odds of gun carrying by a factor of 6 to 7. Gang membership was significantly associated with carrying a gun in two of the three years. Victimization was significantly associated with gun carrying in two of the three years after the other independent variables were controlled for. In contrast, African-American ethnicity and living in a bad neighborhood did not consistently predict gun carrying.

In the second set of logistic regression analyses (Table 3.4.2), we focused on victimization as the dependent variable and carrying a gun and other factors as the independent variables. Carrying a gun was significantly associated with victimization after the other variables were controlled for in two of the three years. Fewer other independent variables were associated with victimization as the dependent variable than were associated with carrying a gun as the dependent variable. The only significant associations with victimization across more than one year was violent delinquency and gang membership. In addition, drug dealing was significantly associated with victimization for a single year only.

We next repeated the analyses with the independent variables lagged one year prior to the independent variables in order to make the analyses truly predictive. Table 3.4.3 shows the

logistic regressions for predicting carrying a gun at the ages of 18 and 19, respectively. The results show that drug dealing, gang membership, and victimization predicted carrying a gun across the two years when the other variables were controlled for. In addition, living in a bad neighborhood predicted carrying a gun at age 19.

Finally, Table 3.4.4 presents the logistic regression predicting victimization at ages 18 and 19, respectively. The results show that only carrying a gun predicted victimization in the subsequent year when the other variables were controlled for.

Discussion

The following are the main findings:

- * The prevalence of carrying a gun increased between the ages of 17 and 19. In contrast, the prevalence of victimization remained relatively constant.
- * Carrying a gun and victimization were strongly related. This association was independent of concurrent forms of serious delinquency.
- * Victimization predicted carrying a gun better than the reverse. This may suggest that one of the reasons for the proliferation of guns is a heightened level of victimization.

Increasing the knowledge about the reasons why youngsters carry guns is important in our efforts to get guns out of the hands of young people. Targeting delinquency may only partially lead to a

reduction in the number of juveniles carrying guns. If youngsters who are victimized believe that guns will protect them from being harmed in the future, they will need to be convinced that gun carrying may increase rather than decreased their risk of becoming a victim of a gun related crime. At the same time, an environment, such as in school and in neighborhoods, needs to be created in which young juveniles feel safe without the protection of a gun.

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Table 3.4.1: Logistic regression of carrying a gun with other related variables (significant odds ratios)

	<u>Carrying a gun</u>		
	<u>Age 17</u>	<u>Age 18</u>	<u>Age 19</u>
<u>Current year</u>			
Violent delinquency	5.7**	6.6**	7.2***
Drug dealing	9.7***	6.5***	9.4***
Gang membership	ns	6.8**	6.0**
Living in bad neighborhood	ns	ns	2.4*
African-American ethnicity	ns	ns	ns
Victimization	4.1**	ns	2.8*
X ²	68.0	100.6	55.2

* p < .05; **p < .01; *** p < .001

All X², p < .0001

Table 3.4.2: Logistic regression of victimization with other related variables (significant odds ratios)

	<u>Victimization</u>		
	<u>Age 17</u>	<u>Age 18</u>	<u>Age 19</u>
<u>Current year</u>			
Violent delinquency	ns	3.1*	2.9*
Drug dealing	ns	ns	2.5*
Gang membership	2.9*	2.9*	ns
Living in bad neighborhood	ns	ns	ns
African-American ethnicity	ns	ns	ns
Carrying a gun	3.8**	ns	2.8*
X ²	36.8	41.9	61.3

* p < .05; **p < .01; *** p < .001

All X², p < .0001

Table 3.4.3: Logistic regression predicting carrying a gun with related variables in the previous year (significant odds ratios)

<u>Previous year</u>	<u>Carrying a gun</u>	
	<u>Age 18</u>	<u>Age 19</u>
Violent delinquency	ns	ns
Drug dealing	3.9	3.6**
Gang membership	9.2	3.2*
Living in bad neighborhood	ns	2.1*
African-American ethnicity	ns	ns
Victimization	3.2	2.8*
X ²	55.2	75.4

* p < .05; **p < .01

All X², p < .0001

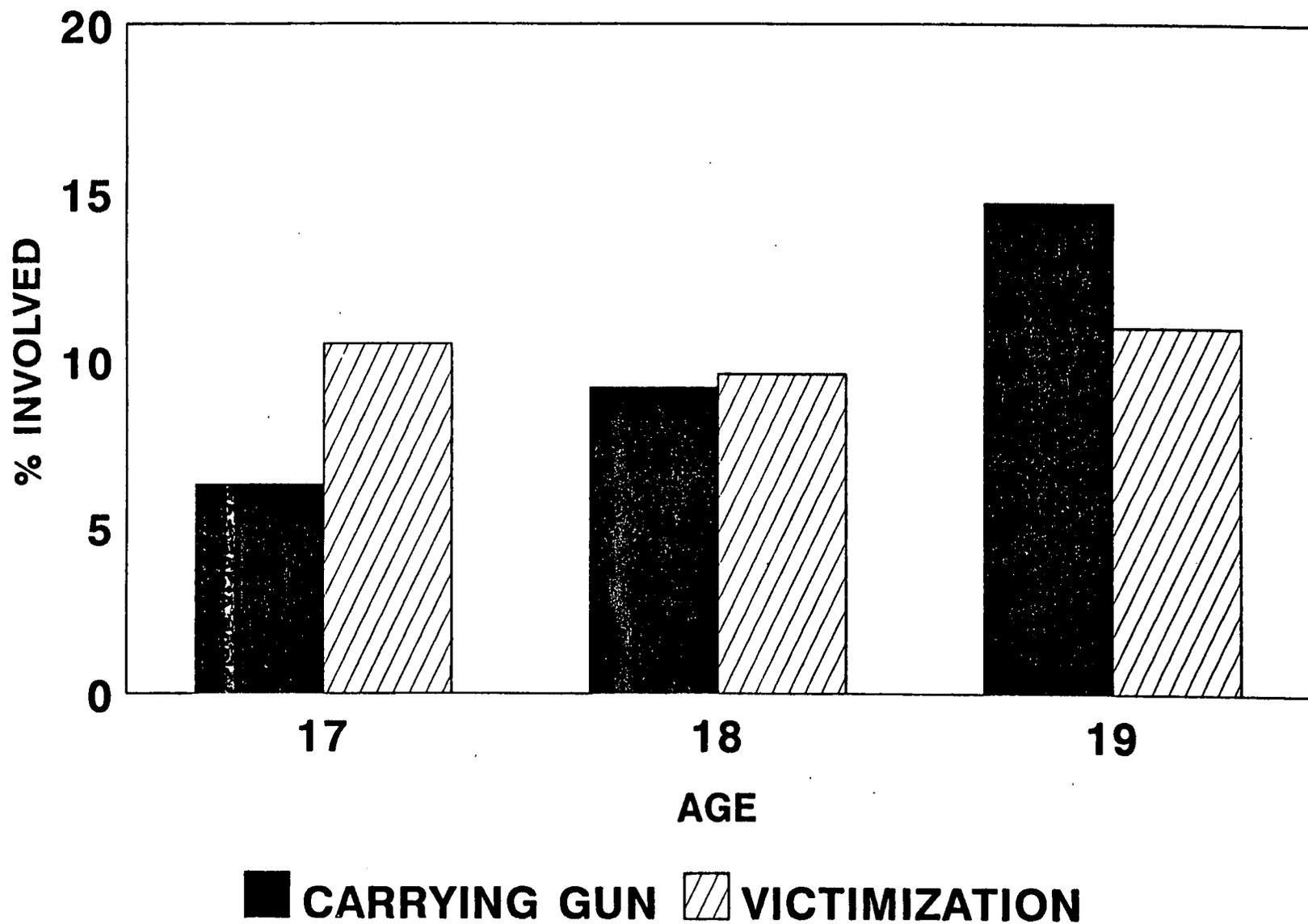
Table 3.4.4: Logistic regression predicting victimization with related variables in the previous year (significant odds ratios)

	<u>Victimization</u>	
	<u>Age 18</u>	<u>Age 19</u>
<u>Previous year:</u>		
Violent delinquency	ns	ns
Drug dealing	2.2a	ns
Gang membership	ns	ns
Living in bad neighborhood	ns	ns
African-American ethnicity	ns	ns
Carrying a gun	2.5a	3.2*
X^2	29.0	22.7

a = $p < .10$; * $p < .05$

All X^2 , $p < .0001$

FIGURE 3.4.1 PREVALENCE CARRYING A GUN AND VICTIMIZATION AGES 17 THROUGH 19



3.5 THE PRECURSORS OF YOUNG FATHERHOOD AND ITS EFFECT ON THE DELINQUENCY AND PROSOCIAL CAREERS OF TEENAGE MALES

When children grow up, certain behaviors are called problem behaviors because they are considered age-inappropriate, such as sexual intercourse in early adolescence or becoming a father at a young age. Research in the area of teenage pregnancy has focused primarily on the experiences of teenage mothers. Until recently, little attention has been paid to teenage fathers. According to recent national surveys, the prevalence of teen fatherhood ranges from three to seven percent (Sonenstein et al., 1993; Marsiglio 1987). Rates appear to be much higher among inner city minority youth (Sullivan, 1993; Sonenstein et al., 1993; Marsiglio 1987).

An emerging conceptual framework looks at the association of teenage fathering with other problem behaviors. Three recent studies have found that adolescent males involved in a pregnancy had more of these problem behaviors (Resnick et al., 1993; Christmon & Luckey, 1994; Dearden et al., 1995). Ketterlinus et al. (1992) found that teenage fathers, as well as those who reported causing a pregnancy and those who were sexually active were all more involved in problem behaviors compared to the group of virgins. Thus far, research has not adequately described the levels of problem behaviors in the years before or after the time of becoming a teenage father.

In addition, research is not clear as to which factors are associated with serious delinquency, which factors are associated

with early fatherhood, and which are related to both outcomes. According to problem theory (Jessor & Jessor, 1977), we would expect that risk factors for serious delinquency also apply to early fatherhood. On the other hand, some young fathers may not be delinquent; therefore, risk factors for serious delinquency can be expected to only partly overlap with those for early fatherhood.

The purpose of this research was to explore the relationship of early fatherhood to delinquency and to the correlates and explanatory variables of delinquency. We were interested in the following questions:

- 1) Is early fatherhood related to serious delinquency?
- 2) Are factors associated with serious delinquency the same as those associated with early fatherhood?

These two questions concern problem theory. The following two questions look more closely at the relationship in time of delinquency and becoming a father:

- 3) Prior to becoming a father, are adolescent fathers more delinquent than non-fathers?
- 4) Are adolescents who become fathers subsequently engaged in less delinquency than non-fathers?

Method

Participants. Participants of the oldest sample (n=503) of the Pittsburgh Youth Study were the focus of this study. They were about 12-13 in the beginning of the study and are now in

their early twenties. Fatherhood and delinquency were used as dependent variables. Early Fatherhood was defined as having become a father before age 19. This was the case for 12.3% of the sample. There were two measures of serious delinquency. The first measure, serious delinquency at A, identifies those participants (36.6%) who, by assessment A, had committed any of the following offenses according to their self-report, the report of their parent or the report of their teacher: car theft, breaking and entering, strong-arming, attack to seriously hurt or kill, or rape. The second measure, varied serious delinquency, covers the four-year assessment period from assessments B to I. To be classified in the varied serious delinquent group a participant had to have committed a delinquent act in two of the delinquent categories mentioned above within a one-year period. 21.9% of the sample was classified as varied serious delinquents.

The independent variables were measured up to assessment A (second assessment) and were divided into correlates and explanatory variables. Correlates were defined as those factors that measure an aspect of antisocial conduct, such as untrustworthiness or positive attitude to delinquency. Explanatory variables do not measure an aspect of antisocial behavior but may affect it, such as SES or poor supervision. The explanatory variables were subdivided into three broad groups: Child variables, Family variables, and Macro variables, such as demographic, socioeconomic, and neighborhood characteristics. All variables used in the analyses were dichotomized to identify

the worst quarter. The main statistics used were odds ratio and hierarchical multiple regression.

Results

Figure 3.5.1 shows the cumulative onset of sexual intercourse and fatherhood between the ages 13 and 18 (weighted). At the second assessment, when the participants were in the beginning of grade 8 and were, on average, 13 years old, 44% of them had engaged in heterosexual intercourse, which increased to 88% at age 13. Two of them had become fathers by that time. As we followed the participants when they were growing older we found that about 40% of the sexually active participants did not protect themselves from impregnating their partners nor had partners who protected themselves. Not surprisingly then, before age 19, 12.3% of the sample had become fathers (N=62).

These 62 young men had a total of 82 children. By approximately age 19 only 12% of the children lived with their fathers. About 35% of the children saw their fathers daily, and about half of the children saw them less than once a week or never. Most of the fathers were not in a financial position to substantively help support the child.

The first question we posed was: Is early fatherhood related to serious delinquency? Young fathers, compared to non-fathers, were twice as likely to be classified as serious delinquent than the remainder of the sample, either at the beginning of the study (assessment A, OR = 2.2, p. < .01), or

subsequently (assessments B through I, OR = 2.6, $p < .001$). The odds ratios are substantial but not extremely large, leaving sufficient space for possibly different explanatory variables.

This leads us to the second question: Are factors associated with serious delinquency the same as those associated with early fatherhood? The independent variables were measured at assessment A and were divided in correlates and explanatory variables. The outcome variables were varied serious delinquency in the four years since assessment A and being a father before age 19. Table 3.5.1 shows the relationship of the child correlates with varied serious delinquency and with early fatherhood. The Ps, Bs, and Ts in Table 3.5.1 denote parent, boy, and teacher, respectively. Fewer correlates were associated with early fatherhood than with varied serious delinquency (8 vs. 17), but all correlates of early fatherhood were also correlates of varied serious delinquency. On the other hand, several factors were correlates of varied serious delinquency but not of early fatherhood: drug use up to assessment A, oppositional and conduct disorder problems, physical and nonphysical aggression, manipulates, unaccountable, and running away. The strongest correlates of early fatherhood were boys being exposed to drug dealing (OR = 3.9), while the strongest correlate of varied serious delinquency was positive attitude to problem behavior (OR = 3.6) followed by boys having engaged in sex at an early age (OR = 3.0).

Table 3.5.2 lists family, school, and peer correlates of

varied serious delinquency and early fatherhood. Almost all of the correlates of varied serious delinquency were also correlates of early fatherhood (exceptions were boys' countercontrol when parents disciplined them and boys having bad friends (both not related to early fatherhood)). The strongest correlate of varied serious delinquency was truancy (OR = 4.5), while the strongest correlate of fatherhood was boys being suspended from school (OR = 3.0). A number of variables with non-significant odds ratios are not listed in Table 3.5.2. Those are: less persistent discipline, parent does not enjoy child, bad relationship with parents, does not get along with siblings, and few conventional friends.

In summary the correlates associated with fatherhood listed in Tables 3.5.1 and 3.5.2 are a subset of those associated with delinquency. All the variables that have an odds ratio for varied serious delinquency of over 2.5, with one exception, have a significant odds ratio for fatherhood, but generally of a smaller magnitude.

Turning to the group of explanatory variables, Table 3.5.3 shows that more of the explanatory variables were related to varied serious delinquency than to early fatherhood (19 vs. 12); however, in almost all instances in which an explanatory factor applied to varied serious delinquency, it also applied to early fatherhood (the exception is low organizational participation, which is related only to early fatherhood). In contrast, several variables were related to varied serious delinquency but not to

early fatherhood, including the two hyperactivity variables, depressed mood, and parental low reinforcement, poor communication between the boys and their parent, and boy not involved in family matters. In addition, low SES and poor housing were related to varied serious delinquency but not to early fatherhood. The variables that are most strongly related to early fatherhood are being African American (OR = 4.6), being old for grade (OR = 3.6), low achievement (OR = 3.1), coming from a broken home (OR = 3.1), and coming from a bad neighborhood (OR = 2.8).

Not mentioned in Table 3.5.3 are those variables that did not show a significant relationship with either varied serious delinquency or with early fatherhood. These were: anxiety, shy/withdrawn, low jobs/chores, low religiosity, few friends, disagree on discipline, not close to mom, parent perception of problems, unhappy parents, parent substance use, dad behavior problems, mom unemployed, and large family.

Which variables would best explain varied serious delinquency or early fatherhood when controlling for other variables? For that purpose, we performed two hierarchical multiple regressions to see which explanatory variables would enter the model predicting varied serious delinquency and early fatherhood. The variables were put in blocks. first the child variables were entered, then the family variables, and finally the macro variables. This was done using a model specifying the proximity of influences on a child's behavior. The Xes refer to

the significant F change when the variable was entered.

Serious varied delinquency and early fatherhood share the following explanatory variables (Table 3.5.4): low achievement and the two neighborhood variables. Unique explanatory variables for varied serious delinquency were lack of guilt, the two hyperactivity variables, family variables of poor reinforcement and poor supervision, and poor education of the mother. Unique for early fatherhood is old for grade, broken home, and being African American.

In summary varied serious delinquency and early fatherhood are related and share correlates and explanatory variables but not to such an extent that a single problem theory is able to explain serious delinquency and early fatherhood.

The next question we addressed was the degree of delinquency of the young fathers. For that we needed to compare fathers with non-fathers. Knowing that fathers were more likely to be older than their classmates, to come from bad neighborhoods, and were more likely to be African American, we matched each father with a non-father on those three characteristics. Thus, two groups were formed, each with 62 participants. This allowed us to examine the relationship of fatherhood with delinquency more closely, using a matched control group. Table 3.5.5 compares the delinquency of the two groups. It shows that at assessment A, future early fathers were not more likely than their matched controls to be in the serious delinquent group. However, they were 2.5 times more likely in the next four years to have

qualified as varied serious delinquents.

How does fatherhood affect subsequent delinquency? Several options appear plausible. Fatherhood may push boys to become more conventional and less delinquent since they will have the task of taking care of the mother and the child. A second possibility is that young fathers become more involved in delinquent activities in order to raise money for the mother and the child. A third possibility, indicative of the independence between delinquency and fatherhood, is that fatherhood does not affect the level of subsequent delinquency.

The results show that, when we compared fathers and their controls, the likelihood of being in the varied serious delinquency group was not different in the year before fatherhood, but fathers were 7.5 times more likely to be in the varied serious delinquency group in the year that they reported fatherhood, and 4.2 times more likely in the year after.

Are particular delinquent acts associated with fatherhood? When we examined which of the delinquent acts contributed most to early fathers being in the varied serious delinquency group, it was covert behaviors, rather than violence. In the phase that they became fathers, early fathers were three times more likely to have been involved in car theft or breaking and entering (OR = 3.0, $p < .05$ vs. OR 1.49 n.s. for violence).

As could be expected from the above, we did not find that early fathers were more likely to reduce their delinquent involvement after fatherhood than their controls in the same

assessment phases. In fact, on a number of other measures of problem behavior they were worse off than their matched controls, which is shown in Table 3.5.6.

Up to assessment I, early fathers were more likely to have a court petition (OR = 3.8), to be drinking frequently (OR = 2.6), to have dropped out of school (OR = 2.5), and to have been involved in drug dealing (OR = 2.3). However, the following variables did not show a significant difference between the two groups: frequent smoking, frequent drug use, carrying weapons, and being in a gang fight.

Discussion

In summary, within the whole sample, early fatherhood is related to delinquency but only to a modest degree. The correlates and explanatory variables associated with early fatherhood are a subset of those associated with delinquency, suggesting that a single problem theory is too simple a model to explain the data. Unique for delinquency were lack of guilt, attention deficit/hyperactivity, poor parental reinforcement and supervision, and poor education of the mother. Unique for early fatherhood was old for grade, broken home, and being African American. Early fatherhood was not related to a reduction in delinquency after the child was born.

Compared to males of the same neighborhood, ethnicity, and age, early fathers were troubled young men who were more likely to have engaged in serious delinquency in the year of fatherhood

and the year after fatherhood than their matched controls. Also, they had less education and more court contacts and were more likely to have been classified as frequent drinkers and drug dealers than their matched controls. This bodes ill for their future and, as a consequence, for their role as a father.

In addition, although we have not looked at this, what is known about assortative mating would suggest that the mothers of the offspring may have some of the same characteristics as the fathers, that is, they will be young, possibly antisocial, and have low academic achievement. Therefore, it is quite likely that the children of these young fathers will have many strikes against them right from the start.

For many of the young it seems as if there is no cost attached to becoming a father. They will not be called upon to contribute to the upbringing of the child, either financially or in time. In addition, no stigma is attached to making a girl pregnant; on the contrary it may be a sign of manhood. It is, therefore, very difficult to imagine measures that would reduce the rate of early fatherhood or increase the feeling of responsibility for offspring without providing the possibility for an economic basis for family units.

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Table 3.5.1: Odds Ratios of Child Correlates Measured at Phase A as Predictors of Varied Serious Delinquency and of Early Fatherhood.

<u>Child Behaviors</u>	<u>Varied Serious Delinquency</u>	<u>Early Fatherhood</u>
Early sex (B)	3.0***	2.6***
Non-physical aggression (PT)	2.1***	
Physical aggression (PT)	2.4***	
Oppositional problems (P)	2.3***	
Conduct disorder problems (P)	2.4***	
Untrustworthy (PT)	2.7***	1.8*
Manipulates (PT)	2.5***	
Unaccountable (PT)	2.1**	
Cruel to people (PT)	2.9***	2.2**
Run away (PB)	2.1***	
Delinquency up to A (PBT)	4.4***	2.0**
Drug use up to A (B)	2.4***	
Drug exposure (B)	2.6***	3.9***
<u>Child Attitudes</u>		
Positive to problem behavior (B)		3.6***
Positive to substance use (B)	2.0**	1.9*
Positive to delinquency (B)	2.8***	2.0*
Less likely to get caught (B)	2.0**	1.9*

Note: B=boy; P=parent; T=teacher.

* $p < .05$; ** $p < .01$; *** $p < .001$, based on chi squares.

Table 3.5.2: Odds Ratios of Family, School, and Peer Correlates Measured at Assessment A as Predictors of Varied Serious Delinquency and Early Fatherhood.

	<u>Varied Serious</u> <u>Delinquency</u>	<u>Early</u> <u>Fatherhood</u>
<u>Family</u>		
Countercontrol (PB)	2.0**	
<u>School</u>		
Truant (PBT)	4.5***	2.0*
Low school motivation (T)	3.8***	2.5***
Suspended (PB)	3.4***	3.0***
Negative att. to school (B)	2.6***	1.8*
<u>Peers</u>		
Not get along with peers (T)	3.8***	2.0*
Bad friends (PB)	2.1***	
Delinquent peers (B)	3.8***	2.3**
Peer substance use (B)	2.3***	1.9*

Note: B=boy; P=parent; T=teacher.

* $p < .05$; ** $p < .01$; *** $p < .001$, based on chi squares.

Table 3.5.3: Odds Ratios for Explanatory Variables as Measured at Assessment A for Varied Serious Delinquency and Early Fatherhood.

	<u>Varied Serious</u> <u>Delinquency</u>	<u>Early</u> <u>Fatherhood</u>
<u>Child</u>		
Lack of guilt (PT)	3.0***	2.0*
Old for grade (P)	1.7*	3.6***
Low achievement (PBT)	3.1***	2.1**
Low achievement (CAT)	1.9**	3.1***
Low organizational participation (PB)		1.9*
HIA problems (PT)	2.5***	
High ADHD score (P)	2.4***	
Depressed mood (B)	1.6*	
<u>Parent</u>		
Low reinforcement (PB)	1.9**	
Poor supervision (PB)	2.1**	1.8*
Poor communication (PB)	1.7*	
Boy not involved (PB)	1.7*	
<u>Macro</u>		
Poor education mom (P)	2.3***	2.0*
Low SES (P)	1.7*	
Family on welfare (P)	1.9**	2.6***
Poor housing (P)	1.8*	

(Table 3.5.3, continued)

African American (P)	2.0**	4.6***
Broken home (P)	2.6***	3.1***
Bad neighborhood (C)	2.6***	2.8***
Bad neighborhood (P)	2.3***	2.8***

Note: B=boy; C=census; CAT= California Achievement Test;

P=parent; T=teacher. * $p < .05$; ** $p < .01$; *** $p < .001$, based on chi square.

Table 3.5.4: Hierarchical Multiple Regression for Varied Serious Delinquency and Early Fatherhood with Explanatory Variables Measured at Assessment A.

	<u>Varied Serious</u> <u>Delinquency</u>	<u>Early</u> <u>Fatherhood</u>
<u>Child</u>		
Old for grade		X
Low achievement	X	X
Lack of guilt	X	
High ADHD score	X	
HIA problems	X	
<u>Family</u>		
Poor reinforcement	X	
Poor supervision	X	
<u>Macro</u>		
Bad neighborhood (C)	X	X
Poor education mom	X	
Bad neighborhood (P)	X	X
Broken home		X
African American		X
Multiple R	.373	.306

C=Census; P=Parent; X=significant F change.

Table 3.5.5: Early Fathers Compared to Matched Controls on Measures of Delinquency.

	<u>Odds Ratio</u>
Serious Delinquency up to Phase A	1.7 ns
Varied Serious Delinquency Phases B to I	2.5*
Delinquency in year before fatherhood	1.7 ns
Delinquency in year of fatherhood	7.5**
Delinquency in year after fatherhood	4.2*

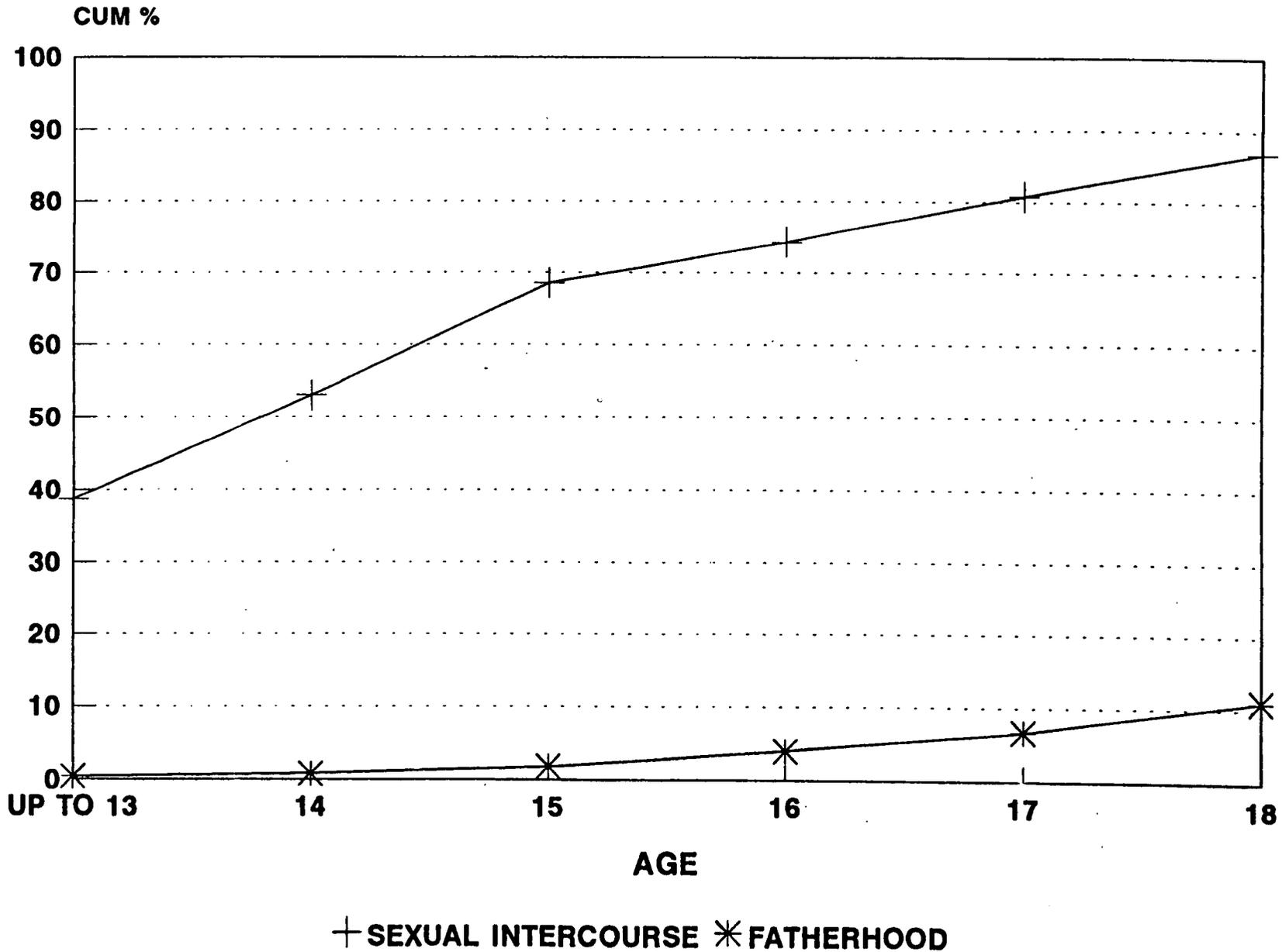
* $p < .05$; ** $p < .01$, based on chi square.

Table 3.5.6: Fathers Compared to Matched Controls on Problem Behaviors

	<u>Odds Ratio</u>
Court petition	3.8***
Frequent drinking	2.6**
School dropout	2.5**
Ever dealt in drugs	2.3*

* $p < .05$; ** $p < .01$; *** $p < .001$, based on chi square.

FIGURE 3.5.1: PERCENT OF SUBJECTS WHO HAVE HAD SEXUAL INTERCOURSE OR WHO ARE FATHERS



(WEIGHTED DATA)

4. SITE-SPECIFIC ANALYSES: ROCHESTER YOUTH DEVELOPMENT STUDY

4.1 DRUG SELLING, GANG MEMBERSHIP, AND FIREARMS CARRYING AMONG YOUTH

Alan J. Lizotte

Since the mid 1970's homicide rates have declined for America's adults. However, over the same time period homicide rates for those under 25 years of age have increased rather dramatically. This increase has been particularly profound for the nation's minority youth (see Blumstein, 1995) which is overwhelmingly due to increases in firearms-related homicide. Blumstein (1995) has argued that the increase in firearms homicide closely parallels increases in drug arrests and gang activity among minority youth over time. It is thought that the triple threat of gangs, drug sales, and guns leads to disastrous consequences. While plausible, this argument cannot be demonstrated using time series data. For example, it is equally plausible that the youth homicide rate increased over the period because semiautomatic handguns came into use and allowed for more shots to be fired in the same number of incidents, thus increasing the "kill rate" per incident. Only individual-level data can show whether gun carrying and use results from gang membership and drug selling.

Also, while there is some research on patterns of legal and

illegal firearms ownership among juveniles, relatively little has been done to explain illegal gun carrying among youth. Doing so is important since carrying on the street should be a greater threat to society than simply owning a gun for illegitimate reasons. The Centers for Disease Control (1991) report that more than four percent of high school students in grades 9 through 12 have carried a firearm at least once in the last 30 days, and that 35.5 percent of these had carried 6 or more times in that period. Another survey found that 60 percent of students in Baltimore knew someone who carried a gun to school (Hackett, 1988).

This analysis uses data from Wave 8 of the Rochester Youth Development Study (RYDS) to address the issue of gun carrying among male youths (n=587) and to examine the link between guns, gangs, and drug sales. At Wave 8 the subjects were on average 17 years of age. In this analysis we will consider (1) the amount and type of gun carrying; (2) the relationship between various types of gun ownership and gun carrying and the likelihood of committing gun crime; and, (3) the relationship between selling drugs, gang membership, and illegal gun ownership and carrying.

Carrying Guns

Surveys that ask youths about gun carrying typically assume that all gun carrying is bad. Asking if the respondent has carried a gun in the past 30 days ignores the fact that people frequently carry guns to hunt, target shoot, or carry guns to and

from their cars when transporting the gun legally. This invariably inflates the estimate of the amount of gun carrying and makes the problem seem worse than it is. It also obscures the social location of the real problem. Similarly, asking youths if they know someone who carried a gun to school artificially magnifies the problem by the number of respondents who know of the same, probably high profile, incident.

In the Rochester Youth Development Study we asked respondents if they own a gun for sport or for protection. (See Lizotte et al., 1994 for the validity of this technique for measuring legal and illegal gun use.) We then asked if they carried that gun on the street, yielding separate estimates of carrying guns for sport and for protection. About six percent of the 17 year old males have carried guns in the past six months -- four percent (n=24) have carried guns for protection and about two percent (n=10) have carried for sporting purposes. In other words, simply asking about carrying for any reason would have resulted in an estimate of illegal gun carrying 50 percent higher than it should be.

Carrying Guns and Gun Crime

Figure 4.1.1 shows that the reason for carrying a gun matters a great deal in terms of undesirable outcomes. Those who own guns for sport and who report carrying sporting guns simply do not commit gun crime. However, more than 20 percent of those who own guns for protection and more than 36 percent of those who

carry protection guns have committed a gun crime. About 1.4 percent of those who neither own nor carry either type of gun commit gun crime. Therefore, it is the carrying of protection guns, not just any type of gun, that leads to the most undesirable outcomes.

Gangs, Drug Sales, and Guns

Figure 4.1.2 shows the percentage of drug sellers, gang members, and others who own guns for protection. Drug sellers are the most likely to own protection guns. Almost thirty percent of drug sellers own guns for protection and nearly 23 percent of gang members do, but only about 5 percent of others do so. Figure 4.1.3 shows that drug sellers are also most likely to carry protection guns. Over twenty-two percent of drug sellers and 15 percent of gang members carry protection guns, as compared to about 2 percent of the others. This suggests that the effect of drug selling on protection gun ownership and carrying is somewhat stronger than the effect of gang membership.

It is important to point out that not all drug sellers are gang members and not all gang members are drug sellers. In fact, the overlap between the two groups is quite modest; at Wave 8 only 17.9 percent of drug sellers are gang members and 26.6 percent of gang members sell drugs. The overlap is substantial enough to have an interesting impact though. When multivariate statistical models that include the effects of drug selling, gang membership, peer gun ownership for protection, and demographic

factors are estimated, gang membership ceases to be a significant predictor of protection gun carrying. In this model the only two important and significant predictors of protection gun carrying are selling drugs and having peers who own protection guns. The latter effect is not surprising since the peers of drug dealers may be drug dealers themselves and find the same need to carry protection guns. Furthermore, the interaction term accounting for the intersection of drug selling and gang membership is insignificant when included in the multivariate model.

Summary

About 4 percent of these 17 year olds carried a gun for protection during the past six months. An additional 2 percent carried guns for sporting reasons. The latter group is of no particular threat to society while the former is of great concern. Those who own and carry protection guns are likely to be involved in gun crime, and some gun crimes are likely to result in injury or death. Drug sellers are most likely to own protection guns, and they are most likely to carry guns on the street. Gang members also have elevated rates, but are somewhat less likely than drug sellers to own and carry protection guns. There is some overlap between selling drugs and gang membership, and multivariate analysis shows that it is drug selling, rather than gang membership, that drives gun carrying for protection. Other things being equal, being a gang member does not raise one's risk of gun carrying over the risk already imposed by

selling drugs alone. Finally, having friends who own protection guns significantly raises the risk of protection gun carrying for the subject. Drug selling is a dangerous activity that places one in contact with others who are armed. As a result it appears that dealers arm themselves.

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Figure 4.1.1 Percent Committing Gun Crime

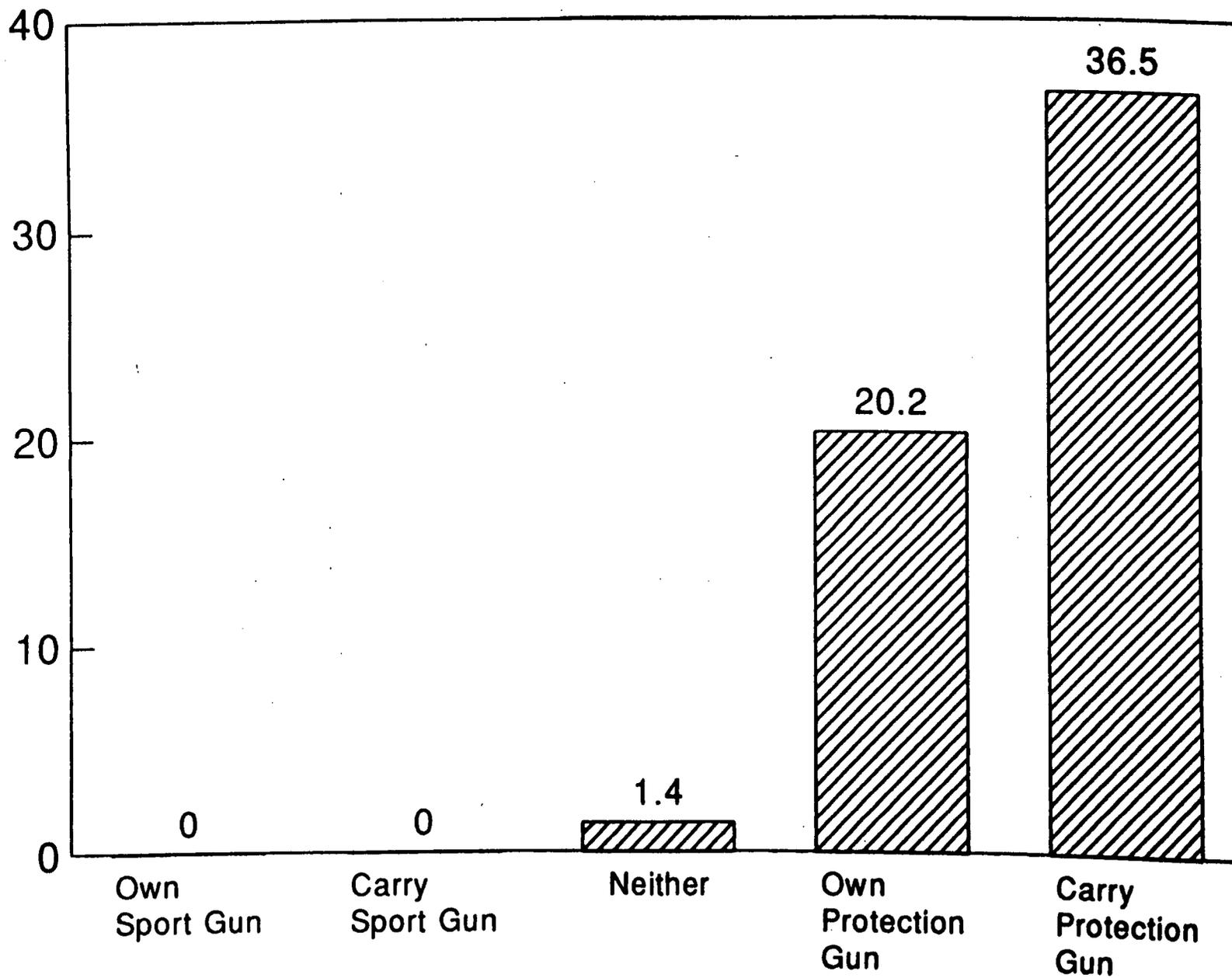


Figure 4.1.2 Percent Owning Gun for Protection

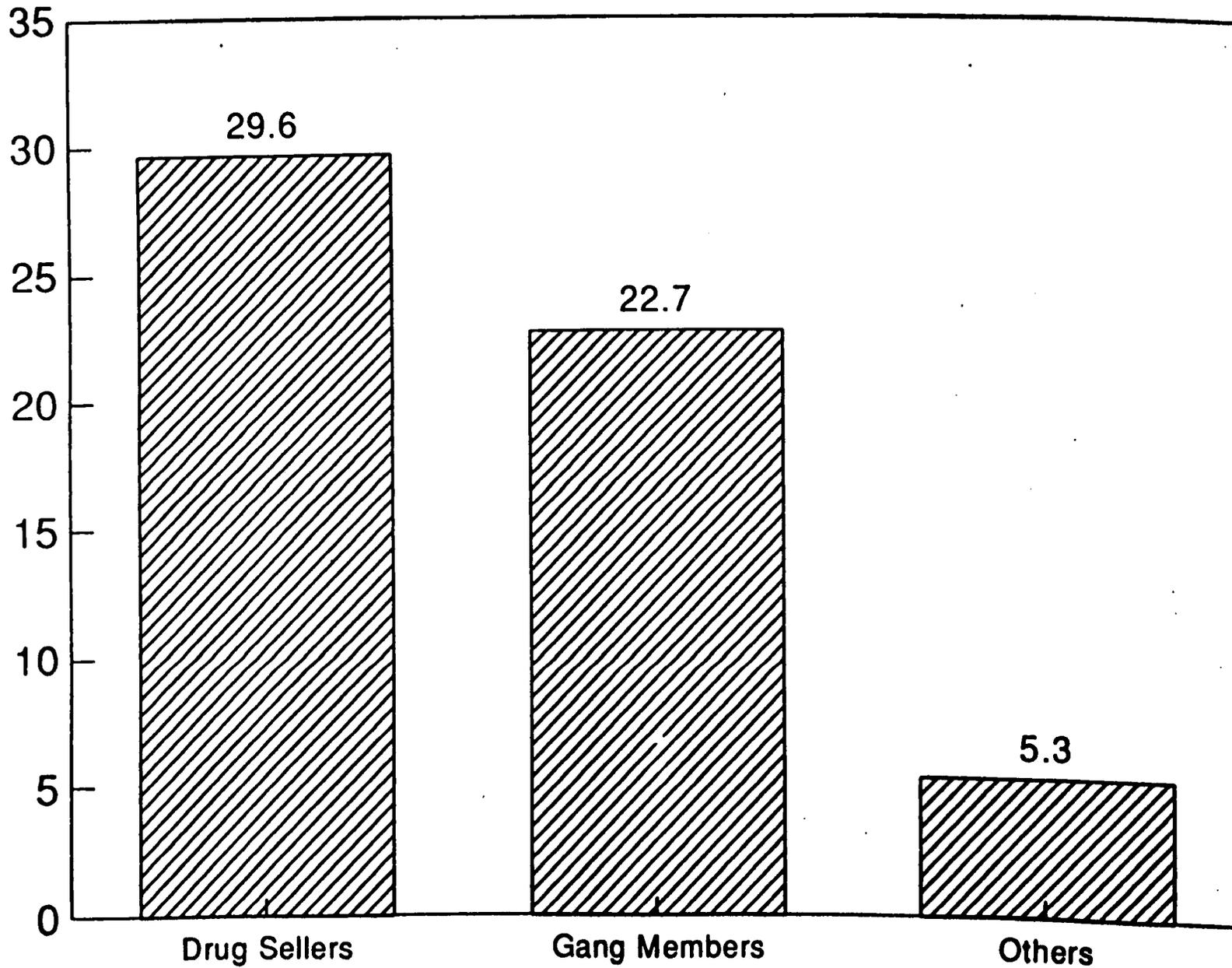
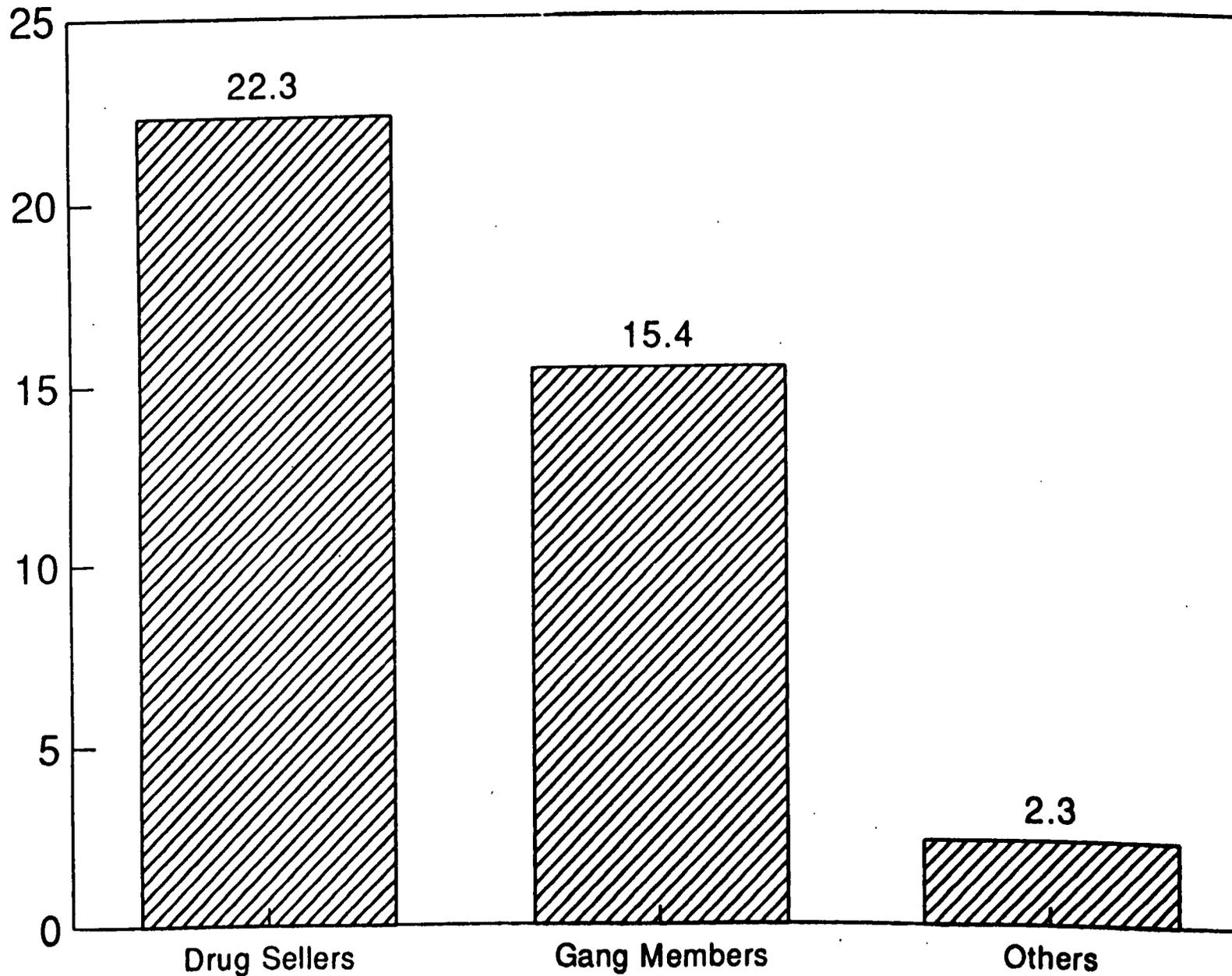


Figure 4.1.3 Percent Carrying Gun for Protection



4.2: THE CONTRIBUTION OF GANG MEMBERS TO THE VOLUME OF DELINQUENCY

Terence P. Thornberry

Prior studies of the relationship between gang membership and involvement in delinquency have all concluded that gang members are far more involved in delinquency, especially serious delinquency, than are non-members. This relationship has been observed in studies based on official, survey, and observational data, from the earliest studies of gangs (e.g., Thrasher, 1927), through the "classic" period of gang studies (e.g., Klein, 1971; Miller, 1966; Short and Strodbeck, 1965; Spergel, 1964) to more recent studies (e.g., Fagan, 1989, 1990; Hagedorn, 1988; and Vigil, 1988).

The relationship between gang membership and elevated rates of violence and delinquency has also been observed in the studies of the Program of Research on the Causes and Correlates of Delinquency. In Rochester, for example, Thornberry et al. (1993) have shown a strong relationship between gang membership and delinquency for males and Bjerregaard and Smith (1993) have demonstrated the same relationship for females. Esbensen and Huizinga (1993), using data from the Denver Youth Survey, also report that gang members are more heavily involved in delinquency than are non-members.

Despite the wealth of information on gang membership and

delinquency, we have surprisingly few estimates of the proportion of all delinquent acts for which gang members are responsible. That is, while prior research has shown that gang members have a higher rate of offending than non-members, we do not know how much of the total volume of crime is attributable to gang members.

Methods

To provide an initial assessment of this issue we examine the contribution of gang members and non-members to various forms of delinquency cumulated over a four year period -- Waves 2 through 9 -- of the Rochester Youth Development Study. This time period covers the high school years.

Gang membership is divided into two categories. "Ever Gang Member" refers to youths who reported being gang members at some point prior to the Wave 9 interview (mean age = 17.5). Based on prior work (Thornberry et al., 1993), we know that most of these youths were gang members for one year or less and that very few were members for several years. "Never Gang Member" refers to youths who reported no involvement in gangs prior to Wave 9.

Delinquency is measured by a variety of indices; the items in each index can be found in Appendix A. The measures included in this analysis were each created in the same fashion; we use general delinquency to illustrate the procedure. General delinquency is a 25-item omnibus scale. At each six-month interview the respondents were asked if they had committed any of

these offenses and if so how many times. For each subject we summed the total number of delinquent acts they reported over the four year period. Then, by cumulating across subjects we estimated the total number of delinquent acts that all respondents reported. The analytic question is: for what percentage of these acts are gang members responsible given their share in the population? This analysis tells us the proportion of the self-reported delinquent acts for which gang members are responsible, although these acts were not necessarily committed during periods of active gang membership.

Results

The prevalence of gang membership in the Rochester Youth Development Study is 31.5 percent (Table 4.2.1). That is, approximately one-third of the subjects reported being a member of a street gang at some point prior to the Wave 9 interview. In contrast, two-thirds of the subjects (33.1) reported never having joined a street gang.

The remaining data in Table 4.2.1 provide a direct answer to the question posed for this analysis. If gang membership were unrelated to involvement in delinquency, then gang members should be responsible for about one-third of the delinquent acts that are reported. That is, their share of crime and delinquency should be proportionate to their share in the population.

Even a casual glance at the data in Table 4.2.1 indicates that this is not so. We can start by looking at the general

delinquency index. Over the four years covered in this analysis, a total of 67,632 self-reported delinquent acts were reported by our panel members. Of these, 45,269 -- or 67 percent -- were reported by gang members. Thus, gang members account for proportionately twice as many delinquent acts as one would expect given their share in the population. In contrast, the non-gang members represent 68.5 percent of the panel but only account for 33 percent of these delinquent acts.

In Panel B of Table 4.2.1 the indices are grouped according to the seriousness of the delinquent acts. The disproportionate contribution of gang members to delinquency increases as the seriousness of the crimes increases. While only one-third of the people in the study, the gang members account for 90.2 percent of all the serious delinquent acts reported in the interviews. They also account for 72.3 percent of the acts on the moderate delinquency index and 69.8 percent of the acts on the minor delinquency index.

Panel C presents data by type of offense -- violent, property, public disorder, and drug sales. The gang members are responsible for 80.5 percent of all the self-reported violent acts, 70.6 percent of the property crimes, 71.9 percent of the public disorder crimes, and 73.1 percent of the drug sales.

Finally, Panel D presents information on substance use. Gang members report 66.4 percent of the instances of alcohol use that were uncovered during the four year period of this analysis. They also accounted for 67.3 percent of the instances of other

drug use.

Summary

Overall, the data presented here clearly indicate that gang members are disproportionately involved in delinquent behavior and, in fact, account for the lion's share of delinquent acts, especially the more serious delinquent acts. While only representing one-third of the sample in the Rochester Youth Development Study, gang members account for 90 percent of the serious delinquent acts, 80 percent of the violent delinquent acts, and 73 percent of the drug sales.

The data presented in this brief analysis reinforce the importance of establishing effective prevention programs for gang members. While previous research has informed us that gang members have higher rates of offending than non-gang members, the present analysis indicates the magnitude of that differential. Gang members are responsible for approximately twice as many delinquent acts as their share in the population would suggest, and they are responsible for the vast majority of the serious and violent delinquencies reported to us.

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Table 4.2.1. Gang Members' Proportionate Share of Delinquent Acts

	Ever <u>Gang Member</u>	Never <u>Gang</u> <u>Member</u>
Prevalence of Gang Membership	31.5%	68.5%
<u>Percentage of Delinquent Acts</u>		
A. General Delinquency	66.9	33.1
B. Seriousness Level		
Serious	90.2	9.8
Moderate	72.3	27.7
Minor	69.8	30.2
C. Type of Offense		
Violent	80.5	19.5
Property	70.6	29.4
Public Disorder	71.9	28.1
Drug Sales	73.1	26.9
D. Substance Use		
Alcohol Use	66.4	33.6
Drug Use	67.3	32.7

4.3: TEEN FATHERHOOD

Carolyn Smith

The study of teen parenthood has become almost synonymous with the study of teen mothers. While relatively little attention has been devoted to the study of teen fathers, it is nevertheless an important area of inquiry. It appears that becoming a teen father has negative developmental consequences for both the teen father and his children. Among those consequences is involvement in delinquent behavior; teen fatherhood appears to be associated with their continued delinquency and the children of a teen father are at higher risk for involvement in antisocial behavior and delinquency.

An understanding of the social processes associated with fatherhood can be illuminated using a risk factor approach. A risk factor approach assumes that many factors contribute to a given outcome, and that it is the cumulation of risk across different areas of the youth's life context that is most strongly related to increased vulnerability to negative outcomes later in the life course.

The Rochester Youth Development Study is well positioned to investigate teen fatherhood given the high rates of fatherhood in this urban sample, and the information that is available on a wide range of antecedents, including socioeconomic status, family structure and processes, schooling, attitudes, and behaviors. We

pose three research questions:

1. What is the prevalence of teen fatherhood in this sample of high-risk urban youth?
2. What risk factors and life domains are most closely associated with teen fatherhood?
3. Is cumulative risk or cumulative disadvantage related to particularly high levels of teen fatherhood?

Measurement

Teen fatherhood: We asked respondents to identify all their biological children, whether or not they lived with them. Teen fathers are those who were under 19 at the time they reported having their first child. All but 2.6% of the fathers reported being unmarried at this time. The respondents' parents agree with their self-report of paternity 95% of the time, suggesting high validity of this self-reported information.

Risk factors: Based on a general ecological framework, predictors of teen fatherhood are grouped into ten domains: neighborhood characteristics, family structural position, parental stress, parent-child relationships, school, early sexual activity, peer delinquency, individual characteristics, and delinquent behavior. Variables in these domains are measured during the first two years of the study prior to the age of onset of fatherhood in this sample. Measures are based on a combination of methods, including parent and respondent self-reports, and official data from schools and Census.

Results

Prevalence: The prevalence of teen fatherhood in the Rochester Youth Development Study is 19% at age 19, and is expected to be about 25% by age 20 when data gathering on the youngest subjects is concluded. Table 4.3.1 shows that the rate of teen fatherhood begins at age 14 and increases steadily from that point on.

Risk factors: A wide range of variables are associated with teen fatherhood including race, structural disadvantage, poor school performance, involvement in deviant behaviors, and involvement with deviant peers. Within this large field of factors, multivariate analysis identified seven risk factors that are consistently related to teen fatherhood. Three are measures related to our respondents' families -- parents' age at first birth, parent education, and family social support -- and four are respondent measures -- early sexual intercourse, gang membership, chronic drug use, and being African American or Hispanic.

Involvement in other deviant or problem behaviors, such as early sexual activity, gang membership, and chronic drug use, is strongly related to teen fatherhood. In fact, we found that teenagers who both belong to gangs and use drugs heavily have a very high probability of becoming teen parents.

Accumulation of risk: Over and above the effect of these particular factors or life domains, we investigated whether precocious fatherhood is associated with an accumulation of risk

factors over different life domains. We selected the seven risk factors that were consistently related to teen fatherhood, counted the number that each respondent exhibited, and related that to fatherhood. The results are dramatic as Figure 4.3.1 illustrates. Almost half of the young males with six or seven risk factors are teen fathers, in comparison to only one percent of those who have zero or one risk factor.

Discussion

Being a teen father is likely to have negative consequences for the father's own life course, as well as that of his child. This underlines the importance of developing policy and interventions that accurately target the antecedent factors in the lives of young men who are particularly at risk for fatherhood.

Young Hispanic and African American men are particularly at risk for fatherhood, and there are many issues in the environments and opportunity structures of young minority males that may contribute to this finding. Findings do suggest that targeting educational success may have a long-term payoff, since the effects of lack of education spill over into the next generation. Another important focus needs to be the negative peer environment typical of young males involved in other deviant behaviors. Early focus on this group of males seems particularly important. Enhancing alternative avenues of development may be accomplished via partnerships with existing community groups and

religious organizations, as well as via mechanisms such as community multiservice youth centers. Encouraging parent participation in this process may help youth develop social capital for life success, as well as provide a support base for parents struggling to raise teenagers.

Table 4.3.1. Prevalence of Teenage Fatherhood in the Rochester Youth Development Study

<u>Age</u>	<u>n</u>	<u>% Becoming Fathers</u>	<u>Cumulative Rate of Fatherhood</u>
14-15	6	1	1
16	12	2	3
17	35	6	9
18	60	10	19

Figure 4.3.1 Teenage Fatherhood as a Function of Number of Risk Factors

