DEFLECTING MALTREATED CHILDREN FROM DELINQUENCY: CROSS-SECTIONAL AND LONGITUDINAL ANALYSES OF THE MEDIATING ROLE OF SCHOOL ACHIEVEMENT AND PARTICIPATION

REPORT TO THE NATIONAL CENTER ON CHILD ABUSE AND NEGLECT

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EXECUTIVE SUMMARY

INTRODUCTION AND PROBLEM STATEMENT

This project analyzes the mechanisms by which child abuse and neglect influence juvenile delinquency. We are not persuaded that abuse and neglect irretrievably set children on the path to delinquency and criminality. Rather, we believe this path is highly contingent on intervening experiences. We hypothesize that abuse and neglect exercise their influence through the processes by which children normally are socialized to adult roles and integrated into the adult society. Many of the most important processes take place in school where success orients the child to conform to adult role expectations and increases the chances of adult success through conventional, noncriminal behavior. Our conceptual model, then, is a three-stage process in which child maltreatment affects school performance which affects delinquency. To the extent that this process specifies the mechanism properly, we should find a much diminished net or direct effect of abuse and neglect on delinquency.

RESEARCH DESIGN AND PROCEDURES

The heart of our research design is the comparison of the delinquency rate of maltreated children with that of other children, controlling for their school performance. We use two groups for comparison, first, school children in general and, second, children receiving social services for any reason. These comparisons require random samples of these three groups of children. All data were collected in Mecklenburg County, North Carolina, the state's most densely populated county.

The maltreatment sample was drawn from the North Carolina Central Registry of Child Abuse and Neglect. We sampled 2219 children who had been reported as abused or neglected from 1983 to 1989. The school comparison sample consisted of 388 children who attended the country's public schools in the same period. The social services sample was 280 children who had received services during the period from 1986 to 1989, for any reason, usually due to poverty.

For each child in our samples, we searched the records of the public school system and the juvenile court and coded all available data. For the maltreatment sample we coded all pertinent data on their abuse and neglect history from the Central Registry. We searched the Central Registry for children in the comparison samples and excluded from the analysis children in the social services sample who had any report of maltreatment in North Carolina. We did not make this exclusion for the school comparison sample in order to maintain it as representative of the general population of school children.

In the past, studies of the consequences of maltreatment have restricted themselves to children with substantiated or founded cases of maltreatment. Over 55 percent of maltreatment reports, however, are not substantiated by child welfare investigators. Our data include both substantiated and unsubstantiated reports. We have compared the school performance and risk of delinquency of children with substantiated reports and those with only unsubstantiated reports. For the most part, there is no difference. In this report, therefore, we include in the maltreatment sample children with any report of maltreatment, even if no report was substantiated.

Our analysis has three steps. We examine in turn the relationships between maltreatment and delinquency, maltreatment and school performance, and maltreatment and delinquency, controlling for school performance. Each step has two parts. In the first part, we examine the relationships cross-sectionally, encompassing in single measures the child's entire maltreatment, school, and delinquency history. This part of the analysis relies on comparisons of maltreated children with the school and social services samples in order to isolate the effect of maltreatment. We use Ordinary Least Squares and Logistic Regression in this part. In the second part of each step, we approach the relationships with an explicit longitudinal focus. This part compares periods of time in the life of maltreated children when they were and were not maltreated in order to discover the effects of maltreatment. In this part we use event-history analysis (SAS's Proc Lifereg).

FINDINGS

Maltreatment and Delinquency

Until recently studies of the effect of maltreatment on delinquency relied on retrospective designs that inflated the effect. Recent studies, using appropriate prospective designs, have found significant but much smaller effects. We continue in this tradition.

Our examination of the maltreatment-delinquency relationship focuses on overall delinquent complaints, and complaints for violent, property, and status offenses. For each dependent variable in this part of the analysis we assess the effects of type of maltreatment and number of substantiated reports on the risk of delinquency in comparison, first, to the school sample and, second, to the social services sample. We control for race, gender, age, family structure, and poverty program placement.

The cross-sectional maltreatment sample-school sample comparison suggests that maltreated children are at a significantly elevated risk of overall delinquency. The number of abuse reports, the number of neglect reports, and the total number of substantiated reports have independent and statistically significant effects. Type of maltreatment (physical abuse, sexual abuse, neglect) is not associated with specific types of delinquent behavior (violent offenses, property offenses, status offenses), although maltreated children with substantiated reports are at a significantly elevated risk of violent, property, and status offenses.

The cross-sectional maltreatment sample-social services sample comparison suggests findings somewhat different from those indicated above. The number of neglect reports does not place maltreated children at significantly elevated risk of overall delinquency, but the number of abuse reports and the number of substantiated reports do. Taken together, number of neglect reports and number of abuse reports do not improve the fit of the model over that accounted for by the background variables alone. However, number of substantiated reports of maltreatment does. We conclude that maltreated children with substantiated reports of maltreatment are at higher risk of overall delinquency than their social service counterparts. Maltreatment type is not associated with violent, property, or status offending. Although the number of substantiated maltreatment reports is a statistically significant correlate of each delinquent type, it significantly improves the fit of the model only for violent and status offending.

The longitudinal event-history analysis indicates that maltreatment has an overall effect on each of the types of offending examined (excluding violent offending here because of its extreme rarity). Overall, the most important maltreatment variables are age at first report and number of prior abuse reports. Number of neglect reports is a significant predictor only of property offending. Number of substantiated reports is the only maltreatment characteristic examined that predicts status offending.

Maltreatment and School Performance

Studies of the effect of maltreatment on school performance are much less common than studies of the maltreatment-delinquency link, and prospective research designs are even rarer. The best, recent studies find maltreatment effects on some but not all school outcomes.

We distinguish school achievement outcomes, including California Achievement Test (CAT) scores, grade point average, and dropping out after reaching age 16, from school process outcomes, including absenteeism, elementary school behavior problems, retention in grade, and special program referral and placement. The cross-sectional analysis compares maltreated children with school children in general and with children receiving social services. In comparison with school children in general, maltreated children are at risk of poorer school achievement on all three measures, but only on special program referral among the school process measures. The numbers of abuse and neglect reports are the key predictors. Maltreated children's school performance is not significantly different from the social service sample on any measures.

The event-history analysis presents a somewhat different picture of maltreatment effects on school performance. Here, maltreatment negatively impacts all school performance outcomes except the risk of dropping out. Thus, we have some indication that maltreatment is important not only for school achievement but also for school process outcomes. The numbers of abuse and neglect reports, especially the latter, have regularly significant effects. Age at first reported maltreatment is significant for some school outcomes. The number of

substantiated reports is almost never significant and the number of recent maltreatment reports is only occasionally significant.

Maltreatment Effect on Delinquency, Controlling for School Performance

Thus far the analyses have determined maltreatment's detrimental effects for both the risk of delinquency and poor school performance. We now seek to determine if adequate school experiences can deflect the maltreated child from the path toward delinquency. We know of no previous studies addressing this question.

Grade point average, absenteeism, and elementary school behavior problems reduce the effects of maltreatment on delinquency. Once these are taken into account, physically abused children are not at a significantly elevated risk of delinquency. The effect of neglect, while reduced in magnitude, is still statistically significant. While the difference in significance levels may be due to the greater number of children suffering neglect, it may also reflect a greater sensitivity of physically abused children to school outcomes. The difference in findings between physical abuse and neglect should not be overdrawn, however. The magnitude of each coefficient is reduced substantially with the introduction of the school performance variables, over a quarter for neglect, and over 35 percent for physical abuse. By this standard, the association of maltreatment and delinquent involvement is mediated by school performance for both neglect and physical abuse.

CONCLUSIONS AND POLICY IMPLICATIONS

The finding of a mediating role for school performance in the maltreatment-delinquency relationship has both hopeful and moderate policy implications. The potential of schools as intervention sites derives from the concentration of children in them, which allows scarce resources to be stretched farther, and from their public character, which makes state intervention more acceptable. Still, the strong roots of many problems at school in problems at home mean that interventions in school, though promising, will be quite difficult.

Our findings, while hopeful and suggestive, are far from definitive. Unmeasured correlates of maltreatment that raise delinquency rates could engender high rates even with an intervention to improve school performance. These factors include both time-stable individual differences on the one hand and the social contexts and social experiences that can influence behavior throughout the life course on the other. These or other unmeasured correlates may specify processes by which maltreatment adversely impacts delinquent involvement and school performance. To this extent, our effect estimates would not be biased. It is possible, however, that maltreatment and such correlates are actually all symptoms of an underlying factor. To this extent, our estimates would have ascribed the effects of this underlying factor to maltreatment. If this underlying factor also lies behind school performance and/or delinquency, its omission here, unavoidable due to data constraints, means that our conclusions are based on spurious relationships. We feel confident, however, that the process

we have specified and tested here is an important one and should be addressed by the relevant agencies. In particular, departments of social services, juvenile courts, and the schools should coordinate their efforts on behalf of maltreated children, including the sharing of information. Moreover, they should experiment with school-based interventions targeted on maltreated children to decrease absenteeism, raise grades, and reduce elementary school behavior problems.

CHAPTER 2
INTRODUCTION

This report analyzes the mechanisms by which child abuse and neglect influence juvenile delinquency. We are not persuaded that abuse and neglect irretrievably set children on the path to delinquency and criminality. Rather, we believe this path is highly contingent on intervening experiences. We hypothesize that abuse and neglect exercise their influence through the processes by which children normally are socialized to adult roles and integrated into the adult society. The most important of these processes take place in school where success orients the child to conform to adult role expectations and increases the chances of adult success through conventional, noncriminal behavior. Our conceptual model, then, is a three-stage process in which child abuse affects school performance which affects delinquency. To the extent that this process specifies the mechanism properly, we should find a much diminished net or direct effect of abuse and neglect on delinquency. (In the remainder of this report, we shall use the short term "maltreatment" to refer to all types of abuse and neglect, unless otherwise specified.)

Most scholars and policy makers assume that the overall effect of maltreatment on the risk of delinquency is positive and that the effects in the process via school performance are both inverse; that is: (1) the greater the maltreatment, the poorer the school performance; and (2) the poorer the school performance, the greater the likelihood of delinquency. These effects are our focus, as well.

Though the research literature, to be reviewed in the following chapters, consistently supports the latter assumption and usually supports the two former assumptions, the data and research designs on which these literatures are based are often insufficient to carry the conclusions reached. In any case, one of the purposes of this study is to investigate the hypothesized effects in the process with much better data and analytic methods than have been available and used to date.

If our hypothesis that maltreatment's impact on delinquency operates to a significant extent via school performance proves correct, the policy implications are substantial. Efforts to decrease the incidence of child abuse by interventions in the abusive family have encountered substantial legal and logistical problems. Without intending in any way to argue against efforts to decrease the incidence of maltreatment, we suggest that delinquency due to maltreatment may more effectively and efficiently be diminished by improving maltreated children's school performance. The mandatory attendance law assures long-term access to most maltreated children, and these children are physically far more concentrated in schools than in their families, which reduces the cost of interventions to help them. If, as hypothesized, school success reduces the likelihood of delinquency, then interventions to improve the school performance of maltreated children should reduce their probability of delinquency.

That abuse or neglect may put children at greater risk of poor school performance does not erect insurmountable obstacles to raising their school performance.

PREVIOUS VERSUS PRESENT RESEARCH METHODS

What we at any time do or do not know about the causes and effects of maltreatment is dependent upon the available data. However obvious, this is important to our study of maltreatment, school performance, and delinquency. Accurate assessments of this important social problem require high quality data that result from careful conceptualization and measurement. In turn, these data must be examined, manipulated, and analyzed in ways that rule out both the potential contaminating effects of other correlates of poor school achievement and delinquency and also lend credibility to causal claims. For some time, researchers and practitioners have been aware of the conceptual, definitional, and methodological deficiencies of most studies and the questions that remain to be answered concerning the maltreatment-delinquency relationship.

While many studies strongly suggest a clear and simple link between maltreatment and delinquency, they need to be viewed with caution. As a whole, this area of study is beset with conceptual and methodological problems (Howing et al. 1990; Lamphear 1986; Widom 1988). First, delinquency is often so broadly defined that a child's complaint over the hour for bedtime could place the child in the delinquent category (incorrigible).

Second, the delinquent population most studied is children confined to detention centers or training schools. These children are not representative of delinquents in general. Such children are only a fraction of those known to the court and of children served by the many community-based or diversion programs for younger and less serious offenders. Consequently, official delinquency records often tell us as much about the behavior of criminal justice agencies as they do about the behavior of children.

Third, self-reports of maltreatment and delinquency do not necessarily fare much better. Children's self-reported delinquent behavior and evaluations of their home life may not be accurate assessments of the situation, and the researcher's interpretation of those evaluations may also be skewed. The difficulty is not in the use of self-reports per se, but rather that these reports are seldom confirmed by any follow-up.

Fourth, studies that use appropriate comparison groups, a method necessary to confirm whether the abused group is any more likely than the comparison group to be involved in delinquency, are clearly the exception. When appropriate comparison groups are used, the research suggests that the strength of the hypothesized link between abuse and criminal involvement "may be of less magnitude than some might have expected" (Widom 1989a, p.267). More rigorous statistical designs yield findings that do not strongly support the

abuse-delinquency or "violence breeds violence" hypothesis (Widom 1989b; Zingraff, Leiter, Myers, and Johnsen 1993).

Fifth, retrospective research designs characterize most of this research. This may very well predispose finding a strong relationship between maltreatment and delinquency. In these studies the abuse history of a delinquent sample is reconstructed. Large proportions of these samples of delinquents prove to have been abused (see Lewis, Mallouh, and Webb 1989 for a review of such studies reporting high rates of abuse). This does not answer the question, however, does abuse cause delinquency? At the very least, this question requires a prospective design that assesses the delinquency rate of a sample of abused children in comparison to that of a non-abused sample. Such studies, while much rarer, generally reveal considerably smaller relationships, as low as five percent in Gil's (1970) assessment of the proportion of children reported as abused who had appeared before juvenile courts on other than traffic offenses.

Sixth, many of these studies show problems of causal logic, as well. A careful reading of the literature fails to convincingly demonstrate any more than the coterminous nature of social problems. It is quite possible that maltreatment and delinquency or maltreatment and poor school performance characterize the same children because they are both "caused" by a similar set of conditions (Zingraff and Belyea 1986). Marital discord, single-parent households, or poverty, for example, may very well induce both, leading to a spurious observed relationships. Multi-variate analyses are absolutely critical in order to avoid ascribing causal significance to spurious relationships.

Finally, causal inferences really require data and analysis that measure and model purported causes and effects over time. The overwhelming preponderance of research on the maltreatment-delinquency relationship, however, is cross-sectional in either its data or its analysis or both. We know of no explicitly longitudinal studies of the impact of maltreatment on delinquency, and even rudimentary longitudinal studies of the impact of maltreatment on school performance are just starting to appear in the literature (Eckenrode, Laird, and Doris 1993; Kurtz, Gaudin, Wodarski, and Howing 1993).

Recently, leading students of the consequences of child maltreatment have directly addressed these two major issues: methodology and questions remaining to be answered. Widom (1988) identifies several basic conceptual and methodological problems in much of the research, and she offers recommendations for future research. Garbarino (1989) informs us of what we currently do know, think we know, and do not know about the effects of maltreatment on delinquency. Our research, to be reported here, fares well given their evaluations and recommendations, primarily because of the strength of our data.

Widom (1988) notes the following problems with much of the current abuse research:

1. Studies show little consistency in categorizing abuse and neglect. They variously combine abuse and neglect in one category, separate abuse and neglect, and combine sexual and physical abuse, rarely delineating the types fully. This may very well mask important effects. Widom argues, moreover, that we must be aware of the possibility that different social categories (e.g., females) may suffer different forms of abuse and may respond differently to the same type of abuse. Where appropriate and possible, we examine separately physical abuse, sexual abuse, and neglect.

2. Most studies focus on abuse and neglect by familial or household caretakers. Abuse and neglect at the hands of persons outside the home are often ignored. Our data cover maltreatment by natural parents, step-parents, grandparents legal guardians and any other adults.

3. Several studies restrict the sample to those children who live with both biological parents. Such restrictions miss the great number of children living in single parent households, where abuse and neglect are as likely to be found as in intact homes. Our data include the living arrangement of our abused and neglected sample. This will allow us to include maltreated children in the full range of family structures in our analysis.

4. Widom argues, further, that we need to know the number and seriousness of abusive episodes. We should reasonably expect children who have suffered chronic abuse and neglect to be more traumatized than children who have experienced a single instance of abuse or neglect. Our study captures all abuse and neglect reports for each child in our maltreatment sample during a six year period. This will allow us to determine whether the consequences of abuse differ with the number of incidents.

5. Official data must be used with caution, but their use is warranted. Official agency reports indicate that the "cases were serious enough to come to the attention of authorities" (Widom 1989a, p.256). They do not have "the interpretive and subjective problems associated with interviewing someone after the fact" (Alfaro 1981, p.177). By using for our analysis abuse and neglect cases, officially recorded in the state's Central Registry of Child Abuse and Neglect, we know that 1) there was an alleged incident, which 2) someone thought it serious enough to warrant reporting.

6. Most research samples children from the case files of social services agencies, juvenile courts, detention centers, or hospitals, and then retrospectively attempt to identify prior abuse and neglect episodes. This gives an untrustworthy, perhaps even inflated (Garbarino 1989), assessment of the relationship between maltreatment and its consequences. As it is the consequences of the abuse that typically bring children to the attention of these agencies, maltreated children who do not have agency files may be expected to have suffered less severe consequences. The design of our study is prospective. We begin with a sample of maltreated children and track them through school and juvenile court.

7. Widom summarizes her main methodological concerns by asserting that future research must a) use explicit criteria in the definition of abuse and neglect, b) use validated cases, c) examine the effects of different forms of abuse/neglect, d) identify appropriate control or comparison groups, and e) statistically control for other known correlates of the criterion variables. Our data and design meet each of these requirements for substantial methodological improvement in research on the consequences of child abuse and neglect and add longitudinal analyses of substantial significance besides. We do, however, depart from past practices and from Widom's prescriptions by including maltreatment reports that have not been substantiated on investigation by a child welfare worker. We explain our justification for this innovation in Chapter 3 and believe it extends the coverage of this study to as broad population of maltreated children as official records will allow.

Garbarino (1989) points out substantive gaps in our knowledge about the consequences of maltreatment for delinquency. He notes that 1) there is no simple cause- effect relationship between abuse and delinquency. Abuse can be a cause or a consequence of delinquency; 2) no research indicates the percentage of delinquents who experienced abuse and neglect prior to their delinquency; 3) no research focuses on the relationship between abuse and delinquency recidivism; and 4) while research does suggest that a large number of runaways have been abused, no studies have determined the proportion of abused children who leave home while under age. Our research addresses each of these substantive gaps, because the data include full longitudinal accounts of maltreatment, social services interventions, school performance, and contacts with the juvenile justice system.

In addition, our data will allow us to focus either here or in future analyses on many of the important research questions noted by Garbarino: How do children break out of the abuse-delinquency cycle? Can adequate school performance and the resulting positive relations with teachers serve as the supportive relationships with non-abusive adults that research shows as essential to breaking the cycle? What else might interrupt the link? Can it be early detection and intervention? What stressful situations may lead to both abuse and delinquency? Does the maltreatment-delinquency link operate differently for different groups (e.g., by gender or race)? Do different types of maltreatment contribute to different types of problem behavior?

Finally, Garbarino states that "the prospective research needed [to answer these questions] is tough and requires long-term commitment" (1989: 74). We believe that we have executed a research design that meets Garbarino and Widom's prescriptions. We have taken great care and time to create a data set that overcomes the conceptual and methodological problems characteristic of this area of study, is prospective in approach, uses appropriate comparison samples, calculates adequate multivariate statistics to determine the net effects of abuse and neglect on school performance and delinquency, and breaks new ground with explicitly longitudinal analyses.

OVERVIEW OF THE REPORT

The following chapters report the details of our data collection and analysis. Chapter 3 lays out our basic analysis plan, the data we assembled for the analysis, and the special approaches this data collection and analysis have required. The succeeding chapters give our analyses of the relationships among maltreatment, school performance, and delinquency. Chapter 4 delineates the effects of maltreatment on the risk of delinquency overall and desegregated into property offenses, violent offenses, and status offenses. Chapter 5 examines maltreatment effects on numerous aspects of school performance, both with regard to achievement and process. Chapter 6 analyzes the indirect link between maltreatment and delinquency via school performance, evaluating the proposition that maltreated children who do not show unusual problems in school are not at an increased risk of delinquency. Thus, this chapter compares the indirect effect via school performance with the direct effect net of school performance. If hypotheses regarding the importance of this indirect linkage are born out, poor school performance may account for a significant portion of the tendency for maltreated children to become delinquent. In each of the analysis chapters (chapters 4-6), we first compare outcomes for maltreated children with those for our comparison groups; then we analyze the sequence and timing of maltreatment and the hypothesized consequences. Finally, Chapter 7 draws together our main findings, reaches conclusions about their significance, and points to their implications for practical steps on behalf of maltreated children and their communities.

CHAPTER 3
DESIGN OF THE STUDY

OVERVIEW

The main analytic objective of this research is to test the hypothesis that good school performance mitigates any adverse effect of maltreatment on subsequent delinquency. The policy objective that follows directly from testing this hypothesis is to determine if interventions to improve school performance might interrupt the impact of abuse or neglect on delinquency.

The analysis proceeds in two phases that address the main objective with different strengths. The first phase uses cross-sectional comparisons of maltreated children and comparison groups. The second phase uses a longitudinal analysis of maltreated children only.

Each phase has two steps. The first step estimates the total impact of abuse and/or neglect on the risk of delinquency in order to distinguish the effects of maltreatment from other disadvantaging background factors. The second and most central step is to separate this total effect of maltreatment on delinquency into: (a) the indirect part due to the effect of maltreatment on school performance and the subsequent effect of school performance on delinquency; and (b) the direct part that remains after taking account of the indirect effect via school performance. The larger the indirect part, the greater the potential for school interventions to diminish the effect of abuse and neglect on delinquency.

Almost inextricable from these two steps are the two other analytic and policy objectives of this study:

1. To determine if abused and/or neglected children are, indeed as conventionally believed, at risk of poor school performance;

2. To specify the dimensions of maltreatment (e.g., type, chronicity, age at onset) that identify maltreated children most at risk of delinquent involvement and poor school performance.

The data requirements for carrying out these analyses are met with three random samples: a large sample of children reported to the North Carolina Central Registry of Abuse and Neglect as abused or neglected in the study county from 1983 to 1989 (maltreatment sample); a smaller comparison sample of children served by the Department of Social Services in the same county but not reported to the Central Registry (DSS comparison

sample); and an additional small comparison sample of school children from the study county (school comparison sample).

The data collection has been funded largely through research grants awarded to the principal investigators by the North Carolina Governor's Crime Commission for collecting and analyzing the data (Grants 180-187-03-J093 and 180-188-D3-J093). The extensive analyses reported here have been supported by a grant from the National Center for Child Abuse and Neglect (Grant 90CA1455/01,02).

STUDY SITE

Our design focused on children from one county in North Carolina. We recognize that this single location approach has drawbacks for statistical generalization, but our data requirements have left us no option. We needed to track individual children through the records of several agencies, each of which maintains its records separately. In the absence of coordinated state-wide inter-agency record keeping, we had to do the tracking and matching ourselves. This led us to a single county design. This decision had the advantage of allowing us to concentrate our resources so as to locate hard-to-find children who would have been lost in a more dispersed study design.

The data all concern children in Mecklenburg County, North Carolina. Because this is the most populous of the state's counties--it includes Charlotte, North Carolina's largest city--this county more poorly represents North Carolina than would a rural county. It should, however, represent the urban settings in which most people in the U.S. live.

Aggregate statistics concerning child maltreatment, school performance, and delinquency allow comparison of Mecklenburg County to North Carolina as a whole. In the typical 12 month period stretching from 1987 to 1988, 1431 children in Mecklenburg County were reported to the North Carolina Central Registry of Child Abuse and Neglect as having been abused or neglected. Of these, the abuse or neglect of 612 children (42.8 percent) was substantiated upon DSS investigation. These figures constituted 4.38 and 5.04 percent of state totals, respectively. As the county's 1983 estimated population was almost 7 percent of the state total, the county's incidence of reported and substantiated child abuse and neglect was somewhat below average for the state as a whole.

In the 1987-88 school year, the Charlotte-Mecklenburg Schools had an average daily membership of 74,145. Of these, 39.2 percent were black, compared to a state-wide black proportion of 30.3 percent. The proportion of the county's 1983-84 ninth graders who graduated in June, 1987, correcting for in and out migration was 72.9 percent, which compares favorably with the state figure of 68.7 percent. At the end of 1987, 15.3 percent of the county's school children had individual education plans that placed them in special programs, the most numerous being programs for the academically gifted, the learning disabled, and the speech or language impaired. This figure virtually matched the state-wide

figure. The county spent $3578 per pupil in 1986-87, ranking fourteenth in the state (North Carolina Board of Education 1988).

The Mecklenburg County juvenile court's activity resembles that of other urban counties in the state. In 1986-87, this court filed 27 percent of all juvenile petitions filed in the state's six most urban counties. Of these 1889 petitions, nine percent alleged abuse or neglect. That same year it heard 26 percent of the juvenile cases in these six counties and dismissed almost half of the petitions it filed (North Carolina Administrative Office of the Courts 1988). These percentages compared closely with the 25 percent of these counties' 1980 population ages 5-17 accounted for by Mecklenburg County (North Carolina State Data Center 1984, p. 10).

SAMPLES

Maltreatment Sample

The central sample for this study was drawn from the North Carolina Central Registry of Child Abuse and Neglect (Registry), maintained by the state's Division of Social Services. The Registry has been computerized since October, 1983. This determined the temporal limit of our population of children. From that date until the data were delivered to us at the end of June, 1989, 166,973 reports of child abuse or neglect were made to the Registry, 8051 from Mecklenburg County. These reports concerned 6945 distinct children. Of these children, we randomly sampled one-third or 2315. [Note that this sample is a large enough proportion of the population from which it was selected to require adjustment of significance levels by the "finite population correction" (Kish 1965:45): the significance level calculated under usual assumptions will understate the statistical significance under the present conditions by a factor equal to 1 minus the sample size (n) divided by the population size (N).]

In these analyses we move away from heretofore standard practice by including in the maltreatment sample children with only unsubstantiated reports along with children with substantiated reports. The substantiation decision is made by the county DSS after investigation of the reported maltreatment. Earlier studies using state registries as their data source have generally included only children with at least one substantiated report. These studies have taken the substantiation decision at face value as distinguishing real from insubstantial or fabricated maltreatment. Skeptical that the substantiation decision may reflect a considerably more complex set of influences than simply the character of the maltreatment, we analyzed the school and delinquency outcomes of children from the maltreatment sample according to the proportion of their maltreatment reports substantiated and controlling for other possible influences. For the vast majority of the outcomes considered, the proportion of the reports substantiated had no statistically significant effect (Leiter et al. 1994). This leads us to include children with only unsubstantiated reports in the maltreatment sample for these analyses. As a conservative measure, we include proportion of reports substantiated as a predictor variable.

Comparison Samples

For comparison with the maltreatment sample, we drew smaller samples of the general school population, the total child case load of the local DSS, and the full list of children about whom complaints had been filed with the county juvenile court. The 388 student school comparison sample was drawn so that each child who had been enrolled at anytime during the period from the 1983-84 through the 1988-89 school years had an equal chance of selection. This ranged potentially from very young children who entered kindergarten in the 1988-89 school year to students who graduated from high school after the 1983-84 school year. The former students were just born at the beginning of our study period in October, 1983. The latter students were as old as 23 years by the time our study period ended in June, 1989.

The 281 children from the DSS comparison sample were drawn from two lists of children receiving services from the Mecklenburg County DSS. Both lists were restricted to recipients of services after 1986, the date at which the N.C. Division of Social Services adopted its present record keeping system. Only children born from October, 1970 through October, 1983 were included in the sampling frame in order to match them to the ages of school children in the abuse sample. The first list was an unduplicated compilation of the 8650 recipients of AFDC, Medicaid, and Foodstamp services. The second list was the 1003 recipients of protective services, foster care, adoption services, counseling, and subsidized day care. The two lists were randomly sampled at a common sampling fraction of .031 to yield an overall sample comprised almost 90 percent from the first list. The sample includes no duplicates from the two lists, although this was possible. The DSS sample represent children from environments that are adverse for more general reasons than faced by the children in the maltreatment sample. Moreover, due to the heavy contribution of poverty-based cases to the juvenile DSS case load, as reflected in this sample, the DSS comparison sample can effectively be interpreted as representing impoverished DSS clients.

The 490 children from the juvenile court comparison sample were selected from the original log books of complaints to the Mecklenburg County Juvenile Court. Since complaints against those older than 16 go through the criminal judicial process, we restricted ourselves to complaints from 1986 and later and hence to children who would not have turned eighteen and had their records purged before our data collection. We estimated, using a sample, that the total complaints during this period involved 5904 children. Since the Chief Court Counselor told us and our sample ultimately confirmed that about 20 percent of the complaints are dismissed before a petition is filed and half of the petitions actually filed are diverted from the court, we oversampled 600 children at a one in ten sampling fraction, of whom 110 were dismissed before a petition was filed, to yield about 490 actual court histories. Since the ultimate dependent variable in the analyses presented here is delinquency, we do not use the court comparison sample where delinquent involvement is a constant in these analyses.

Children in the school and DSS comparison samples may also have been maltreated. For our analysis this means that small differences from the maltreatment sample in these samples' school performance and delinquent involvement could be due to contamination of the comparison samples with maltreated children. To examine this possibility we checked each child in these comparison samples against the full Central Registry for all counties in the state. We discovered that 4.9 percent of the school comparison sample and 21.4 percent of the poverty sample had one or more reports of maltreatment. Our analytic approach is twofold. First, to preserve the representativeness of the school comparison sample, we include any child who fell into the school sample, even if they have been maltreated. One of these fell by chance into both the maltreatment and school samples. Second, to sharpen the comparison of the effect of maltreatment with the effect of a generally adverse environment, we remove from the DSS sample any child with a substantiated maltreatment report. This includes the sixteen children randomly selected in both the maltreatment and DSS samples.

Collecting the data involved searching for and, if found, coding the school and juvenile court records of each member of the four samples. School records of children who had graduated or otherwise left the Charlotte-Mecklenburg Schools were generally located in a central repository, many on microfilm. Most of the records, however, concerned children who were currently enrolled or had only left recently; these were located in the school where the student was currently or most recently enrolled. Juvenile court records were centralized in the office of the Chief Court Counselor of Mecklenburg County. Histories of complaints, petitions, and dispositions were coded from a card file that the staff continuously updated.

Table 3.1 summarizes the sizes of the three samples and our success in finding and coding records. The rows labelled "Of school age with school records coded" tell the number of cases available for examining impacts on school performance (Chapter 5). The rows labelled "Of juvenile court age" tell the number of cases available for examining impacts on the likelihood of delinquency (Chapter 4). The rows labelled "Of juvenile court age with school records coded" tell the number of cases available for examining impacts on the likelihood of delinquency net of the effects of school performance (Chapter 6).

//Table 3.1 about here//

There is an important difference in the implications of not locating a sampled child's school records versus his or her court records. Not finding a child's school records meant "missing data" which, for whatever reason (from attendance at private schools to misfiled records in the public schools), makes the case unavailable for analysis. Not finding a child's juvenile court records meant that we counted that child among that large majority in all three samples who had no contact with the court.

We were most successful in locating school records for the school sample, which was drawn originally from lists maintained by the school system. Even for the other two samples, however, we recovered school data for the vast majority of children sampled, 80.5 percent for the DSS sample and 73.6 percent for the maltreatment sample. Sample attrition in these cases

is due to some unknown combination of lost or misfiled records, failure to register for school, and private school attendance.

The gender and race compositions of our respective samples are presented in Table 3.2. The sample of abused and neglected children is more than half African-American. A maltreated population that is minority white in a county that is 69 percent white (North Carolina State Data Center, 1984) is not surprising but still noteworthy. The school comparison sample, as expected, reflects the racial composition of the county. African-Americans and females again constitute the majority of the children in the DSS comparison sample, African-Americans overwhelmingly. To the extent that the DSS sample represents officially recognized economic hardship, it is noteworthy that the "feminization of poverty" seems to hit even children.

//Table 3.2 about here//

PROBLEMS AND SOLUTIONS

Confidentiality of Data to be Coded

The largest obstacles to research on the consequences of child maltreatment are the confidentiality of social service, school and juvenile court records, as well as the need to match social service, school, and juvenile court records for the same child. These problems are related. In our study, and we assume that this restriction would apply beyond North Carolina, certain Department of Social Services (DSS) data were available for coding, but only on condition that the names of the children not be divulged by the researchers to anyone. This seemed to mean that only the researchers could match the abused child's identity to a school or court file, a difficult but manageable task, and then code the school records. Under the provisions of the Family Educational Privacy Act (Buckley Amendment), however, school records cannot be viewed by non-school personnel, such as outside researchers, without informed parental consent. Parents accused of child abuse or neglect are not likely to give their permission for the review of their children's school records for the purpose of determining if maltreatment affects school performance or the likelihood of delinquency. This would appear to have blocked any effort to bring DSS and school data on abused children together.

Our solution, which we suggest may be practicable elsewhere if cooperative relations with DSS, school, and court officials are cultivated, was to have school personnel--in this case substitute teachers trained and supervised for coding by the researchers--locate and code the school records. The school board attorney was satisfied that this fulfilled the Buckley Amendment without requiring parental consent, but only if the child's name was removed from the coding form before it was returned to the researchers. This meant that school record coding had to come last after all other data on the child had been assembled. (For us, this meant both DSS data and juvenile court data.) We arranged for coding forms from each data

source on the same child to be stapled together. Once the data came back to us from the school coders, we knew each packet was about the same child, but we had no way to recover the identity of that child.

The school coders under this system met the confidentiality requirements for use of DSS maltreatment data if the school personnel did not know whether the particular child whose records they were coding had been reported as maltreated. This requirement was ironically met by our need for comparison samples. By recording the sample source from which the child's name had been drawn on the coding packet face sheet in a way the school coders could not decipher, we met the DSS requirement for the anonymity of their abuse and neglect cases.

Relying on Social Service Records of Abuse and Neglect

Many recent studies of abuse and neglect, including this one, in seeking large case bases for multivariate analysis rely on official records, which became much more common after the passage of the Federal Child Abuse Prevention and Treatment Act of 1974. Record keeping requires a definition of child abuse and child neglect, but even if official definitions were consistent across record keeping agencies, operational definitions of abuse and neglect used to decide whether to record the case probably reflect biases (Finkelhor and Hotaling 1984), resulting especially in the overrepresentation of the poor and racial minorities in official records of abuse and neglect (Newberger et al. 1977).

The problems of varying definitions and bias are particularly troubling when the analysis seeks to determine the incidence or distribution of abuse and neglect. This study instead investigates abuse and neglect as determinants of school performance and problem behavior, making our reliance on official records somewhat less damaging. In addition, we are in position to include variables in the analysis that will allow some adjustment for potential bias in reporting or recording cases of abuse and neglect. Specifically, we will control for race, receipt of public assistance on account of poverty, and proportion of reports substantiated, and compare children who have been reported to DSS as abused or neglected with children who are served by DSS for any reason, usually because they are poor. These controls and distinctions should reduce the risk of inaccurate conclusions about maltreatment effects due to bias in the official records we use. Still, we acknowledge that the DSS sample, from which we have attempted to remove maltreated children, may include children with unreported maltreatment. The effect on our analysis will likely be to make the school performance levels and delinquency rates of the DSS sample more like those of the maltreatment sample than they would be if all maltreated children were successfully removed.

Relying on Official School Records

While some researchers believe school personnel are unlikely to report suspected cases of child abuse and neglect, these same concerns are irrelevant here because we do not rely on educators for our abuse reports. Instead, for this study, school people report and compile

the school participation and performance data we are trying to explain in part with abuse reports. We do not claim that the standardized test scores and report card grades we use are without bias, only that the biases we encounter in using such data are widespread in educational research.

We are restricted by the logistics of large sample research to the use of official school records, including grades, standardized test scores, and attendance records. We recognize the desirability of teacher ratings, besides what they record as grades, and researcher observations of such variables as school adjustment (for example, see Calam and Franchi 1987). We believe, however, that we are on safe ground with our data and that much will be gained in making analytic distinctions that would be impossible without a large sample.

Relying on Official Juvenile Court Records

Some of the problems of relying on official school records apply similarly to the use of official juvenile court records and are familiar from the arguments in favor of self-reported delinquency data (Elliott and Ageton 1980). These problems must be accepted as a cost of large sample research. In addition, use of these juvenile court records carries with it other problems and require new approaches and adjustments. We had hoped to code social histories for which the Administrative Office of the Courts has furnished a form statewide, but these are rarely completed fully enough in the study county to be useful. Specific children's files were sometimes hard to locate between the central filing system, the individual court counselors' offices, and supervisors' offices. These problems seemed to reflect in part system overload. Fortunately, the court counselors kept a complete record of complaints, petitions, and dispositions in a separate cardfile. Once we had been instructed in the cryptic codes they use, we were able to capture most of the information we needed on the processing of complaints.

The chief court counselor in the study county, recognizing the dangers in the "delinquent" label and according to law, purges the records for two groups of children: (1) those against whom a complaint was made, but no petition and no subsequent complaint within 90 days was filed; and (2) those who reach their eighteenth birthday. The implication of losing the first group is that children from the maltreatment, DSS, or school sample may have had a complaint filed in juvenile court that we could not discover. This should not distort our findings badly because these lost records are for those children who have had the most minor of brushes with the juvenile authorities.

The purging of court records for the second group of children, who have reached the age of eighteen, leads to the likely underestimation of the delinquency of the older children in our maltreatment, school, and DSS samples. Indeed, the school and maltreatment samples include children who may have been verging on age of eighteen as early as the start of the study period in 1983, the DSS sample only in 1986.

Certainly, juvenile court records generally undercount delinquent involvement, and the systematic purging of these records specifically does so. Still, we have no reason to expect that this potential bias affected the maltreated and comparison samples differently. We realize, also, that offending behavior can carry over into the adult years, but that issue is beyond the scope of the present research.

Identifying Records to Code

School and court record coding could not proceed until the coder had ascertained and documented a "match" between the child whose records we hoped to code and the records in hand. We established fairly strict standards for matching. Allowing throughout for only single character or numeral typographical errors, we required that last names match unless social security numbers matched. Birth dates had to match if available. In the absence of birth dates, first name, middle initial if available, race, and sex had to match. Given a match on both last name and birth date, we required a match on at least one of the following: the first letter of the first name, the social security number, or both race and sex.

Selection into Multiple Samples

By chance, thirteen children were selected into both the maltreatment and DSS samples and one child into both the maltreatment and school samples. No children were selected into both the DSS and school samples. Where we are analyzing the samples separately or comparing the same statistic across the various samples, we will treat the multiple sample cases as belonging to each of the samples into which they fell, in effect counting the same case twice in a manner analogous to that used when sampling with replacement. Where we are comparing the effect of sample source by dummy variable regression, we will assign the multiple sample cases to the maltreatment sample, reflecting our focus on abuse and neglect.

ANALYSIS PLAN

The ultimate policy-oriented question of this research is, Are maltreated children who do reasonably well in school at an elevated risk of delinquency? Translated into an analytic question, it becomes, What is the relationship of maltreatment with delinquent involvement, net of school performance? This analytic question implies the following set of analyses:

- the overall (total) relationship of maltreatment and delinquent involvement, which is the focus of Chapter 4.

- the relationship of maltreatment and school performance, which is the focus of Chapter 5.

- the relationship of school performance and delinquent involvement, which we do not analyze here because it is generally established in the literature (reviewed briefly in Chapter 6).

- the relationship of maltreatment and delinquent involvement, net of school performance, which is the focus of Chapter 6.

We undertake each part of the analysis in two parts, cross-sectional and longitudinal. Each has its advantages and drawbacks. Together they provide a full analytic picture.

Cross-Sectional Analysis

The strength of the cross-sectional analyses is the comparison of the maltreatment sample with each of the comparison samples as the method of assessing maltreatment's effect. The comparison with the school sample establishes the difference between maltreated children and the general juvenile population. The comparison with the DSS sample establishes the difference between maltreated children and children facing generally adverse environments, especially poverty.

Comparison of maltreated children with the two other samples carries with it a disadvantage. No variable can be used in this part of the analysis that does not have a logical value for all cases. This affects chiefly the measurement of maltreatment. Number of abuse reports and number of neglect reports have a meaning for non-maltreated children, but age at onset and proportion of reports substantiated do not. The latter must be excluded from the cross-sectional analyses.

The key weakness of our cross-sectional analyses is its inadequacy for inferring causation. This part of our analysis will allow us to talk about relationships between maltreatment on the one hand and school performance and delinquent involvement on the other, but not about the causal impact of maltreatment on school performance and delinquency.

As is generally recognized, cross-sectional analyses hide the temporal order of processes through which one factor causes another. Our cross-sectional analyses are no exception. The drawback here derives specifically from the necessity in the cross-sectional analyses of using child-level measures instead of time-referenced measures.

Child-level measures could be constructed in a number of ways from the full information we have collected. Each possible construction involves a choice between sacrificing information and sacrificing the time-referent. Several child-level analyses of maltreatment effects have sacrificed information in order to make the time sequence of events clear. Widom (1989a) restricted herself to maltreatment events before the juvenile court age. This approach allowed her to talk about the causal impact of maltreatment on delinquency but threw away information on maltreatment during adolescence in close proximity to delinquent

involvement. Eckenrode et al. (1993) used school performance at the time the study was conducted. This allowed them to talk about maltreatment effects on school performance but threw away information on earlier school performance the extent of whose similarity to the current levels, therefore, remained unknown. Kurtz et al. (1993) used maltreatment reports and school performance change scores over an eighteen month period. This allowed them to assess maltreatment effects on change in school performance but prevented examination of predisposing effects of earlier maltreatment and school performance.

Knowing that we will be able to make the time sequence of maltreatment and its hypothesized consequences clear in the longitudinal analysis, we have chosen to construct child-level measures for the cross-sectional analysis that use all available information. Our variables summarize the child's experiences across time, for example, total number of maltreatment reports, grade point average, and whether the child ever was the subject of a delinquent complaint. With these measures, we cannot speak with certainty about the time sequence of events and hence our capacity to make valid causal inferences in the cross-sectional analysis is weakened.

Nonetheless, we feel fairly confident in making tentative causal inferences from associations among our child-level summary measures. Our position is based on information that for most maltreated children, a substantial part of the years in school follows the onset of maltreatment and that for all children, the risk period for delinquent involvement follows most of the school years. We have assembled the following statistical data to support our position: first, of children with a known age for whom a report of maltreatment was made to the North Carolina Central Registry of Child Abuse and Neglect in the July, 1984 to June, 1989 period, 40.75 percent were under seven years old and 75.05 percent were under thirteen years old (North Carolina Division of Social Services 1987, 1992; see the review in Knudsen 1992, p. 56, p. 145 for corroboration from other studies that maltreated children tend to be young); second, in Mecklenburg County, North Carolina, where we collected our data, 69 percent of the children enrolled in the public schools in the 1987-88 school year had not yet entered high school (North Carolina Board of Education 1988, p. II-166); and third, 69 percent of delinquency cases nationwide involved a child at least 15 years old (Snyder et al. 1990, p. 70). Taken together, these statistics support a time ordering of our child-level data in which maltreatment precedes the bulk of school experience which in turn precedes most official complaints.

The cross-sectional analyses begin with comparisons of outcomes for each sample. This tells us whether there are zero-order differences in school performance and in delinquent involvement across samples. We follow with multiple regression analyses that estimate the effect of numbers of abuse and neglect reports by comparison first with being in the school sample (here omitting any children with maltreatment reports anywhere in the state) and then with being in the DSS sample. We estimate these effects with ordinary least squares regression for continuous outcome variables (e.g., grade point average) and logistic regression for categorical outcome variables (e.g., delinquent involvement). In these regressions, we include controls for race, gender, age, family structure, and poverty program participation.

Our overall measure of maltreatment's effect is the increase in model fit achieved by adding all maltreatment variables to an equation with background variables only. We will also examine the effects of specific maltreatment characteristics. We expect greater maltreatment effects in comparison with the school than the DSS sample. We would not be surprised in maltreated children were no more at risk of adverse consequences than children in the DSS sample.

Longitudinal Analysis

We follow the cross-sectional analysis in each chapter with a longitudinal treatment, using the event-history technique known as the method of piece-wise constants (Yamaguchi 1991). This method allows not only the dependent variable, but also independent variables, to vary over time for the same child.

The unit of analysis in our event-history analyses is not the child, as in the cross-sectional analyses, but the child-month, with months counted relative to the child's birth date. Some variables, such as gender, are constant for a given child regardless of the month in question. Some, such as how many neglect reports the child has experienced up to the month in question, are time-dependent. Some, such as family structure, are conceptually time dependent but are treated as constant due to data limitations. We demarcate the passage of time into months as a compromise between the daily units for which we have maltreatment report and delinquent involvement measures (e.g., date of report or complaint) and the annual units for which we have school performance measures (e.g., days absent in second grade).

In the longitudinal portion of the analysis, maltreatment's impact is estimated by observing the circumstances, measured by a configuration of independent variables, under which the child makes the transition from one state to another, for example, from non-delinquency to delinquency or from adequate school performance to inadequate school performance. The event history analysis tells us the effects of the independent variables on the probability of making this transition. Our overall question about maltreatment is, Do the maltreatment variables as a group improve our prediction of the transition in question over the prediction achieved with the background variables alone. We will also pay attention to effects of specific maltreatment characteristics.

In contrast to the cross-sectional analysis, the event-history analyses of maltreatment effects on the transitions to poor school performance and delinquent involvement has several advantages. The most important of these is the certainty that maltreatment events precede downturns in school performance. This means that we are not only conceiving of maltreatment as a cause but also measuring it as such. Where we discover significant maltreatment effects, we can now talk about them as causes, not just as associations, subject of course to continuing problems of spuriousness.

A second advantage is that we no longer have to rely on comparisons with nonmaltreated children, who may be quite different from maltreated children, including in unmeasured ways, to estimate the maltreatment effect. Instead, we compare times in maltreated children's school lives when they had experienced less and less serious maltreatment, or even no maltreatment, with other times when they had experienced more. Of course, comparison of maltreated children with other populations has real value that we will realize with the cross-sectional analysis.

A third advantage, which flows from restricting our attention to maltreated children, is that we can now include maltreatment characteristics that have no logical meaning for nonmaltreated children, such as age at first report of maltreatment.

A fourth advantage, related to the third, is that we can include characteristics of maltreatment that refer to specific time periods. A key example is the number of maltreatment reports about the child in question in the year prior to the month in question. This will allow us to distinguish maltreatment effects that relate to chronicity of maltreatment from those that concern proximity of maltreatment.

Finally, by examining data over distinct time periods, we can assess maltreatment effects on change in school performance rather than on overall levels. Instead of asking, is maltreatment associated with low levels of school performance, we can determine whether the advent or increase in the seriousness of maltreatment causes school performance to decline.

VARIABLES

Table 3.3 summarizes the variables that will be used in the subsequent analyses. It makes clear the differences in operationalization for the cross-sectional and longitudinal analyses. Operationalizations for cross-sectional analyses are constant across time. Those for the longitudinal analyses may be constant or vary across time.

//Table 3.3 about here//

Maltreatment

Throughout this study, we depend exclusively on maltreatment reports for measures of maltreatment. This, of course, incurs the unavoidable loss of data on maltreatment that is not reported. This loss would be quite damaging to a study of the incidence or causes of maltreatment (Giovannoni and Becerra 1979). In this study of the consequences of maltreatment, the loss is probably not as great. If we assume that, in general, reported maltreatment is more severe or more chronic than unreported maltreatment (Groeneveld and Giovannoni 1979), then the consequences of reported maltreatment are likely to be more serious than those of unreported maltreatment. At the very least, we are unlikely to

understate the consequences of maltreatment by operationalizing maltreatment with reported cases only.

Where many studies of maltreatment effects have simply compared children with and without substantiated maltreatment reports, this project has gathered data for a much more discriminating characterization of maltreatment. An important advance on many studies is counting abuse and neglect reports separately, enabling us to estimate the effects of abuse and neglect separately. If the report was substantiated on investigation, we classify it according to the judgment of the investigator. If the report was not substantiated, we must rely on the type of maltreatment reported. This incurs some risk of error, the magnitude of which we have estimated by comparing type reported and substantiated for the 438 substantiated abuse reports and the 657 substantiated neglect reports in our sample. One hundred thirty-three abuse reports were reclassified as neglect on substantiation. Six neglect reports were reclassified as abuse on substantiation. Overall, the risk of error in using type of maltreatment reported appears not too large and is largely limited to the risk of classifying neglect as abuse.

Abuse can take many forms. Substantiating investigators in North Carolina record physical abuse and sexual abuse but almost never emotional abuse. We have separately estimated the effects of physical and sexual abuse in our previously published work where we restricted ourselves to substantiated reports (Zingaff et al. 1993; Leiter and Johnsen 1994). In the present analyses, however, we include unsubstantiated reports for which type of abuse is undifferentiated. This means that our abuse reports category includes both physical, sexual, and emotional abuse reports. The greatest number are physical abuse reports.

Our second measurement advance over much previous research on the consequences of maltreatment is the sensitivity of our data to various aspects of the seriousness of maltreatment. Cicchetti and Barnett (1991) urged attention to the frequency of maltreatment, its duration, and age of its onset as key aspects of seriousness. We measure frequency by the numbers of abuse and neglect reports. We note that almost 79 percent of the maltreatment sample had only one report. We measure age at onset by comparing the birth date with the date of the first report. This variable tells at what stage in the child's socialization the maltreatment began. We have no measure for duration of maltreatment, but we approximate this concept in the longitudinal analysis the combination of age at onset and recency of reports. Recency of maltreatment, itself, may be an important aspect of the seriousness of maltreatment for some school and delinquency outcomes. We also include number of substantiated reports, which conventionally would be taken as adding information about seriousness, although our analyses, mentioned earlier (Leiter et al. 1994), do not support this assumption.

Delinquent Involvement

Official involvement in delinquency has been shown in some studies to significantly impact the likelihood of adult criminality (Stattin and Magnusson 1991), but this effect is clear only for chronic, serious delinquents (Wolfgang et al. 1987). Official delinquency outcomes are summaries of official reactions to problem behaviors. A substantial number of children who engage in youthful problem behavior (including criminal acts) are never eligible for the official designation "delinquent," because they escape detection. Some other children who do not escape detection still avoid the official designation because they are not adjudicated delinquent at the time of their hearing, their case is dismissed before a formal petition is filed, or they are diverted to a community-based program established for younger, first-time, or less serious offenders, entirely bypassing the official mechanisms of the court and thus outside the scope of most official juvenile court records.

Although we do use official court records, our measures of delinquent involvement are more inclusive of youthful problem behavior than is typical of official delinquency data because we measure delinquency at the earliest known point of contact with juvenile justice authorities--when a complaint is made to the juvenile court. In Mecklenburg County, the site of our study, a complaint must be filed any time a child is taken into temporary custody. Our use of complaints as our measure of delinquency involvement has the added advantage of securing information on complaints brought to the attention of the court by persons or entities other than police (for example, citizens, schools, Division of Social Services). Such complaints may well be for less serious offenses than those brought by the police, and are certainly fewer in number, but are important to our interest in examining the relationship between maltreatment and problem behavior. Complaints as a measure of delinquent involvement at virtually the start of the juvenile justice process has the final advantage of substantially avoiding processing bias (Johnson and Scheuble 1991; McCarthy and Smith 1986), which probably increases as a case proceeds further into the juvenile justice system. Complaints were coded from a central card file continuously updated in the office of the Mecklenburg County Chief Court Counselor.

School Outcomes

School outcomes have been found to have a profound impact on later life chances, including occupational status (Blau and Duncan 1967; Bielby 1981) and conformity to the law (Thornberry et al. 1985). Educational outcomes, thus, are central to consideration of the consequence of maltreatment both for proximate effects and the mediation of wide-ranging, long-term ramifications. We distinguish three types of school outcomes. Cognitive learning is the official goal of schooling. Participation is a precondition for such learning and for earning school credentials. Integration into the normative structure of the school is important for the socialization function of schooling and identifies the child as "normal."

Following both mainstream and radical research traditions in the sociology of education (e.g., Jencks et al. 1972; Bowles and Gintis 1976), we distinguish what students learn in school from the credentials they earn for staying in school. Both play a role in determining successful passage into the adult society. We measure what students learn, first, with mean standard (Z) scores on the California Achievement Test (CAT) across reading and mathematics (z-scores retrieved from percentile scores recorded in school records); and, second, with averages across annual grades teachers assign in reading/language arts/English, mathematics, social studies/history, and science (4=A).

Use of the CAT state-wide to assess individual progress and school performance indicates its acceptance for assessing learning in subject areas widely held to be important. Salvia and Ysseldyke (1985, p. 305) summarize as "very good" the evidence for the CAT's internal consistency (both sub-tests and total scores), test-retest reliability, content validity (via comparison of objectives with state department of education and large city curriculum guides and with two other tests), and racial, ethnic, and gender neutrality (through assessment by a panel of minority professionals; see also Marwit and Neumann 1974; Powers and Jones 1984).

Teacher ratings of student academic achievement have been shown to correlate well with standardized test results (Hoge and Coladarci 1989; Hopkins et al. 1985) and, therefore, to measure learning in widely-valued areas. In addition, teacher ratings tap distinct aspects of student behavior (Pedulla et al. 1980; Sharpley and Edgar 1986). Specifically, the grades teacher assign (following explicit school district guidelines--see Charlotte-Mecklenburg Schools 1991, section 5124.1) are more sensitive than is the CAT to school district, school, and individual teacher emphases and values in student achievement. In a longitudinal study of the reading and mathematics grades elementary school teachers give, Leiter and Brown (1985) demonstrated an association with CAT scores the student earns in the same subject the same year, suggesting that grades and CAT scores measure some of the same aspects of achievement. Further, they showed a continuity of grades one year with grades a different teacher gave the year before in the same subject, suggesting the impact on grades of relatively stable levels of student ability and learning. Finally, they found a particularly large overlap of the grade a teacher gave in one subject with the grade the same teacher gave in the other subject in the same year, suggesting a strong generalizing impact of classroom climate or teacher expectations. It is fair to say, then, that the CAT scores and grade point average together provide a meaningful assessment of a considerable part of what these students learn in school. Moreover, even to the extent that they fall short of full learning assessments, CAT scores and grades are very real in their consequences: the signals they give to students and the evaluative use others make of them shape motivation, aspirations, school continuation decisions, and occupational achievement (for example, see Jencks et al. 1979).

Obtaining the critical high school diploma requires some minimum of knowledge necessary for promotion, but beyond that depends on avoiding frustration with and alienation from school (Finn 1989) and the temptation of work so as simply to remain in school. We measure this motivation to progress toward high school graduation concept by its inverse, the

dichotomy dropping out or staying in school after reaching the age of 16 at which leaving school is legal.

We instructed coders to look for formal documentation or informal indication by the counselor that the student had dropped out or had transferred to another school district. Consistent with recent practice (Ensminger and Slusarcick 1992; Morrow 1986), students whose enrollment records ended after they had reached age 16 without graduation and without indication or suggestion of transfer were coded as having dropped out. Our coders' decisions were further checked to insure that children had turned 16 years old and hence were eligible to drop out. To derive dropout rates, we identified all children who were eligible to drop out when we last had school information for them.

The quality of drop out data has been criticized due to definitional and operational differences across school districts (Hammack 1986), but such problems should not affect our single district study. Instead, we must worry about the possibility that unusual instability in the families and home lives of maltreated children, including unemployment and marital dissolution (Baldwin and Oliver 1975; Krugman et al. 1986) artifactually inflates their measured drop out rate, especially by increasing the frequency of cross-district moves (unusual transience in families of maltreated children suggested by Garbarino 1976). On the other hand, analysis with these data of school changing within the Charlotte-Mecklenburg school system, which we do not report here in detail, reveal no differences across samples. Though not directly applicable to the question of cross-district transfers, this analysis of intra-district transfers is somewhat reassuring.

For younger students and on a day-to-day basis, continuing motivation to participate in school is measured by annual days absent (logged when used as a dependent variable in cross-sectional regression analyses), which includes components of sickness and truancy in some unknowable combination. Absenteeism has been shown to have an adverse impact on cognitive learning and the likelihood of graduation and delinquent involvement (Bond and Beer 1990; May 1975; Rutter et al. 1979; Weitzman et al. 1985). These impacts arise from the dual role of attendance in exposing children to instruction and as an essential step in integration into the normative structure of the school. Schools take special care in recording attendance, in part because resources are distributed to school districts and school as a function of attendance (North Carolina Department of Public Instruction 1992), and in distinguishing excused from unexcused absences, because state law governs the latter (Charlotte Mecklenburg Schools 1991, section 5113). Attendance and absenteeism records are, nonetheless, subject to important measurement difficulties, including inconsistent classroom recording procedures, errors in entering teachers' absence reports into office records, varying definitions of full and half-day absences, and failure to capture absences from individual class periods in official records. Overall, these inaccuracies lead to undercounting of absences (deJung and Duckworth 1986).

The dimensions of integration into the normative structure of the school include normal progress, normal placement, and acceptable behavior. Normal progress is measured by retention in grade while in the CMS. Retention in grade indicates academic failure, although behavior problems may be confounded with academic ones in the decision to retain a child. Jackson's (1975) review of studies on the effects of retention on achievement did not support the practice. Criteria and procedures for retention in the Charlotte-Mecklenburg Schools are very specific and detailed (Charlotte-Mecklenburg Schools 1991, section 5123), which should increase the likelihood of consistency in their application.

Normal placement is marked by its inverse, placement in one of the mandated special education programs, including placements for children identified with learning disabilities, behavioral or emotional handicaps, mental retardation, or physical or sensory impairments, but not including placement in a special program for children identified as academically gifted.

Loeber and Dishion (1983) and Spivack and Cianci (1987) have shown early behavior problems to predict later criminal behavior. Acceptable behavior in school is indicated, again by its inverse, as the number of check marks the teacher recorded on report cards (grades K-6 only) to indicate behavior problems. These include the three areas of "follows directions," "respects property and rights of others," and "observes school and class rules." Summary teacher assessments of student behavior, such as those involved in this measure, have been found generally to be valid (Hoge 1985). Coders counted mention of a problem on any report card as a problem for that year.

Undoubtably, learning, participation, and integration are related in reciprocal, cumulative, and self-reinforcing patterns. Moreover, these patterns may differ according to whether the child has been maltreated. In this study, we are only interested in the impacts of maltreatment on these school outcomes and, thus, do not consider these important interrelationships.

Background Variables

Controls for gender, race, age, poverty, parental education, parental configuration, and sibship size and density are important in subsequent multivariate analyses because they are well-established correlates of school and delinquency outcomes and may also be related to maltreatment. Omission of a variable that is associated with both independent and dependent variables constitutes a specification error that can bias the estimate of the effect of the independent variable on the dependent variable. Studies generally find better school performance and less delinquency in: girls than boys; whites than African Americans; children who are not poor rather than children who are poor; children with better educated rather than more poorly educated parents; children living with two parents rather than one or none; and children living with few rather than many other children. Children with more rather than fewer siblings close to their own age tend to have poorer school performance, but, to the best of our knowledge, this factor has not been explored for delinquency. Older children are at higher risk of delinquency than younger children, though the relationship of age to school

performance is more difficult to summarize (Astone and McLanahan 1991; Blake 1989; Brounfield 1986; Elliott and Ageton 1980; Elliott et al. 1983; Hill and Atkinson 1988; Huizinga and Elliott 1987; Johnson 1986; Kominski 1988; Loeber and Stouthamer-Loeber 1986; Murnane et al. 1981; Ousten 1984; Powell and Steelman 1990; Rankin 1983; Rutter 1980; Stockard et al. 1985; Thompson et al. 1988). In reporting these findings, we recognize, of course, that these trends reflect institutional response as well as individual behavior. This does not diminish the importance of controlling for these factors.

Several of these control variables require additional explanation. We have omitted the small of Asian, Native American, and Hispanic children in our samples from the analyses. Their numbers are too small to analyze separately, but taken together they do not constitute a meaningful group. Thus race is a white/African American dichotomy. Family structure, number of other children in the household, and sibship density are based on information coded from the school registration form and, therefore, is available only for children with school records. This form is completed at the time the child first enrolls in the Charlotte-Mecklenburg Schools. Updated information was not available, so we have no choice but to treat these time-varying factors as constants over time. This introduces measurement error, which has the effect of attenuating associations. Poverty is measured in terms of participation in a public assistance program for which a maximum income was an eligibility criterion. This is a narrow definition of poverty. The data come from state Division of Social Service records which were searched for matches on name, date of birth, race, and gender.

Data on parental education was available for some children from the same school registration forms that yielded other family information. Parental education, however, was missing on many of these forms. Standard list-wise deletion would have resulted, therefore, in the loss of many cases from our analyses. We have decided to omit parental education from our analyses, relying on the race and poverty variables to tap socio-economic status.

OVERVIEW OF THE ANALYSIS

The analysis is planned around three causal hypotheses, two questions that can be asked about each hypothesis, and two critical comparisons. The hypotheses derive from our review of the literature, though we have serious reservations about the conclusions often drawn. The hypotheses build toward our central interest in the potential mediating role of school performance in the relationship between maltreatment and delinquency.

Hypothesis 1: The greater the maltreatment, the higher the probability of delinquent involvement.

Hypothesis 2: The greater the maltreatment, the worse the school performance.

Hypothesis 3: The better the school performance, the smaller the relationship between maltreatment and delinquent involvement.

We plan to analyze each of these hypotheses from the perspective of two general questions. First, most globally, and most simply, is the hypothesis true for maltreated children, in general? Second, is the hypothesis supported more strongly for children who have suffered one type of maltreatment rather than another or whose maltreatment is more severe?

As previously indicated, we will investigate each hypothesis cross-sectionally and then longitudinally. The cross-sectional analyses will derive their power from comparisons of the maltreatment sample with the school and DSS samples. Comparison with the school sample will suggest whether maltreatment leads to different levels of school difficulties and delinquent involvement than experienced by the general population of children. Comparison with the DSS sample will allow us to estimate maltreatment's effect over an above the effects of adverse environments, chiefly due to poverty, that bring children to the attention of social service agencies.

In contrast, the longitudinal analyses will rely on comparisons within the maltreatment sample itself, asking what the impact of maltreatment experiences to a give point in time have on the risk of making the transition at that point in time into poorer school performance or initial delinquent involvement. Here the strength of the analysis is careful attention to the time sequencing of independent and dependent variables. We will mention one technical matter at this point. Only children at risk of the transition at a given moment can be considered. For the analysis of the transition into delinquency, we must know that the child is still a Mecklenburg County resident where our delinquent involvement data are recorded. Our way of knowing this is that the child is enrolled in the Charlotte-Mecklenburg Schools. This means that only children with school records are included in the longitudinal analysis of maltreatment impacts on delinquent involvement (Hypothesis 1), even though no school performance variables are part of this analysis. For the analyses of Hypotheses 2 and 3, which involve school performance variables, this restriction is automatic.

Table 3.1. Sample Sizes and Compositions.

Sample	**N**
Maltreatment sample	2234
Of school age (> 5 years)	1186
With school records coded	1369
Of juvenile court age (> 9 years)	1325
With school records coded	1034
School sample	338
With school records coded	331
Of juvenile court age	262
With school records coded	242
DSS sample	221
With school records coded	178
Of juvenile court age	153
With school records coded	129

Table 3.2: Gender and Race Compositions of Samples

	Gender		Race	
Sample	Percent Female	Case Base	Percent African-American	Case Base[a]
Maltreatment	52.5	2217	54.3	2177
School	47.8	387	35.2	375
DSS	57.3	220	82.7	214

[a] Excludes Native Americans, Hispanics, Asians

Table 3.3 Measures of Maltreatment, Delinquent Involvement, School Performance, and Background Variables for Cross-Sectional and Longitudinal Analyses

	CROSS-SECTIONAL ANALYSIS	LONGITUDINAL ANALYSIS
Maltreatment Variables (from Central Registry)		
Abuse reports	Total number in study period	Number up to this[a] month
Neglect reports	Total number in study period	Number up to this month
Substantiated reports	Total number in study period	Number up to this month
Age at onset		Age is days at first report
Recent reports		Number of reports during last 4 (Ch.3) / 12 (Chs.4,5) months[b]
Delinquent Complaints (from Juvenile Court card file)		
Any	1=1 or more in study period	1=first complaint was this month
Property	1=1 or more in study period	1=first complaint was property and this month
Violent	1=1 or more in study period	1=first complaint was violent and this month
Status	1=1 or more in study period	1=first complaint was status and this month
School Performance (from cummulative school records)		
California Achievement Test	mean standard score across reading and math across all test administrations	1=drop of more than .6623 in mean standard score across reading and math between continguous administrations not more than 5 years apart
Grade point average	mean across 4 subjects across all years	1=GPA went down one full point (letter grade) or more in year including this month
Dropped out	1=dropped out after reaching 16	1=dropped out during year including this month

Absences	mean number of days absence across all years	1=days absent increased by more than 8 days in year including this month
Elementary Grades Behavior Problems	proportion of possible problems indicated[c]	1=number of problems recorded increased 2 or more from last year to year including this month
Retained in grade	proportion of CMS years retained	1=retained in grade for first time during year including this month
Special program involvement	1=placed in special program	1=placed in special program in year including this month
Background Variables		
Race	0=white 1=African American Others excluded	
Gender	0=male 1=female	
Family structure (from school registration form)	3 dummy variables: blended family (2 parents, 1 biological) single parent (1 biological parent) no biological parent reference category is 2 biological parents	
Age	At end of study period (6/30/89)	In this month
Number of other children in household	Brothers, sisters, other children listed on school registration form	
Sibship density	Dummy variable: 1 = one or more other children listed on school registration form with birth year plus or minus two years	
Poverty program participation	Family ever on AFDC, Medicaid, foodstamps	Family on AFDC, Medicaid, or foodstamps before this month

[a] Month in this child-month observation

[b] We have discovered no basis in theory or previous research for establishing the proximate period in which maltreatment's effect is maximized. In these data maltreatment proximity effect on initial delinquent involvement is greatest when reports in the most recent 4 months are specified. This is our measure for Chapter 4 (maltreatment effect on delinquent involvement. Since our school data are based on annual, end of school year recordings, the 4-month proximity measure is inappropriate where school records are used. Hence, for Chapters 4 (maltreatment effect on school performance) and 5 (maltreatment effect on delinquency, net of school performance) we use 12-month proximity.

[c] Maximum possible count each year is three problems. Possible problems is three times number of years enrolled in CMS elementary grades.

CHAPTER 4
CHILD MALTREATMENT AND YOUTHFUL PROBLEM BEHAVIOR

This chapter examines the extent to which child maltreatment is associated with youthful problem behavior serious enough to come to the attention of the juvenile justice authorities. Retrospective delinquency studies, asking the question "What proportion of delinquents have been maltreated?" tend to conclude that the causal link between maltreatment and delinquency is direct and very strong. It is not uncommon for retrospective research designs to yield delinquency rates upwards of 50% (Burgess, Hartman, and McCormack 1987; Cavaiola and Schiff 1988; Sandberg 1989). Recent prospective studies, however, asking the question "What proportion of maltreated children become delinquent?" report far lower, yet statistically significant, delinquency rates of 26% and 14% (Widom 1989c; Zingraff et al. 1993). On the child maltreatment-criminality relationship, Widom concludes, "The strength of the cycle of violence may be of less magnitude than some might have expected" (1989a: 267).

Delinquency is only one of many possible social, social-psychological and behavioral consequences of maltreatment. "Child maltreatment is a legal, medical, social, and psychological problem" (Mayall and Norgard 1983: 207), implying that the behavior problems associated with maltreatment are many and varied. Cicchetti and Barnett note, "Not surprisingly, there is no specific single pattern exhibited by maltreated children that can be described as the profile of abuse and neglect" (1991: 359). Findings from clinical research and social surveys provide support for this claim. Victims of maltreatment appear to be at considerable risk of problems ranging from stomach aches, fear of being alone, problems with sleep, poor self-concept, and inadequate trust of others (Burgess, Hartman, and McCormack 1987; Kinard 1980a) to aggression towards persons and property (Hoffman-Plotkin and Twentyman 1984; Paperny and Deisher 1983; Trickett and Kuczynski 1986). A significant body of research also suggests that children are likely to blame themselves for the maltreatment (Ney, Moore, McPhee, and Trought 1986) and withdraw psychologically (Kaufman and Cicchetti 1989). Blame and withdrawal may account for suicide ideation and suicide attempts reported for maltreated children (Cavaiola and Schiff 1988; Deykin, Alpert, and McNamara 1985), as well as the reported link between maltreatment and runaway behavior (Gutierres and Reich 1981; McCormack, Janus, and Burgess 1986; Rimsza, Berg, and Locke 1988). Girls are likely to run from sexual abuse and overly restrictive family relations, and boys appear to run from rejecting and abusive family environments (Young, Godfrey, Matthews, and Adams 1983; see also, Farber and Knast 1984). Browne and Finkelhor's (1986) literature review suggests that runaways are reacting to fear and anxiety. Youthful criminal behavior may be one of the more improbable direct outcomes of maltreatment, because it is problem behavior taken to an extreme. Furthermore, if maltreatment results in low self-esteem, inadequate trust of others, weak family and

institutional ties, and self-blame, the effect of maltreatment may not be direct at all. Therefore, we feel that a more cautious examination of the maltreatment-delinquency relationship is warranted.

Steele (1986: 291) states our position well: "We do not want to give the impression that we think all the evils in the world are the direct result of the maltreatment of children, although we do believe that how we bring up our children has a most profound effect upon how our society is behaving and how we deal with each other as human beings."

Our research seeks answers to five specific questions: First, how great is the risk of delinquency among maltreated children? Second, is their rate of delinquency greater than that of two comparison samples -- nonmaltreated school and impoverished children? Third, what are the effects of maltreatment on delinquency net of age, race, gender, and family structure? Fourth, is maltreatment associated with specific types of juvenile offenses? Fifth, what aspects of the seriousness of maltreatment account for differences in the likelihood of delinquency among maltreated children?

LITERATURE REVIEW

The central hypothesis guiding research on the link between maltreatment and delinquency is that problem behavior is related to a child's earliest emotional and social development. Episodes of abuse and neglect can damage healthy emotional and social development (Aber et al. 1989; Browne and Finkelhor, 1986; Dean et al. 1986; Gold, 1986; Howes and Eldredge, 1985; Jaffe et al. 1986; Kinard, 1980b; McCormack et al. 1986; Mueller and Silverman, 1989; Trickett and Kuczynski, 1986). Further, healthy early development, all else equal, establishes a crucial foundation upon which long-term commitment to established societal norms and values can be built. Law-abiding behavior is one example of this long-term commitment. A great deal of research lends support to this view.

Many studies, especially those from the 1970s and early 1980s, suggest a simple and direct relationship between maltreatment and delinquency. They typically report that the overwhelming majority of delinquent children are abused or neglected (cf., Burgess et al. 1987; Cavaiola and Schiff 1988; Lewis et al. 1979; Lynch and Roberts 1982; Mouzakitis 1981; Sandberg 1989; Steele 1975).

As noted in Chapter 3, much of the earlier research examining the consequences of maltreatment generally, and the maltreatment-delinquency relationship specifically, was poorly designed and executed. Thorough reviews, evaluations, and critiques of this body of research (Garbarino and Plantz 1986; Widom 1989b,d) make it clear that previously reported findings must be regarded as tentative and viewed cautiously (see also Garbarino 1989; Widom 1988; and Howing et al. 1990, for particularly concise conceptual and methodological critiques of child maltreatment research).

The conceptual and methodological problems most likely to affect maltreatment-delinquency relationship findings are the use of small and unrepresentative convenience samples, not verifying self-report accounts of prior maltreatment, the failure to use comparison samples, an unquestioning overreliance on retrospective research designs, and failure to control for factors that may influence both maltreatment and delinquency. Children located in runaway shelters or confined to detention centers have been the most studied. Such children are not an adequate representation of either runaways or delinquents. There is seldom any attempt to distinguish between a child's recollection and perception of poor, inadequate, or improper parenting and episodes of abusive behavior.

Regardless of extent or magnitude, maltreated children's delinquency rate is quite uninformative unless it is compared to a rate observed for other groups of children. A representative sample of children in general is necessary to provide a baseline against which to compare the delinquency of maltreated children.

In addition, the link between poverty and officially reported maltreatment, especially neglect, should not be ignored (Pelton 1978). It is important to determine the maltreatment effects over and above the effects attributable to the family chaos associated with lower-class status and welfare dependency" (Aber et al. 1989:587; see also Aber and Cicchetti 1984). A nonmaltreated but poor comparison sample is required to establish the net effect of maltreatment over poverty.

Retrospective research designs characterize most of the maltreatment-delinquency research. Such studies illogically sample only the delinquent stratum from what should be the dichotomous dependent variable - delinquent versus nondelinquent. In such studies, delinquency, then, is actually rendered a constant. These studies may further inflate the observed delinquency rate for maltreated children if the sample is drawn, as it typically is, from detention centers or training schools which certainly house seriously delinquent children.

Finally, this body of research seldom controls for the possibility that the observed maltreatment-delinquency relationship is in fact spurious. Research suggests that many of the correlates of child maltreatment and delinquency are quite similar (for example, race, ethnicity, family and social environment, household poverty, family structure). Without controlling for these potential contaminating effects, it is difficult, if not impossible, to determine if one is examining the coterminous nature of two social problems or establishing the effects of maltreatment on delinquency.

Four recent prospective studies, each with more appropriate, albeit different research designs, serve as guides for the present analysis. Generally, these four studies report rates of delinquency for maltreated children well below the estimates reported in earlier research. Alfaro (1981) examined the case files of approximately 5,000 children from 1,423 families reported for suspected child abuse or neglect. The unit of analysis for Alfaro's study was all children in a family reported for suspected abuse or neglect, not the abused or neglected child. Therefore, not all of the children in his sample were reported for maltreatment. An

"officially" non-abused sibling of an "officially" abused child could have been, and often was, found to have a record of delinquency or ungovernability. The proportion of families with both suspected maltreatment and one or more children with delinquent offenses was approximately 42 percent. When the reportedly maltreated child was used as the unit of analysis it was discovered that approximately 21 percent had records of delinquency or ungovernability (see, Alfaro 1981:191, for a discussion of this distinction). The study lacked a control group, however. Consequently, we do not know if the reported delinquency risk was any greater than that of the general youth population.

McCord (1983), in a forty-year longitudinal study, assessed the delinquency rates of 232 males first contacted between 1939 and 1945. Subjects were assigned to categories of abused, neglected, rejected, and loved on the basis of interaction patterns with their respective parents. Abused, neglected, and rejected children had significantly higher rates of delinquency than loved children (10%, 15%, 29% versus 7%, respectively). It is interesting to note that the rate of delinquency for rejected children was three times greater than that of abused children and twice that of neglected children. While there may be some reason to be cautious about the classification scheme utilized (see Widom 1989d), especially the rejected category (those neither abused nor neglected, but unloved), these findings suggest that abused children are the least at risk of delinquency among the "non-loved." Indeed, 18% of the children in a combined category of neglected or rejected, as opposed to 10% of the abused children had records of juvenile delinquency. McCord also assessed the impact of child maltreatment on adult criminal behavior. She found that maltreatment had a greater impact on delinquency than it did on adult criminal behavior. Disregarding adult offenders who began their criminal careers as juveniles, "the loved were more likely than the rejected and almost as likely as the neglected or abused to become criminals as adults (1983:268).

Widom (1989c) used a prospective "specialized cohorts" design with a control cohort matched on sex, race, age, and approximate family socioeconomic status to assess the extent to which the risk of delinquency for maltreated children is different than that for nonmaltreated children similar on the matching criteria. Her findings can be summarized as follows: 1) maltreated children have more juvenile arrests than the non-abused control group (26% versus 17%); 2) maltreated children have more arrests for violent offenses than controls (11% versus 8%); 3) maltreated children have more serious delinquent careers than controls as measured by the mean number of offenses (2.43 versus 1.41); 4) maltreated males have higher rates of delinquency than maltreated females (33% versus 19%), but both maltreated groups are significantly more likely than their respective controls to have been arrested (for males, 33% versus 22%; for females, 19% versus 11%); and 5) maltreated African-American children have higher rates of delinquency than maltreated white children (38% versus 21%), but both maltreated groups have higher rates than their respective controls (for African-Americans, 38% versus 19%; for whites, 21% versus 15%). Widom reported the same general patterns for adult arrests. Maltreated children had an adult arrest rate of 29% while controls had a rate of 21 percent.

In an earlier analysis of the data for the present study, Zingraff et al. (1993) compared the extent of delinquent involvement of physically abused, sexually abused, and neglected children with that of nonmaltreated school and nonmaltreated poor children. This relationship was examined for complaints against juveniles: first, for any offense and, then, separately for property, violent, and status offenses. Multivariate analyses statistically controlled for age, gender, race, and family structure. Maltreated children as a whole had a delinquency rate of 14 percent as compared to a nine percent rate for nonmaltreated impoverished children and five percent for nonmaltreated school children. The multivariate maltreatment-school comparison of delinquent complaints in general showed that the overall experience of maltreatment, but not the specific type or frequency of maltreatment, places children at a statistically significant elevated risk. This elevated risk, however, was essentially due to the increased involvement of maltreated children in status offending. Maltreatment did not present significant special risks for property or violent offenses for that comparison. Impoverished children, like school children, were at less risk of status offense complaints than maltreated children, but no statistically significant differences were found for overall, property, and violent complaints.

On balance these four studies suggest that child maltreatment is an important correlate of delinquency. It is important to recognize that the proportions of maltreated children found delinquent are substantially smaller than those reported in earlier studies characterized by the methodological problems noted above. We suspect that the reportedly strong maltreatment-delinquency relationship may be revealed as a somewhat weaker, though still significant relationship as research becomes even more methodologically rigorous.

ANALYSIS PLAN

In the first part of the analysis we present the maltreatment characteristics and the delinquency involvement for each of our three samples (maltreatment, DSS, school) and present the descriptive comparisons for all variables used in the study. We follow the univariate analysis with multivariate analyses of delinquent involvement using logistic regression and event-history analysis. The logistic regression allows one to estimate the association of neglect, abuse, and the overall maltreatment experience on delinquency while controlling for race, gender, age, and family structure. The event history analysis attaches specific time referents to each variable and examines the maltreatment-delinquency relationship longitudinally. What distinguishes the event-history model from conventional logistic regression models is that it allows one to estimate not only the probability of an event, but also its timing and place in the sequence (Land, McCall, and Parker 1994). We gain clarity about causal processes but lose the comparisons of maltreated children with the school and DSS samples.

Maltreatment Characteristics Across Samples

The data presented in Table 4.1 indicate that slightly over two-thirds of the maltreatment sample is comprised of neglected children (67%). Forty-four percent have reports of physical or sexual abuse. Forty-seven percent of the children in the maltreatment sample have substantiated reports. As would be expected, our random sample of the general juvenile school population includes some children with maltreatment reports. Approximately three percent of the school comparison sample children have reports for abuse and another three percent for neglect. Three percent have substantiated reports. Maltreated children have been removed from the DSS sample in order to better assess the independent effects of maltreatment on delinquency over and above that which might result from a generally adverse social, economic, and home environment.

// Table 4.1 about here //

Delinquent Involvement Across Samples

The overall delinquency rate for children in the maltreatment sample is 11 percent. Maltreated children are twice as likely to come to the attention of juvenile authorities for property and status complaints (5% and 6%, respectively) than for violent complaints (3%). These simple findings are quite significant in their own right. They lend support to our earlier observation that the extremely high rates of delinquency reported in the vast majority of previous research are the likely the result of retrospective research designs that sample from unrepresentative samples of seriously delinquent children. While we do not suggest that a delinquency rate of 11 percent is insignificant, it is nowhere near the 50% typically presented in both the scholarly and public discourse on this topic. In addition, these simple descriptive findings suggest that the cycle of violence hypothesis held by so many is of questionable utility: complaints of status and property offending far surpass complaints of violent offending in the maltreatment sample.

In comparison to maltreated children, the general school sample is at significantly less risk of offending overall and at less risk for each type of delinquency examined. The general school sample has a rate of delinquency below 6 percent. The highest rate of complaints for this sample is found for property offenses. It is interesting that the school comparison sample is more likely to have complaints alleging property offenses than what might be considered the least serious form of delinquent offending, status offending.

The delinquency involvement rates for disadvantaged children in the DSS sample are significantly lower than those of the maltreated children for overall complaints and for property and status offense complaints. The overall rate of complaints is 7%. Property offense complaints are the most likely (approximately 4%). The complaint rate for violent offenses is not significantly different from that of the maltreatment sample.

Although the observed differences in complaint rates between the maltreatment sample and the two comparison samples are important, it is necessary to determine if they remain statistically significant once we have taken into account potentially confounding factors. We will make this determination by controlling for race, gender, age, family structure, and poverty program participation for each comparison. This will establish the net effect of the maltreatment experience.

Background Characteristics Across Samples

The mean age for the maltreatment sample is approximately 15 years. Forty-six percent are male and 47 percent white. A maltreated population that is minority white in a county that is 69 percent white (North Carolina State Data Center, 1984) is not surprising but still noteworthy. Maltreated children are more likely to reside in a single parent household (42.4%) than in any other household type. Only twenty-nine percent reside with both biological parents and slightly less than ten percent (9.5%) reside in a two parent household reconstituted by marriage. A sizeable proportion of maltreated children (19.2%) do not have the benefit of even a single biological parent in the household. Thirty-two percent have had some participation in poverty programs during the study period.

School comparison sample children are predominately white (68%) and evenly split by gender (51% male). The mean age for the school comparison sample is 14.8 years. Approximately sixty-four percent live with two parents, thirty percent reside with a single parent, and only six percent are found in the other family configurations. These proportions closely resemble those for the state. Sixty-nine percent of children in North Carolina live in two-parent households, 21 percent in single-parent households, and 11 percent in other family configurations (Bureau of Census 1990). Eleven percent of the school comparison sample have participated in a poverty program at some time.

The poverty comparison sample is slightly younger than the maltreatment and school samples (mean age = 14.3 years). African-Americans and females constitute the majority of the children in the DSS comparison sample. Eighty percent are African-American and fifty-seven percent are female. To the extent that the DSS sample represents officially recognized economic and social hardship, it is noteworthy that this sample is imbalanced by gender and especially by race. Sixty percent of the children in the DSS comparison sample live with a single parent, and only twenty three percent reside in two-parent households (biologically intact and those reconstituted by marriage). Seventeen percent reside with neither biological parent. As would be expected, the overwhelming majority of the DSS comparison sample had received economic assistance at the time the data were collected (84%).

MULTIVARIATE ANALYSES

The logistic regression analyses estimating the risk of delinquency for maltreated children are presented in Tables 4.2 through 4.4. Table 4.2 examines the risk of overall delinquency offending. Both the maltreatment-school and maltreatment-DSS comparisons are presented. Table 4.3 determines the extent to which maltreatment is related to specific types of delinquency for the maltreatment-school comparison, and Table 4.4 presents the maltreatment-DSS comparison for the risk of specific types of delinquency. We will have found support for the assertion that maltreatment increases the likelihood of delinquency if the findings in this part of the analysis indicate significant net differences between maltreated children and their school and disadvantaged counterparts after controls for race, gender, age, family structure, and poverty program participation.

Table 4.5 presents the longitudinal portion of our analysis. In the event history analysis we examine several events in the lives of maltreated children in the sequence in which they occurred. We examine 1) the onset of maltreatment, 2) abuse and neglect reports, 3) substantiated reports, and 4) the proximity of maltreatment episodes.

CROSS-SECTIONAL LOGISTIC REGRESSION

It is necessary to present two equations in this portion of the analysis because of high collinearity among the maltreatment variables most important to the examination of maltreatment effects. If number of abuse reports, number of neglect reports, and number of substantiated reports are entered in a single equation the independent effects of each are hidden. In order to preserve distinctions among the maltreatment variables we have chosen to examine the effects of type and number of maltreatment reports and the number of substantiated maltreatment reports separately. While a single equation including all three maltreatment variables distorts the independent effects of each, we can determine the overall effect of the maltreatment best experience by examining the model with all three variables.

//Table 4.2 about here//

Maltreatment-School Comparison for Overall Delinquency

Equation 1 in Table 4.2 shows that maltreated children are significantly more likely than school children to have delinquent complaints. This is indicated by the statistically significant log-odds parameter estimates for both abuse reports (.407) and neglect reports (.336), as well as the improvement of the fit of the model over that which is obtained with the background variables alone (difference in -2 log likelihood = 8.535). Most important here is that these are partial effects, net of the effects of race, gender, age, family structure, and poverty program participation. While delinquency is more likely as well for males, older children, children living with no biological parent, and children living in poverty, none of

these variables individually or in concert reduce the maltreatment-delinquency relationship to a statistically insignificant level.

The major focus of Equation 2 in this comparison is the relationship between the number of substantiated reports and delinquency, controlling for background factors. The findings mirror those of Equation 1, again showing the expected effects of gender, race, age, family structure, and impoverishment. In addition, children with substantiated maltreatment reports are at a statistically elevated risk of delinquency net of these important background variables. This single maltreatment variable improves the statistical fit of the model over and beyond that yielded by the background variables.

As noted previously, the independent contributions of the three measures of maltreatment used in this study can not be examined in a single equation because of the covariation among them. We can, however, ascertain the overall impact of the three maltreatment variables on delinquency net of the contribution of background variables. The statistically significant difference in -2 log likelihood scores of 12.008 indicates that the inclusion of all three maltreatment variables enhances the fit of the total model over what it would have been with the maltreatment variables excluded.

On balance, while certain background variables exert an influence on the risk of delinquency, maltreated children (identified by type of maltreatment and the number of substantiated reports) are at a net significantly elevated risk of delinquency in comparison with the general school population.

Maltreatment-DSS Comparison for Overall Delinquency

The purpose of this comparison is to distinguish the risk of delinquency for maltreated children from the risk associated with a generally adverse home environment. Equation 1 for this comparison suggests children with abuse reports are at greater risk of delinquency than their nonmaltreated counterparts. Neglect reports, however, do not result in such a distinction. This may be the result of neglect reports being intertwined with economic dependency issues. Indeed, poverty program participation in this comparison does not predict delinquency either. Overall, this equation indicates that males, older children, children living without a biological parent, and reportedly abused children are at greater risk of delinquency that their DSS sample counterparts. It is important to note, however, that the maltreatment type variables taken together do not significantly increase the adequacy of the fit for the model over that obtained with background variables alone. In other words, maltreated children's risk for overall delinquency is indistinguishable from that of the nonmaltreated, but potentially at risk, DSS sample.

Equation 2 examines the effect of substantiated maltreatment reports. Such children, in addition to males, older children, and children living without a biological parent in the household, are at an elevated risk of delinquency. In addition, this maltreatment variable does

improve the fit of the model over the fit obtained for background variables alone. When all three maltreatment variables are entered into the same model, however, the improvement in model fit is insignificant because the improvement is not great enough to overcome the loss of degrees of freedom. Taken together, all available maltreatment information does not significantly distinguish maltreated from DSS sample children's risk of delinquency.

THE EFFECT OF MALTREATMENT FOR SPECIFIC OFFENSE TYPES

The findings in Table 4.2 indicate that maltreatment is an important source of risk for juvenile offending. This is clearest for the maltreatment-school comparison. Significant maltreatment effects were observed for each of the three models discussed (type of maltreatment report, number of substantiated maltreatment reports, type of maltreatment and substantiated reports together). While maltreatment exhibited no significant net effect in two of the three equations in the maltreatment-DSS comparison, the number of substantiated reports did increase the risk of juvenile offending.

Tables 4.3 and 4.4 seek to determine if maltreatment poses a special risk for specific types of juvenile offending. We examine violent, property, and status offenses separately. Table 4.3 portrays the maltreatment-school comparison; Table 4.4 the maltreatment-DSS comparison.

// Table 4.3 and 4.4 about here //

Table 4.3 shows that higher numbers of neither abuse nor neglect reports put children at elevated risk for violent, property, or status offending in comparison with the general school population. This is seen in both the insignificant regression coefficients and the insignificant contribution these variables make to the overall fit for the model. On the other hand, children with substantiated maltreatment reports are at elevated risks of each type of delinquency. African-Americans, males, and older children are at increased risk of violent and property offending as well. Poverty program participation is not related to violent or property offending. Single parent households seem to place children at risk of property offending. Substantiated maltreatment reports, poverty, age, and family structure are significant correlates of status offending. Children in blended and no biological parent family configurations are particularly at risk of status offending.

The maltreatment-DSS comparison essentially mirrors the maltreatment effects reported in Table 4.3. Substantiation plays a crucial role, while maltreatment type does not. Although the substantiation variable does not increase the fit for the full model when examining property offending, substantiation does significantly add to the explanatory power of the model for violent and status offending.

In sum, maltreatment places children at risk of delinquency in both the school and DSS comparisons net of race, age, gender, family structure, and poverty.

EVENT HISTORY ANALYSIS

The cross-sectional analysis thus far presented has two distinct disadvantages for examining the maltreatment-delinquency relationship. The causal logic for such an analysis assumes that the maltreatment experience occurs prior to the onset of delinquency. This, however, is not necessarily the case. Delinquency can also occur either prior to or at the same time as the reported maltreated. Cross-sectional analyses can determine statistical associations but are unable to substantiate conclusively the required time-order. In such cases we may incorrectly be ascribing a causal effect to maltreatment. Furthermore, certain maltreatment information can not be utilized in cross-sectional analyses because it is conceptually meaningless for nonmaltreated children in the comparison groups. For example, the age at which maltreatment was first experienced can not be used in cross-sectional analyses.

The event history analysis presented here in Table 4.5 focuses only on maltreated children, ensures that the maltreatment episode precedes the delinquency event, and allows for a more complete use of available maltreatment information. We again examine maltreatment's impact for different types of offending - any delinquency, property offending, and status offending. Violent offending is excluded from the analysis because so few maltreated children had such offenses following maltreatment that the coefficients were unstable. This in and of itself should cast further doubt on the generally accepted "cycle of violence" hypothesis.

// Table 4.5 about here //

The data presented in Table 4.5 indicate that the model fit for each of the offense types examined is enhanced with the addition of the maltreatment variables, net of the background variables controlled. This finding is demonstrated by the significant difference in the -2 log likelihood scores for each offense type. In addition, at least one maltreatment variable is a significant predictor of offending net of other background variables in each equation. There are some differences across offense types with respect to which specific maltreatment characteristics significantly predict each offense type.

For any offense during the risk period, however, the older the child at the time of first maltreatment report, the greater the risk of a delinquency complaint by the end of the study period. In addition, at any time during the risk period, the higher the number of abuse reports up to that time, the greater the chance of delinquency. The other maltreatment characteristics examined here do not independently affect the risk for delinquency. The general measure of delinquency, then, is not significantly influenced by the proximity of maltreatment, a higher number of substantiated reports, or a higher number of neglect reports.

That substantiation does not play a significant role here is most interesting given that recent statements by leading researchers have reaffirmed the standard practice of regarding substantiated cases of maltreatment as more serious than unsubstantiated reports (Widom,

1989c; but also see Leiter, Myers, and Zingraff 1994). Furthermore, the cross-sectional analyses presented earlier in this chapter indicated that substantiation was a significant correlate across all offense types and for both the maltreatment-school and the maltreatment-DSS comparisons. This suggests that substantiation distinguishes maltreated children from others but that it may not be as important in distinguishing among children reported for maltreatment.

The significant contribution of the number of abuse reports to the risk of delinquency for any offense found here closely follows the findings reported for the cross-sectional analysis in Table 4.2 with respect to the maltreatment-DSS sample comparison. In that comparison of two generally "at-risk" samples, the number of abuse reports, but not the number of neglect reports was a significant correlate of delinquency for any offense. Both abuse and neglect were significant correlates of delinquency for any offense in the maltreatment-school sample comparison, however. Apparently, for children living in generally adverse environments resulting from either the difficulties brought about by poverty or those brought about by maltreatment, abuse poses a special and added risk for delinquency.

Our finding that the older the child at the first maltreatment report, the greater the risk of delinquency may seem implausible at first glance. Maltreatment research has speculated that the earlier the first episode of maltreatment, the greater the likelihood of persistent consequences for at least two reasons. First, it is believed that the earliest life experiences heavily impact a child's social and emotional development. Indeed, some theorists (Gottfredson and Hirschi 1990) argue that such development is established by no later than age eight. Thus, the earlier the age at which maltreated, the greater the likelihood of developmental disruption and distortion. Second, maltreatment is not expected to be a single episode, but instead a pattern that persists throughout the formative years. Children exposed to maltreatment early in life can be expected to accumulate a greater number of maltreatment episodes. A greater exposure to maltreatment should lead to more serious problems in later life.

While both positions may be accurate for some consequences of maltreatment, they may not be as useful in explaining delinquency. Delinquency is as much a legal construction as it is an indication of youthful behavioral problems or a consequence of maltreatment. In general, only older children are eligible for the designation of "delinquent." We do not suggest that maltreated children exhibit no behavioral problems in their earlier years or that earlier behavioral problems are not predictors of later and more serious conduct norm violations. Indeed, the findings reported in the next chapter clearly suggest otherwise. We do suggest that while early maltreatment may well affect a child's emotional and social development and that such development may result in mistrust of others, fear, anxiety, and aggression, delinquency as a form of behavior is not an available reaction to maltreatment in early childhood. The serious, public, and observable behavior that is most likely to result in a delinquency complaint is typically reserved for older adolescents.

The serious acting out behavior of older maltreated children (whether running away from home or displacing their aggression toward others or toward property) may well result from their attempt to escape, avoid, or terminate the maltreatment they have experienced (Agnew 1992). In turn, such behavior for older adolescents is most likely to come to the attention of juvenile justice authorities. Consequently, delinquency is an available reaction to maltreatment for older adolescents, and older victims of maltreatment are most likely to be defined as an offender.

Maltreatment affects property offending in much the same way as it does offending in general. Older age at first reported maltreatment and higher accumulated numbers of abuse reports also significantly raise the likelihood of property offending net of background and other maltreatment variables. Accumulated neglect reports, as well, increase the risk of property offending. Neglect as measured here may indicate a denial of access to economic necessities by legitimate means, the failure of parents to instill in their children the proper conduct norms and respect for the property of others, the simple lack of parental supervision, or some combination of these. Our measure of neglect does not allow us to differentiate among these possibilities. Overall, the likelihood of property offending is significantly increased by age at first reported maltreatment and the accumulated weight of abuse and neglect reports.

In contrast to overall and property offending, neither age at first maltreatment report nor the accumulated weight of abuse and neglect reports impact the likelihood of status offending. Only the number of substantiated maltreatment reports independently affects the likelihood of a first status offense. Running away from home is the predominant behavior that makes up this offense type. Running away is an obvious example of a child trying to escape one's adverse environment (Agnew 1992). Our finding here suggests that substantiated reports for any type of maltreatment are likely to help push the child out of the home.

SUMMARY

This chapter has examined the maltreatment-delinquency relationship in some detail. We compared maltreated children's risk of delinquency involvement for overall offenses, violent offenses, property offenses, and status offenses to that of two comparison samples in cross-sectional analyses. We also examined the relationship by way of a time-sensitive event history analysis.

Although there are some differences across these analyses with respect to which aspects of maltreatment are the most important in predicting different delinquency outcome measures, the overall conclusion to be drawn thus far is that maltreatment makes a difference, although not as strong a one as has sometimes been supposed. Maltreated children are at significantly elevated risk of delinquency relative to the school and DSS comparison samples in the cross-sectional analysis. Furthermore, the event history analysis confirms, with its

causal inference advantage, that the maltreatment experience increases the likelihood that the child will have some contact with the juvenile court. The cross-sectional analyses are suggestive of a causal interpretation of the observed relationship between maltreatment and delinquency. The event history analysis supports such a causal interpretation.

In the following chapter, we turn attention to the impact of maltreatment on both cognitive and behavioral aspects of school performance.

Table 4.1 Descriptive Statistics by Sample (number of cases on which statistic is based in parentheses).

	Maltreatment Sample	School Sample	DSS Sample
Delinquent Complaints (1 or more)			
Any offense	.113 (1435)	.055 (292)*	.072 (167)*
Violent offense	.026 (1435)	.007 (292)*	.018 (167)
Property offense	.054 (1435)	.031 (292)*	.036 (167)*
Status offense	.059 (1435)	.021 (292)*	.018 (167)*
Maltreatment Characteristics (1 or more)			
Abuse reports	.438 (1435)	.027 (292)*	
Neglect reports	.672 (1435)	.028 (292)*	
Substantiated reports	.470 (1435)	.034 (292)*	
Background Characteristics			
Race (1=African American)	.529 (1413)	.323 (282)*	.807 (161)*
Gender (1=female)	.534 (1433)	.491 (291)*	.566 (166)
Age in years (1989)	14.570 (1435)	14.790 (291)	13.343 (166)
Family structure			
two biological parents	.289 (1042)	.573 (253)*	.206 (136)*
blended	.095 (1042)	.071 (253)*	.029 (136)*
single parent	.424 (1042)	.296 (253)*	.596 (136)*
no biological parent	.192 (1042)	.059 (253)*	.169 (136)
Poverty program participant	.323 (1435)	.113 (292)*	.838 (167)*

*Statistically different from maltreatment sample at the p=.05 level (1 tailed for school sample, 2 tailed for DSS)

Table 4.2 Logistic Regressions of Delinquent Complaints for Any Offense on Maltreatment and Background Variables.

	Maltreatment and School Samples		Maltreatment and DSS Samples	
	1	2	3	4
Maltreatment Characteristics				
Number abuse reports	.407*		.281*	
Number neglect reports	.336*		.214	
Number substantiated reports		.374*		.320*
Background Characteristics				
Race (1=African American)	.081	.038	-.011	-.046
Gender (1-female)	-.627*	-.623*	-.876*	-.888*
Age in years (1989)	.115*	.115*	.125*	.127*
Family structure				
blended	.399	.466	.067	.098
single parent	-.188	-.129	-.412	-.394
no biological parent	.804*	.843*	.566*	.544*
Poverty program participant	.367*	.398*	.290	.275
Intercept	-4.296*	-4.129*	-3.862*	-3.773*
Model Fit (-2 log likelihood)				
Background variables only[a]	782.181*		758.751*	
This equation[a]	773.646*	774.282*	755.269*	752.951*
Improvements of this equation over background variables only	8.535*	7.899*	3.482	5.8*
Improvement of background and all maltreatment variables over background variables only	12.008*		7.01	
Number of cases	1232		1136	

* Statistically significant at the p=.05 level(1-tailed)

[a] Statistical significance is for improvement in fit from covariates over intercept alone.

Table 4.3 Logistic Regressions of Delinquent Complaints for Violent, Property, and Status Offense on Maltreatment and Background Variables, Maltreatment and School Samples (N = 1232)

	Violent Offenses		Property Offenses		Status Offenses	
	1	2	3	4	5	6
Maltreatment Characteristics						
Number abuse reports	.306		.310		.175	
Number neglect reports	.420		.275		.259	
Number substantiated reports		.765*		.365*		.524*
Background Characteristics						
Race (1=African American)	.919*	.853*	.585*	.550*	-.166	-.170
Gender (1=female)	-2.032*	-2.110*	-1.518*	-1.522*	.300	.276
Age in years (1989)	.140*	.151*	.114*	.113*	.129*	.130*
Family Structure						
blended	-.570	-.605	-.136	-.103	1.038*	1.061*
single parent	-.325	-.213	-.641*	-.597*	.183	.246
no biological parent	.311	.230	.281	.284	1.455*	1.396*
Poverty program participant	.356	.290	.213	.218	.681*	.661*
Intercept	-6.327*	-6.526*	-4.534*	-4.423*	-6.052*	-6.137*
Model Fit (-2 log likelihood)						
Background variables only[a]	227.152*		474.387*		458.323*	
This equation[a]	225.414*	218.714*	471.693*	470.319*	456.699*	449.192*
Improvement of this equation over background variables only	1.738	8.438*	2.694	4.068*	1.624	9.131*
Improvement of background and all maltreatment variables over background variables only	8.95*		4.927*		9.2*	

* Statistically significant at the p=.05 level (1-tailed)

[a] Statistical significance is for improvement in fit from covariates over intercept alone.

Table 4.4 Logistic Regressions of Delinquent Complaints for Violent, Property, and Status Offense on Maltreatment and Background Variables, Maltreatment and DSS Samples (N = 1136)

	Violent Offenses		Property Offenses		Status Offenses	
	1	2	3	4	5	6
Maltreatment Characteristics						
Number abuse reports	.052		.143		.160	
Number neglect reports	.043		.103		.291	
Number substantiated reports		.600*		.300*		.548*
Background Characteristics						
Race (1=African American)	.625	.637	.441	.424	-.227	-.246
Gender (1=female)	-2.186*	-2.259*	-1.808*	-1.828*	.112	.088
Age in years (1989)	.141*	.153*	.127*	.130*	.153*	.155*
Family Structure						
blended	-.711	-.792	-.906	-.915	.897*	.937*
single parent	-.492	-.419	-.890*	-.880*	.173	-.0913
no biological parent	.485	.334	.032	-.025	1.102*	1.055*
Poverty program participant	.115*	.096	.109	.098	.638*	.639*
Intercept	-5.416*	-5.953*	-4.047*	-4.098*	-6.030*	-6.146*
Model Fit (-2 log likelihood)						
Background variables only[a]	232.689*		450.428*		445.759*	
This equation[a]	232.633*	227.083*	450.020*	447.720*	443.810*	435.671*
Improvement of this equation over background variables only	.056	5.606*	.408	2.708	1.949	10.088*
Improvement of background and all maltreatment variables over background variables only	6.902*		2.757		10.268*	

* Statistically significant at the p=.05 level (1-tailed)

[a] Statistical significance is for improvement in fit from covariates over intercept alone.

Table 4.5 *Effects*[a] of Maltreatment and Background Variables on the Log Odds for Four Types of Complaints, Maltreatment Sample Only.

	Any Offense	Property Offense	Status Offense
Background Variables			
Race (1=African American)	.034	.454	-.278
Gender (1=female)	-.383*	-1.346*	.720*
Age less than 11 years old	-1.444*	-2.198*	-1.955*
Age 15 or more years old	.132	-.717*	.434
Blended family	.311	-1.329	1.123*
Single parent family	-.241	-.850*	.119
No biological parent in family	.495*	-.247	1.255*
Participated in poverty program before this month	.782*	.133	.630
Maltreatment Variables			
Age at first reported maltreatment incident (x 10^6)	2.275*	3.159*	-310.71
Number of reported maltreatment incidents during last 4 months	.452	.596	.391
Number of substantiated maltreatment reports before this month	.227	.121	.402*
Number of reports of abuse before this month	.396*	.629*	.161
Number of reports of neglect before this month	.157	.533*	-.200
Intercept	-11.405*	-11.879*	-11.652*
Model fit (-2 log likelihood)[b]	1472.405	502.116	762.424
Improvement in model fit over background variables only	13.571*	12.052*	9.416*
Number of child-months	52818	54658	54265

* Significant at the p=.05 level, one-tailed.
[a] Run with Proc Lifereg under SAS 6.08 for Windows.
[b] No significance level available here.

CHAPTER 5
CHILD MALTREATMENT AND SCHOOL PERFORMANCE
(with Matthew C. Johnsen)

Concerns for the consequences of maltreatment currently center on a "cycle of violence" by which abused children are hypothesized to be more likely to become abusive parents and spouses or even violent criminals (Herzberger 1990). Researchers have attended less to effects of maltreatment on schooling. Findings in empirical studies on consequences of maltreatment for schooling are inconsistent and generally based on inadequate data. Using a wide range of school performance measures collected across the child's entire school life, this chapter evaluates the possibility that maltreatment leads to unusually poor school performance. It pays special attention to comparison of maltreated children with other children raised in disadvantaged circumstances.

METHODOLOGICAL PROBLEMS IN EXISTING STUDIES

A study of effects of abuse and neglect on school performance would not appear to present great obstacles to straightforward investigation. It requires individual-level data on family and school histories of a representative sample of maltreated children and comparison samples to isolate maltreatment effects. Such data, however, have been hard enough to obtain that such studies have been rare and usually methodologically flawed: few use representative samples of sufficient size for multivariate analysis, compare maltreated children to other children, and are based on prospective, longitudinal designs, extending school histories to the crucial adolescent years. Because of the relative infrequency of maltreatment, subjects tend to be identified through hospitals, child protective or social welfare registries, special education classes, specialized settings for persons with disabilities, or juvenile courts, rather than through a random selection process. Each sample source has its own characteristics that may lead to sampling biases and problems which hinder interpretation and generalization (Calam and Franchi 1987, p. 18). Furthermore, studies often lack adequate control or comparison groups (e.g., Martinez-Roig et al. 1983). This limits conclusions about effects of abuse to mere impressions. Even when controls are present, the control group may include abused children (Lamphear 1986). Few studies try to assess the impact of child maltreatment on school performance longitudinally, although causal inferences imply a process over time. Finally, typical studies feature small samples. Often conclusions are based on samples of fewer than 100 maltreated children, in one case only 13 (Gregory and Beveridge 1984).

Many studies employ a retrospective approach. Here, maltreatment history of children having problems in school is reconstructed (Frisch and Rhoads 1982; Martinez-Roig et al. 1983; Wilkinson and Doraruma 1979). That children having trouble in school frequently are found to have been maltreated does not, however, demonstrate that abuse or neglect caused

the trouble. Causal logic requires comparison of the extent of problems in school between maltreated and nonmaltreated children. Retrospective studies argue backwards, not toward variable school outcomes, but from a constant (i.e., troubled school outcomes).

RESEARCH TO DATE AND ITS IMPLICATIONS FOR FURTHER STUDY

Inconclusive Empirical Findings

One might presume that abuse and neglect adversely impact school performance by virtue of problems engendered in attendance, concentration, hunger, fatigue, self-esteem, aspirations, social isolation and stigmatization, fear and distrust of adults, heightened rebelliousness, and central nervous system functioning. Past research, however, does not lead decisively to this conclusion. The research literature is scanty in comparison, for example, to the voluminous literature on the effect of maltreatment on risk of delinquency (see reviews by Lewis, Mallouh, and Webb 1989; Widom 1989b,d).

Most studies of maltreatment effects on academic ability and achievement find adverse impacts (Brassard and Gelardo 1987; Christiansen 1980; Eckenrode et al. 1993; Gil 1970; Kline and Christiansen 1975; Kurtz et al. 1993; McNeill and Brassard 1984; Oates and Peacock 1984; Tong et al. 1987). Enough studies, however, fail to find such differences that association of academic deficits with maltreatment cannot be regarded as established (Calam and Franchi 1987; Elmer 1977; Gregory and Beveridge 1984, but see the methodological criticism in Toro 1982).

Several studies link maltreatment to developmental difficulty and associated special education placements (Christiansen 1980; Frisch and Rhoads 1982; Gil 1970; Wilkinson and Doraruma 1979). Again, however, other studies do not uncover these links (Coon, Beck, and Coon 1980). Similarly, while some studies display a relationship between maltreatment and adjustment to school, for example absenteeism (Wald, Carlsmith, and Lederman 1988) and deportment (Calam and Franchi 1987; Eckenrode et al. 1993), this finding is not universal (Coon, Beck, and Coon 1980).

Theoretical and Empirical Distinctions by Type of Maltreatment

Beyond unresolved questions about general impacts of maltreatment, different types of maltreatment may lead to significantly different outcomes; maltreatment is not a unitary phenomena. Child maltreatment involves different actions on the part of persons maltreating the child, elicits different internal operations or coping mechanisms on the part of the child, and leads to different consequences dependent on the circumstances of the maltreatment. Hypothesized differences in effects of abuse, both physical and sexual, and neglect, the types of maltreatment most commonly recorded, follow from these distinctions.

Social learning theories appear well-suited to explaining some school performance consequences for children who have experienced physical abuse. Social learning theories generally involve three components: individuals learn certain behavior patterns from earlier experience with these behaviors; specific social conditions encourage use of previously learned behavior; and individuals engage in specific behaviors because of contingencies that these behaviors produce (Iverson and Segal, 1990). Violent households indirectly teach children lessons about violent behavior that it is all right to hit members of your family and that violence is permissible when other strategies do not work (Strauss et al. 1980). In this way violent behavior may be passed from generation to generation in a much debated "cycle of violence" (Widom 1989b). However, more immediate repercussions of these lessons are found in classrooms where displays of learned violent behavior are relabeled as "problem behavior" and then treated as such. Further, if problem behaviors disrupt normal learning processes, they also may weaken academic achievement, lowering grades and test performance. Thus, within a social learning framework, physical abuse is hypothesized to lead children to display more behavior problems, and this problem behavior also may affect academic achievement. Violence against the child that is severe enough to cause permanent damage, especially trauma to the head, may also lead directly to cognitive impairment.

Developmental theories suggest different school performance consequences for individuals who experience neglect. While physical abuse is hypothesized to lead to specific learned behaviors, neglect may cause learning deficits. Most parents are interested in their child's cognitive development during the crucial years before and during formal education. This interest manifests itself in reading to the child, providing stimulating environments and activities, supervising homework, and modeling skills and behaviors that children later mimic, such as work roles and reading. During this developmental phase, children also learn to communicate. Learning opportunities lost at one age retard or limit later cognitive development. In a developmental framework, the effect of neglect is hypothesized to be greatest on measures of achievement, including standardized achievement test scores and grades. The consequences of early neglect may be most readily seen in poor language skills, and consequently, poor performance in reading and language achievement tests. Among young children, Allen and Oliver (1982) find neglect, but not physical abuse, associated with language delay. Similarly, Martin and Rodeheffer (1976) suggest that neglect is more crucial than physical abuse in explaining intellectual handicap. Unlike children who have experienced physical abuse, violent behavior problems should not be as problematic for neglected children, though Egeland, Sroufe, and Erickson (1983) suggest that children with psychologically unavailable mothers may have interactional problems.

Sexual abuse has still other hypothesized consequences. The most promising conceptual model to trace the repercussions of child sexual abuse is Finkelhor's traumagenic approach (Finkelhor, 1987; Finkelhor and Browne 1985, 1986), which focusses on the convergence of traumatic sexualization, stigmatization, betrayal, and powerlessness. Effects of such traumatization of special relevance to school outcomes include: low self-esteem, diminished self-efficacy, problems in managing anger, and mistrust of adults.

Sgroi, Blick and Porter (1982) identify engagement, sexual interaction, secrecy, disclosure, and suppression as stages in sexual abuse. The secrecy stage--crucial because it allows the perpetrator to avoid accountability and perpetuate the abuse--may involve threats to the child and, thereby, affect school performance and involvement. The child may flee the home and drop out of school in the process. Alternatively, flight from the home may take a psychological form through immersion in school as a safe haven. In the latter response, school performance would not be adversely affected. Beyond possible negative and positive effects of flight in the face of threats, the sexual abuse process, particularly perpetrator efforts to undermine the child's credibility, may lead the child to the generalization that adults are not trustworthy. This in itself could alienate the child from institutions, such as schools, that are led by adults. When the mistrust is focused on adults with authority, the relationship between the child and his or her teachers can be threatened.

Sexual abuse's consequences in school are, therefore, predicted to be distinct from those of physical abuse and neglect. Unlike neglect, widespread cognitive deficits are not predicted from sexual abuse (see also Lusk 1993). And unlike physical abuse, while social learning may occur, in this situation the learning is not about the effectiveness of violence in general, but rather, the appropriateness of adult-child sexuality. Instead, if sexual abuse has an effect on school outcomes at all, it is most likely to lie in the child's unsuccessful integration into the institution, raising drop out and absenteeism rates and increasing difficulties relating to teachers as adults in authority. It is possible, however, that adults at school may represent reassurance in contrast to the threatening adult(s) the sexually abused child finds at home.[1]

Differences in school outcomes by maltreatment type may reflect not only real differences in the maltreatment experience, but also artifactual differences in the seriousness of maltreatment or extensiveness of evidence necessary before a report will be made to child protective services (Ards and Harrell 1993; Fryer 1990). While the whisper of sexual abuse may be enough to generate notice, and while even a single serious act of physical abuse may be sufficient, the report of neglect may require an accretion of acts that represent a long pattern of neglect. If this is true, then the predicted pattern of effects corresponds inversely to the likelihood of reporting: the less likely a maltreatment event is to be reported, the more serious it must be to be reported, hence, the more likely it is to have an effect on school outcomes.[2]

Background Variables

So far, we have reviewed literature on undifferentiated effects of maltreatment, maltreatment type, and a possible interaction effect of maltreatment and gender. In addition, research on the relationship of school performance with maltreatment requires controls to isolate maltreatment effects from other factors correlated with both maltreatment and school outcomes. Among these factors, poverty has received the most attention. Low socio-economic status has long been recognized as a determinant of poor school performance (Coleman et al. 1966; Jencks et al. 1972), although the mechanisms that produce this effect

are not understood (Harbison and Hanushek 1992). Elmer (1977) argues that socioeconomic status and related social stresses more importantly determine the course of child development than does maltreatment. Cicchetti, Aber, and their colleagues maintain that maltreatment and poverty are so closely intertwined that analytic precautions must be taken to avoid confounding effects of one with the other (Aber et al. 1989; Aber and Allen 1987; see also Zuravin's 1989 ecological account of maltreatment in poor neighborhoods). This is particularly important for neglect, because insufficient financial resources may lead directly to such key aspects of neglect as failing to provide adequate housing, nutrition, and supervision or necessary medical care. In comparison with the percentage of maltreated children in the general population who are poor, children whose maltreatment is reported to child protective services, and hence recorded in central registries, may be disproportionately poor (Gelles 1975; Newberger et al. 1977). As such, whenever possible, maltreatment effects on school outcomes should be estimated only after taking account of poverty status effects.

Beyond family economic status, other family characteristics, if correlated with both maltreatment and school performance, also may confound efforts to isolate the impact of maltreatment. Maltreatment is over-represented in families with many children (Zigler and Hall 1989). Since large family size in the U.S. also is associated with low academic achievement, controlling for the effects of socio-economic status (Blake 1989; Hanushek 1992), analyses of maltreatment effects on school performance also should control for family size. Other sibship characteristics have also been investigated as determinants of cognitive development. While Zajonc originally focussed on birth order (Zajonc 1976; Zajonc and Markus 1975), more recent investigations indicate that age spacing (Melican and Feldt 1980) or sibship density (Powell and Steelman 1990, 1993), along with sibship size are more important in determining cognitive development and potentially other school outcomes. Since closely spaced children may increase stress to parents and thus increase risk of maltreatment, analyses of maltreatment effects on school outcomes should also control for sibship density.

Parental configuration or family structure, which refers to both the number of adults present in the family and their biological and legal relationship to the child, also appears clearly to influence the child's school performance (Astone and McLanahan 1991; Mulkey, Crain, and Harrington 1992; Thompson et al. 1988;), and some scholars have reported relationships with maltreatment (Gil 1970; Kempe et al. 1962). A recent review (Zigler and Hall 1989), however, equivocates on the issue. Associations with poverty and unemployment may be at work. Controlling family structure is advisable because it may be associated with maltreatment.

Distinguishing Effects of Maltreatment Events From Effects of More Generally Adverse Environment

Findings from this study that maltreatment is significantly associated with poor school outcomes should not lead directly to the conclusion that specific abuse or neglect events are responsible. The strong possibility remains that these specific events are simply part of a more generally adverse environment to which the poor school outcomes really trace. Notable

additional adverse elements of the child's environment can include frequent relocation, substance abuse, criminal activity, insufficient money for the necessities, and irregular parent employment. Statistical controls for poverty status and family structure can help distinguish the effects of maltreatment events from such more general environmental effects, but they will not entirely suffice.

Available theories that link children's home experiences with their school outcomes would interpret maltreatment as part of a more general adverse environment. Thus, a focus on the resources for learning provided by families, such as parental time (Lareau 1989) and summer enrichment (Heyns 1978), points to the general deprivations of a resource-poor environment rather than specific events of abuse or neglect. Equally, poverty and racial minority status are more likely to engender negative labels and diminished teacher expectations because they are easily observed at school, in contrast to abuse and neglect events which may remain private.

Specific maltreatment events, however, may have more severe impacts on a child's schooling than a generally adverse environment. At the extreme, head injuries or other trauma can directly impair functioning relevant to school. While much maltreatment is not this severe, it must typically reach a relatively high threshold to come to the attention of physicians, educators, or neighbors and be reported. Maltreatment that is serious enough to be reported may, in fact, have worse effects on school outcomes than a generally adverse environment even if maltreatment overall does not. Maltreatment may also inject extreme uncertainty into the child's life that, itself, hurts performance or participation in school; uncertainty at these extreme levels may not equally characterize other adverse elements in the child's environment, such as poverty. Finally, abuse or neglect may call forth anger or fear in the child toward the parent that would not be evoked by an adverse environment of which the parent was also a victim. If such emotions transfer to adults at school or otherwise affect the child at school, maltreatment itself would have an especially bad effect on school outcomes.

More successfully than any other study of maltreatment effects on school performance to date, Eckenrode et al. (1993) overcome the methodological problems and conceptual limitations of previous studies. In a prospective design, they compare a random sample of 420 children with substantiated maltreatment reports with an equally-sized comparison group of children not reported as maltreated. The control group is matched with the maltreated group on gender, school, grade level, residential neighborhood, and, when possible, classroom. Eckenrode and his colleagues also apply statistical controls for age and receipt of public assistance. Maltreated children perform significantly lower on standardized achievement tests in both reading and mathematics, earn lower grades in both subjects, are more likely to repeat one or more grades, and have higher rates of disciplinary referrals. Further, neglected children are especially likely to have low test scores and grades and physically abused children are more likely to receive disciplinary referrals, but sexually abused children (unless also neglected) do not to differ significantly from the control group. Finally, they identify several interaction effects with maltreatment: (1) reading, but not mathematics, test scores are

most severely influenced by maltreatment among younger students; (2) grades in both subjects are affected by maltreatment only in elementary and junior high school; and (3) both grades and discipline problems suffer most from maltreatment among children of families not receiving public assistance.

Even Eckenrode and his colleagues' study, however, has important shortcomings. Their study does not consider maltreatment effects on absenteeism, risk of dropping out, or likelihood of special education placement; nor does it control such possible confounding variables as parental education, sibship spacing, and race. In addition, the sample size, though adequate, is modest in the face of the demands of elaborate multivariate analyses, and its design uses a matched comparison group rather than a randomly selected one, so that findings about the comparison group itself cannot be inferred to any population. Moreover, as the investigators readily admit, siting the study in an economically depressed area may limit generalizability of results. Finally, the control group, despite matching by neighborhood, is likely to be much more heterogeneous than the maltreatment group in terms of family factors and other developmental influences. The design of the present study is still more adequate than that of Eckenrode and his colleagues for the task at hand.

ANALYSIS PLAN AND EXPECTATIONS

The first section of the analysis uses measures that summarize the child's maltreatment reports and school performance across the lifecourse. A subsequent section disaggregates the data into maltreatment and school performance events with specific time referents. In the first section, we begin by comparing school outcomes of the maltreatment sample with those of each comparison sample. We expect the school outcomes of maltreated children to be significantly worse than those of school children in general. We do not expect nearly as big a difference between maltreated children and the largely impoverished DSS clientele. We would not be surprised to find statistically insignificant differences for the latter comparison.

We follow the univariate comparisons of school outcomes across samples with multivariate analyses, either ordinary least squares or logistic regression, according to measurement characteristics of the school outcome variable. We estimate the maltreatment effect, controlling for background characteristics, with each of the comparison samples in turn as the reference group.[3]

The regressions distinguish the specific effects of neglect and abuse. Following Eckenrode et al. (1993) and Kurtz and Gaudin (1993), our expectation is that abuse is more likely than neglect to increase the probability of behavior problems. We expect neglect to have its strongest effects on academic achievement measures, including test scores, grades, and retention.

The regressions also include several background variables as statistical controls. Poverty status is a control because of the likely association of poverty with maltreatment, especially neglect. Moreover, we include controls for race, gender, age, and family structure. In the maltreatment-school sample comparison, the control variables refine the total effect observed in the univariate analysis by partialling out confounding correlates. In the maltreatment-DSS sample comparison, we are interested, instead, in the possibility that some of the controls may act as suppressor variables (Rosenberg 1968). If so, significant maltreatment effects may emerge in the multiple regression analyses that were not observed in the zero-order analysis. This would indicate a school outcome difference between maltreated and DSS sample children within categories of one or more control variables.

We recognize that each sample, but especially the school sample by virtue of its representativeness, is quite heterogeneous and that, therefore, even extensive statistical controls may not render the three samples totally comparable. All analyses carry the risk of misinterpretation due to uncontrolled heterogeneity. The controls here are more inclusive of demographic, socio-economic, and family structure factors than most other analyses of maltreatment effects. We will need to be cautious in interpreting the multivariate findings, but we feel the benefits of refining the univariate analysis with statistical controls is so great as to warrant the risks.

Following the comparison of the maltreatment with the school and DSS samples using summary measures, we turn to the longitudinal analysis of time-specific events. Here, we compare school outcomes following time periods that vary in the amount and seriousness of maltreatment. Thus, we substitute comparisons of time periods in the lives of maltreated children for the earlier comparisons of maltreated children with school children in general and with nonmaltreated children receiving social services.

CROSS-SECTIONAL ANALYSIS

This section of the analysis has two parts. First, we compare school outcomes for the maltreatment, DSS, and school samples to determine whether maltreated children are at greater risk of poor school performance than the general school population and the population of children from adverse environments. Second, we examine differences in school outcomes for children who have and who have not experienced maltreatment and for children who have experienced different types of maltreatment. In each case, we control for other characteristics of the child and his or her family.

Overall Differences Associated With Maltreatment

Table 5.1 reports the central tendency on school outcomes for the maltreatment, DSS, and school samples. Except for the dropout and special program involvement variables, we use the sample mean; for these exceptions, we use the sample proportion.

//Table 5.1 about here//

Comparing the Maltreatment and School Samples

Comparisons between the maltreatment and school samples indicate that maltreated children do worse than the general population of school children by statistically significant amounts on all but one reported school outcome measures. These include measures of: cognitive achievement, where CAT scores show more dramatic differences than grades; participation, where the dropout rate for maltreated children is almost four times that for the school comparison sample; and integration into the normal patterns of the school, where retention in grade differs most. We find these important differences even though 15 children with reports of maltreatment from anywhere in the state are included in the school sample and probably slightly adversely affect the school outcome. This basic finding reinforces the predominant conclusions of earlier studies of maltreatment effects on school outcomes. Involvement in a special program is the only school outcome on which the maltreatment sample does not show significantly worse results.

Significant demographic differences between these two samples, make it difficult to conclude through these comparisons alone that maltreatment on its own leads to poorer school performance. Compared with children in the representative school sample, children in the maltreatment sample are more likely to be black and to live in households with only one parent or with neither of their biological parents. In addition, the families of children in the maltreatment sample have more children who are more densely spaced. Finally, children in the maltreatment sample and their families are more than twice as likely to have participated in a governmental poverty program than are children from the representative school sample. Still, less than half of the children in the maltreatment sample are poor by this measure. This signals the diverse social class context of maltreatment.

Comparing the Maltreatment and DSS Samples

The comparison of maltreated children with school children provides a baseline estimate of the effect of maltreatment on school performance. The other contrast in Table 5.1, between maltreated children and children in the DSS sample, begins our comparison of maltreatment's effects with the effects of a generally adverse environment. Poverty is a central element in such an adverse environment. Fifty children with maltreatment reports anywhere in the state have been excluded from the DSS sample to reveal the contrast.

The DSS sample differs significantly from the maltreatment sample on many of the background variables. Each of these significant differences portrays a still more disadvantaging environment for DSS children than for maltreated children. The DSS sample is overwhelmingly black; few families are intact; and the vast majority have participated in a poverty program.

Maltreated children's school outcomes do not differ significantly from those of the DSS sample on any measure except grade point average. Even for this exception, the difference is considerably smaller than the difference between the maltreatment and school samples. These findings should be underscored: the effects of maltreatment on school outcomes are no different than those of adversities of other types that bring children to the attention the DSS. Of course, these zero-order results are subject to refinement after statistical adjustment for the background variables. Suppressor effects could be responsible for the absence of zero-order differences.

We have also compared school outcomes across the three samples separately for the four race-gender groups (tables available on request). The general patterns of substantially larger differences between maltreatment and school samples than between maltreatment and DSS samples holds for the most part in each group. We note also that school outcomes for maltreated children in the four race-gender groups follow the pattern observed among school children more generally that females tend to perform better than males and whites better than blacks (Stockard, Long, and Wood 1985; Kominski 1988). These race and gender trends come together in an extraordinarily high special program placement rate of .439 for black males in the maltreatment sample. Dropout rates in the maltreated sample are a noteworthy exception to the general patterns: for each gender, the white rate is higher than the black rate, significantly ($p < .05$) so for females; and for whites, the female rate is worse than the male. Among, eligible maltreated females, fully 46 percent of whites but only 30.3 percent of blacks drop out.

Multiple Regression Analyses

Of course, these comparisons of univariate statistics alone provide no guarantee that maltreatment, pure and simple, causes the difference in school outcomes between the maltreatment and school samples nor, indeed, that maltreatment effects are indistinguishable from those of an adverse environment. The rest of the analysis is designed to refine these preliminary results. In the following analyses, we are alert to the possibilities that: (1) certain types of maltreatment most adversely affect school outcomes; and (2) correlates of maltreatment may be responsible for spurious observed differences or may suppress real differences from observation. To address these possibilities, the next part of our analysis presents regressions with the various school achievement, participation, and integration outcomes as dependent variables. We assess maltreatment effects against a representative school sample (Table 5.2) and against the effects of other disadvantages, using the DSS sample for comparison (Table 5.3).

The Overall Effect of Maltreatment

Like Table 5.1, Tables 5.2 and 5.3 reveal the overall effect of maltreatment on school outcomes, but they add new information to the simple fact of maltreatment, specifically background variables and measures of the type, frequency, and substantiation of maltreatment. The main body of the tables reports, for each school outcome, regression results for full

models that include both maltreatment and background variables. Two models with different maltreatment information are contrasted, one with number of abuse and number of neglect reports, regardless of substantiation, the other with number of substantiated reports, regardless of maltreatment type. The contrast reveals which kind of maltreatment information best predicts school performance.

//Tables 5.2 and 5.3 about here//

The bottom section of the tables reports, for each school outcome, the model fit for these full models and for a model with the background variables alone. The table further reports the improvement in model fit in comparison with the background variables alone achieved by each kind of maltreatment information and by both kinds together. Unreported regression results are available from the authors.

The incremental statistics that compare the models with maltreatment information with the equation with background variables give the joint effects of various combinations of maltreatment characteristics after taking account of the background characteristics. These tests which add extensive controls, are strict tests of the overall maltreatment effect. We discuss them first, paying primary attention to the improvement in model fit achieved by adding all maltreatment variables (i.e., number of reports, type, and substantiation).

The regressions reveal significant differences for some school outcomes between the maltreatment sample and the school but not the DSS comparison sample. This follows the pattern of Table 5.1 in which the maltreated sample's school performance was regularly worse than the school sample's, but not than the DSS sample's. Within the inference limits of the cross-sectional analysis, we can say that maltreatment has an overall adverse effect on school performance in comparison with the general juvenile population. The effect of maltreatment on these outcomes does not appear to be worse than that of a more generally adverse environment.

The overall deficit associated with maltreatment in comparison with the school sample is restricted to the school achievement outcomes reported in Table 5.2a. Achievement as measured on standardized tests, by grades, and by graduation reflects some combination of cognitive gains and accommodation to the school regime. The results do not allow us to distinguish maltreatment effects on these two components. On such other outcomes as elementary school behavior problems, for which accommodation is probably more important than cognitive gains, the maltreatment effect is considerably smaller. This suggests indirectly that the maltreatment effects on test scores, grades, and dropping out may be due mostly to interference with cognitive growth. This could be due to a variety of factors ranging from brain damage to difficulty in paying attention.

Effects of Seriousness of Maltreatment

Tables 5.2 and 5.3 allow us to identify the specific impacts of three aspects of the seriousness of maltreatment: number of reports, type (i.e., abuse or neglect), and substantiation. Not surprisingly, for none of the significant maltreatment characteristic effects (with the possible exception of the ambiguous neglect reports effect on special program referral in Table 4.2b) does more reports have a beneficial result. More reports is always associated with worse school outcomes. In the rest of this section, we will present other evidence for the importance of number of reports as a consistent indicator of the seriousness of maltreatment. Number of reports assesses primarily the chronicity of maltreatment. A single report may arise from a series of maltreatment episodes, but several reports are unlikely to arise from an isolated event.

The two tables report 14 equations that include number of abuse and number of neglect reports. In seven out of the ten equations in which either of the types of maltreatment is significant, both of them are. This suggests that type of maltreatment is not the aspect of seriousness of greatest importance for understanding the maltreatment effect on school performance but rather that the total number of reports, measured by the sum of the two is most critical. Still, the effects of the two types may be distinct and operate through different processes. In three equations, neglect, but not abuse, has a significant effect, but abuse alone never has a significant effect. Recalling the relationship between neglect and development argued earlier in this chapter, the slightly greater prominence of neglect here is consistent with the greater overall maltreatment effect on cognitive gains demonstrated in these tables. The effect of neglect is noteworthy in light of the control for poverty program participation. The net effect for neglect suggests that neglect does not simply reflect poverty. The importance of abuse for achievement outcomes may derive from both physical and sexual abuse. A physical abuse effect on cognitive gains was not expected under social learning theory which predicted effects more on behavior. Perhaps physical abuse serious enough to be reported impairs the cognitive apparatus fairly often. The impact of sexual abuse may be felt here in the elevated maltreatment sample dropout rate in the form of a generalized flight response to such abuse.

Number of substantiated reports is included in the other 14 equations in the two tables. These equations are specified with this variable alone, without type of maltreatment, so that the impact of type of maltreatment and that of substantiation can be distinguished. It has a significant effect in seven of these equations. Therefore, the information carried by this variable should not be neglected. Other evidence, however, suggests that it is not substantiation, itself, that is responsible for these seven significant coefficients. First, our earlier analysis (Leiter et al. 1994) showed that substantiation added only insignificantly to the explanation of school outcomes achieved with number of reports alone. (Indeed, this is the analysis that led us to include children with only unsubstantiated reports in the current analyses.) Second and similar in argument, across the 14 equations with all three maltreatment variables (not reported in full in these tables but available from the authors), number of substantiated reports has a significant net effect (specifically, net of the numbers of

abuse and neglect effects) in only four cases. These are the two equations for grade point average and for elementary school behavior problems. Third, number of substantiated reports is significant for only one school outcome where neither number of abuse reports nor number of neglect reports is significant: elementary school behavior problems. In the two comparisons for this outcome, no combination of maltreatment variables improves the fit of the model over what is achieved by the background variables alone. All these results add to our confidence that substantiation is not a key aspect of the seriousness of maltreatment, at least for school outcomes.

Overall, then, rather than type of maltreatment or substantiation, number of maltreatment reports, which we interpret as an indicator of chronicity, is the central aspect of the seriousness of maltreatment with an impact on school performance. These are the only maltreatment variables which we could include in an analysis that includes nonmaltreated children from the comparison samples, because zero as a value on these variables describes nonmaltreated children. Age at onset of maltreatment, which developmental theory suggests may have powerful cognitive effects (see Erickson, Egeland, and Pianta 1989) arguably is another important aspect of maltreatment seriousness, cannot be used here because nonmaltreated children have no logical value on it. We will consider this variable in the event-history analysis to follow.

The Effects of Background Variables

We should not leave this discussion of the multiple regressions before noting the important contributions of the background variables to our modeling of school outcomes. We provide this discussion only after alerting readers again to the composition of the overall samples on which these control variables' effects are calculated. This sample is dominated by maltreated children with complements of smaller comparison groups. As a whole, it is far from representative of the general population. As with the maltreatment characteristics, a similar pattern of significance is evident in the comparison of Tables 5.2 and 5.3; therefore, both tables can be discussed at the same time.

Since the background variables include demographic, family structure, and socio-economic factors previously shown to have strong impacts on school outcomes, we are not surprised that, as a group, they are influential here, as well. For each school outcome, in both comparisons, the variance explained by the background variables alone is statistically significant. There is no question that this cluster of variables is important for school outcomes.

The significant effects of the background variables are almost always in the predicted direction. The only exceptions are the race effects on dropping out and absenteeism, where blacks have lower rates than whites. These are consistent with arguments by Armor (1967) and MacLeod (1987) that blacks have higher aspirations for schooling than whites, controlling for social class and aptitude.

Several background variables have pervasive effects. Gender, race, being raised by only one parent or without either parent, and poverty program participation significantly influence at least half the dependent variables in Tables 5.2 and 5.3. Being raised in a blended family influenced almost half. The number of children in the family and sibship density influenced none or almost none of the dependent variables.

EVENT-HISTORY ANALYSIS

In contrast to the cross-sectional analysis, the event-history analysis of maltreatment effects on school outcomes has several advantages. The most important of these is the certainty that maltreatment events precede downturns in school performance. This means that we are not only conceiving of maltreatment as a cause but also measuring it as such. Where we discover significant maltreatment effects, we can now talk about them as causes, not just as associations, subject of course to continuing problems of spuriousness.

A second advantage is that we no longer have to rely on comparisons with nonmaltreated children, who may be quite different from maltreated children, including in unmeasured ways, to estimate the maltreatment effect. Instead, we compare times in maltreated children's school lives when they had experienced less and less serious maltreatment, or even no maltreatment, with other times when they had experienced more.

A third advantage, which flows from restricting our attention to maltreated children, is that we can now include maltreatment characteristics that have no logical meaning for nonmaltreated children, such as age at first report of maltreatment.

Finally, by examining data over distinct time periods, we can assess maltreatment effects on change in school performance rather than on overall levels. Instead of asking, is maltreatment associated with low levels of school performance, we can determine whether the advent or increase in the seriousness of maltreatment causes school performance to decline. It is these adverse changes that we will model in the analyses that follow.

Overall Effect of Maltreatment

Tables 5.4 and 5.5 report the results of the event-history analysis. Table 5.4 treats maltreatment effects on school achievement outcomes. Table 5.5 treats school process outcomes.

//Tables 5.4 and 5.5 about here//

Like the cross-sectional regression analyses that precede this section, we can compare the model fit for the fully specified equations with that for the background variables alone to gauge the overall effect of maltreatment. We find that for each school outcome, except dropping out, maltreatment increases the risk of decline. This is a more general finding of an

overall maltreatment effect than the cross-sectional analysis yielded. In the present analysis, maltreatment adversely affects school process, in addition to school achievement, outcomes. Part of the reason is likely the greater sensitivity that comes from a time-sensitive analysis. No longer, are we straining to recognize possibly short downturns in school performance that may be hidden by the aggregating procedures we had to use to create school performance measures for the cross-sectional analysis. Another reason we now find maltreatment effects on the school process outcomes is likely the additional maltreatment information furnished by age at first maltreatment report and number of reports in the previous 12 months. We note that at least one of these has a significant adverse effect in each process equation.

Dropping out is the only adverse school outcome for which the event-history analysis does not find an overall maltreatment effect. This is in contrast with the cross-sectional analysis which found such an effect in the maltreatment-school sample comparison. Although the same arguments about gains in sensitivity and information, made above, obtain in this case, we are reluctant to conclude that there is no maltreatment effect on dropping out. Actually, the additional maltreatment variables, neither of which is significant here, make it harder to find an effect overall because they increase the degrees of freedom associated with the incremental test. Perhaps more important, however, is the small case base for this outcome. Relative to the other outcomes, which have child-month data bases of upwards of 70,000 observations, here we have only 6156. This small number comes from the short risk period for dropping out (i.e., after reaching age 16) and the small number of maltreated children in our sample who had reached age 16 to enter the risk period. This small case base is figured into the chi-square statistic.

Effects of Specific Aspects of Seriousness of Maltreatment

We now turn to specific aspects of seriousness, looking for differences in the ways that serious maltreatment affects achievement and process. The general finding is clear: as the severity of maltreatment increases in one dimension or another, the hazard of poor school performance increases.

Usually, the overall number of abuse or neglect reports significantly increases the hazard. Having multiple maltreatment reports may reflect a child's chronic exposure to maltreatment, and has a cumulative effect. As some point, the accumulation of maltreatment reaches a threshold, and spills out of the confines of family life and adversely affects the child's school life. One can observe a cumulative effect in all of the school performance outcomes except for falling grade point average and worsening absenteeism.

All of the school process variables are affected by recency of maltreatment. For absences, retention in grade and special program involvement, this effect is indicated by significant coefficients of maltreatment in the last 12 months. For behavior problems, recent maltreatment is indicated by later age at first reported maltreatment. School process variables reflect daily performance rather than accumulated development. The pattern of effects indicates that daily performance is most affected by recent maltreatment.

Falling grades provide an interpretive challenge. It is not clear why the accumulation of maltreatment reports is not significant, but their recency is. To the extent that grades reflect cognitive achievement, and cognitive achievement is a long-term developmental process, this is a surprise. Perhaps in giving grades, teachers respond less to cognitive achievement and more to the level of normative compliance. We may also see this in attendance to which the pattern of coefficients for grade point average is similar.

Overall, the event history analysis demonstrates a more widespread maltreatment effect than the previous cross-sectional analysis. It demonstrates the importance of proximity of maltreatment for certain school outcomes. It confirms, moreover, the fundamental causal influence of chronic maltreatment on school performance. Thus, maltreatment is demonstrated to have both immediate and long term effects.

Background Variables

Interpretation of background variables' effects was problematic for the cross-sectional analysis because of data were not a sample of any identifiable population. In this part of the analysis, however, the population of inference is children with reported maltreatment in the study county during the study period. Hence, we can more readily interpret significant background variable effects.

With one exception, the significant background variable effects are in the expected direction given studies of these variables in general samples. The one exception is the race effect on dropping out, where we recapitulate the finding from the cross-sectional analysis that maltreated African-American are less likely to drop out when eligible than maltreated white students.

Background variable effects are perhaps weaker and more scattered in the event-history analysis than in the cross-sectional analysis. For example, growing up in a family with neither biological parent has a significant effect on only three of seven school outcomes in the event-history analysis, where it had a significant effect in each of the 28 equations presented in the cross-sectional analysis. This is probably due to better measurement of maltreatment's effect in event-history analysis. The background variables' effects may have picked up some unmeasured correlated effect of maltreatment in the earlier analysis.

CONCLUSIONS AND IMPLICATIONS

In these analyses of the effects of maltreatment on school outcomes, we have been able to demonstrate a substantial adverse impact of maltreatment on school performance, even after controlling for diverse known correlates of school performance. This maltreatment effect holds over a wide range of school outcomes including both aspects of cognitive achievement and school integration and participation. This finding suggests that understanding maltreatment effects on school performance may require use of several approaches, including

developmental, social learning, and traumagenic theories. Programs that effectively help maltreated children (through either prevention or the provision of services that heal its effects) should result in payoffs on these critical outcomes.

Maltreated children have been shown here to suffer a significant deficit in comparison with the general school population. Their school performance does not appear to be significantly worse than children who receive social services for other reasons. Since the vast majority of children in the latter comparison sample lives with economic and racial disadvantage and family disruption the relative similarity of their deficit to that of maltreated children is not surprising. Indeed, it is surprising that the single factor of maltreatment has as grave an impact on school performance as the accumulation of factors in the more generally adverse environment of the DSS sample.

We were unable to clearly distinguish among types of maltreatment with regard to the associated school deficits. It may be that such distinctions should not be made. Alternatively, it is possible that with better measurement of types and seriousness of the maltreatment such distinctions will become possible.

The chronic accumulation of maltreatment incidents, signalled by multiple reports, and their recency are the aspects of seriousness to which the event-history analysis directs special attention. We see the chronicity effect in both parts of the analysis but the recency effect only in the time sensitive event-history analysis. We interpret the recency effect as due to the lack of time for the child to adjust to the maltreatment if it continues or to recover from it if it stopped. Alternately, maltreatment that was concentrated at an early age and/or relatively long ago may have allowed for beneficial intervention. We note, however, that prevailing belief among maltreatment researchers holds that maltreatment generally has worse effects if it starts earlier rather than later.

The strengths of these analyses have been their reliance on random samples, the comparison of maltreated children with impoverished and school children in the cross-sectional analysis and the specification of time order in the event-history analysis. Within the limits of the archival data, we have applied multivariate methods and statistical tests to reach important and sometimes surprising conclusions. We have been able to treat causation more adequately than has characterized most research in this area. Furthermore, we have been able to examine and include a wider range of school outcome measures, with more adequate comparison groups, and more complete statistical controls on larger samples than in previous research in this area. As such, we believe that this study lays to rest some of the uncertainty inherent in the previous literature about the causal impact of maltreatment on school.

ENDNOTES

1. We are cautious about these expectations of minor sexual abuse effects, however, in light of a recent review of studies on the impacts of sexual abuse (Kendall-Tackett, Williams, and Finkelhor 1993): in five of six studies of unspecified "school/learning problems" (p. 166), sexually abused children fared worse than (non-clinical) non-sexually abused children.

2. Hutchison (1989) found a similar pattern to differences by type of alleged maltreatment in the decision of child protective services screeners to investigate: sexual abuse reports were about three times as likely and physical abuse reports about twice as likely as neglect reports to be investigated.

3. For the regression analysis, 12 children with substantiated maltreatment reports anywhere in the state are eliminated from the school comparison sample. This allows this comparison sample to function like the DSS sample as a reference group for the effects of maltreatment. This exclusion does, however, diminish the representativeness of the school sample.

Table 5.1: Descriptive Statistics by Sample (number of cases on which statistic is based in parentheses).

	Maltreatment Sample	School Sample	DSS Sample
School Performance			
Mean C.A.T. standard score	-.263 (904)	.362 (199)*[a]	-.295 (123)[a]
Grade point average	2.214 (1302)	2.635 (316)*	2.345 (173)*
Dropped out (when eligible)	.370 (359)	.094 (96)*	.243 (37)
Mean annual Absences	13.500 (948)	9.979 (219)*	11.992 (126)
Prop. poss. elemen. grades behav'r probs.	.205 (1162)	.147 (241)*	.196 (167)
Proportion of years retained	.097 (952)	.047 (219)*	.085 (125)
Special program involvement	.393 (888)	.354 (195)	.331 (118)
Maltreatment Characteristics (1 or more)			
Abuse reports	.439 (1302)	.025 (316)*	
Neglect reports	.679 (1302)	.028 (316)*	
Substantiated reports	.501 (1302)	.035 (316)*	
Background Characteristics			
Race (1=African American)	.552 (1282)	.343 (306)*	.825 (171)*
Gender (1=female)	.544 (1300)	.495 (315)	.570 (172)
Age in years (1989)	13.516 (1302)	13.743 (315)	12.273 (172)*
Family structure			
two biological parents	.289 (1199)	.574 (284)*	.189 (164)*
blended	.096 (1199)	.067 (284)	.043 (164)*
single parent	.426 (1199)	.299 (284)*	.579 (164)*
no biological parent	.189 (1199)	.060 (284)*	.189 (164)
Number of other children in household	1.091 (1302)	.804 (316)*	1.173 (173)
1 or more children within 2 years	.213 (1302)	.158 (316)*	.225 (173)
Poverty program participant	.392 (1302)	.152 (316)*	.844 (173)*

* Significantly different from maltreatment sample at the p=.05 level (1 tailed for maltreatment-school sample comparison in predicted direction; otherwise 2 tailed).

[a] Same finding for CAT-reading and CAT-mathematics considered separately.

Table 5.2a: Regressions[a] of School Achievement Outcomes on Maltreatment and Background Variables, Maltreatment and School Samples

	Mean Standard C.A.T. Score		Grade Point Average		Dropped Out When Eligible	
	1	2	3	4	5	6
Maltreatment Characteristics						
Number abuse reports	-.186*		-.130*		.676*	
Number neglect reports	-.181*		-.191*		.489*	
Number substantiated reports		-.120*		-.115*		.295*
Background Characteristics						
Race (1=African American)	-.456*	-.447*	-.248*	-.239*	-.362	-.409*
Gender (1=female)	.168*	.166*	.223*	.216*	-.028	.047
Age in years (1989)	.007	.008	-.093*	-.092*	.450*	.451*
Family structure						
blended	-.110	-.157*	-.058	-.097	.883*	1.023*
single parent	-.202*	-.236*	-.192*	-.227*	.545*	.665*
no biological parent	-.341*	-.372*	-.225*	-.265*	1.185*	1.324*
Number of other children in household	-.010	-.007	-.015	-.029	.056	.052
1 or more children within 2 years	.040	.037	-.045	-.047	.165	.180
Poverty program participant	-.256*	-.292*	-.159*	-.190*	.161	.259
Intercept	.312*	.205	3.962*	3.865*	-10.002*	-9.706*
Model Fit[b]						
Background variables only	.201*		.271*		479.035*	
This equation	.221*	.209*	.292*	.281*	467.128*	476.328*
Improvement of this equation over background variables only[c]	.012	.009	.021*	.010	11.907*	2.707
Improvement of background and all maltreatment variables over background variables only[c]	.020*		.023*		12.064*	
Number of cases	1060		1451		449	

* Statistically significant at the p=.05 level (1-tailed for background and maltreatment variables' effects).
[a] OLS regression for C.A.T. and grade point average; logistic regression for dropped out.
[b] Adjusted R^2 for OLS regressions; -2 log likelihood for logistic regressions.
[c] Based on unadjusted R^2s for OLS regressions.

Table 5.2b: Regressions[a] of School Process Outcomes on Maltreatment and Background Variables, Maltreatment and School Samples.

	Absences (log)		K-6 Behavior Problems		Retained in Grade		Special Program Involvement	
	1	2	3	4	5	6	7	8
Maltreatment Characteristics								
Number abuse reports	-.057		.014		.021*		-.041	
Number neglect reports	.087*		.008		.025*		-.239*	
Number substantiated reports		.031		.021*		.005		-.037
Background Characteristics								
Race (1=African American)	-.121*	-.119*	.076*	.075*	.022*	.022*	.226	.220
Gender (1=female)	.042	.035	-.081*	-.080*	-.029*	-.029*	-.366*	-.361*
Age in years (1989)	.050*	.050*	-.005*	-.005*	.003*	.003*	-.081*	-.079*
Family structure								
blended	.028	.042	.082*	.083*	.004	.011	.275	.216
single parent	.201*	.222*	.088*	.088*	.022*	.027*	.336*	.282*
no biological parent	.269*	.285*	.076*	.072*	.045*	.053*	.535*	.461*
Number of other children in household	.026*	.026*	.000	.000	.001	.001	.031	.032
1 or more children within 2 years	-.010	-.010	-.008	-.008	.012	.013	.265	-.273
Poverty program participant	.287*	.299*	.003	.003	.022*	.028*	.188	.140
Intercept	1.444*	1.455*	.197*	.196*	.002	.018	.645	.536
Model Fit[b]								
Background variables only	.119*		.076*		.074*		1363.636*	
This equation	.128*	.119*	.076*	.079*	.088*	.074*	1359.274*	1363.493*
Improvement of this equation over background variables only[c]	.011	.000	.001	.003	.016	.001	4.362	.171
Improvement of background and all maltreatment variables over background variables only[c]	.016		.003		.016		4.415	
Number of cases	1051		1266		1055		1060	

* Statistically significant at the p=.05 level (1-tailed for background and maltreatment variables' effects).

[a] OLS regression for absences, behavior problems, and retention; logistic regression for special program referral and placement.

[b] Adjusted R^2 for OLS regressions; -2 log likelihood for logistic regressions.

[c] Based on unadjusted R^2s for OLS regressions.

Table 5.3a: Regressions[a] of School Achievement Outcomes on Maltreatment and Background Variables, Maltreatment and DSS Samples

	Mean Standard C.A.T. Score		Grade Point Average		Dropped Out When Eligible	
	1	2	3	4	5	6
Maltreatment Characteristics						
Number abuse reports	-.110*		-.059*		.143	
Number neglect reports	-.116*		-.134*		-.030	
Number substantiated reports		-.083*		-.087*		.079
Background Characteristics						
Race (1=African American)	-.404*	-.387*	-.218*	-.205*	-.508*	-.509*
Gender (1=female)	.210*	.214*	.221*	.223*	-.092	-.084
Age in years (1989)	.011	.012*	-.091*	-.090*	.465*	.468*
Family structure						
blended	-.036	-.057	.010	-.004	.997*	1.022*
single parent	-.109*	-.117*	-.101*	-.114*	.478	.461
no biological parent	-.285*	-.286*	-.171*	-.180*	.967*	.941*
Number of other children in household	.003	.004	-.019	-.018	.028	.028
1 or more children within 2 years	.030	.028	-.035	-.036	.046	.045
Poverty program participant	-.217*	-.211*	-.136*	-.132*	.129	.106
Intercept	.013	-.085	3.753*	3.670*	-9.225*	-9.274*
Model Fit[b]						
Background variables only	.146*		.244*		437.311*	
This equation	.153*	.150*	.254*	.250*	436.652	437.121
Improvement of this equation over background variables only[c]	.009	.005	.011	.007	.659	.190
Improvement of background and all maltreatment variables over background variables only[c]	.010		.013		.768	
Number of cases	989		1342		392	

* Statistically significant at the p=.05 level (1-tailed for background and maltreatment variables' effects).

[a] OLS regression for C.A.T. and grade point average; logistic regression for dropped out.

[b] Adjusted R^2 for OLS regressions; -2 log likelihood for logistic regressions.

[c] Based on unadjusted R^2s for OLS regressions.

Table 5.3b: Regressions[a] of School Process Outcomes on Maltreatment, Background Variables, Maltreatment and DSS Samples

	Absences (log)		K-6 Behavior Problems		Retained in Grade		Special Program Involvement	
	1	2	3	4	5	6	7	8
Maltreatment Characteristics								
Number abuse reports	-.061		.015		.019*		.129	
Number neglect reports	.093*		.010		.023*		.062	
Number substantiated reports		.034		.023*		.004		.062
Background Characteristics								
Race (1=African American)	-.118*	-.118*	.061*	.060*	.024*	.021*	.306*	.294*
Gender (1=female)	.020	.012	-.093*	-.093*	-.032*	-.033*	-.503*	-.496*
Age in years (1989)	.057*	.056*	-.006*	-.006*	.002*	.002	-.058*	-.057*
Family structure								
blended	.015	.030	.088*	.090*	.003	.007	.454*	.442*
single parent	.173*	.196*	.085*	.085*	.019*	.020*	.520*	.498*
no biological parent	.233*	.251*	.076*	.072*	.038*	.041*	.608*	.570*
Number of other children in household	.007	.007	-.002	-.002	.001	.001	.000	-.001
1 or more children within 2 years	.030	.031	.004	.000	.009	.010	-.212	-.217
Poverty program participant	.248*	.254*	.000	.000	.020*	.018*	.130	.125
Intercept	1.405*	1.418*	.220*	.222*	.014	.037	.018	.021
Model Fit[b]								
Background variables only	.107*		.070*		.048*		1265.483*	
This equation	.118*	.107*	.069*	.073	.059*	.048*	1263.506*	1265.105*
Improvement of this equation over background variables only[c]	.014	.001	.001	.004	.013	.001	1.977	.378
Improvement of background and all maltreatment variables over background variables only[c]	.014		.004		.013		2.336	
Number of cases	981		1217		984		989	

* Statistically significant at the p=.05 level (1-tailed for background and maltreatment variables' effects).

[a] OLS regression for absences, behavior problems, and retention; logistic regression for special program referral and placement.

[b] Adjusted R^2 for OLS regressions; -2 log likelihood for logistic regressions.

[c] Based on unadjusted R^2s for OLS regressions.

Table 5.4: Effects of Maltreatment and Background Variables on the Log Odds of Decline in School Performance for Three School Achievement Measures

	Grade Point Average	CAT--Overall	Dropped Out
Background Variables			
Race (1=African-American)	.203*	-.083	-.644*
Gender (1=female)	-.111	-.212*	-.158
Age dummy I (1=see parentheses)	.082 (<12)	.776* (<15)	-.454* (=16)
Age dummy II (1=see parentheses)			.598* (=18)
Blended family	.083	.038	.633
Single parent family	.216*	.203	.824*
No biological parent in family	.064	.072	.836*
Number other children in household	.022	.017	-.178
1 or more children within 2 years	.041	-.198	.048
Participated in poverty program before this month	.055	.616*	.483
Maltreatment Variables			
Age at first reported maltreatment incident (x 10^{-6})	-17.63	-62.31	91.70
Number reported maltreatment incidents during last 12 months	.303*	-.135	.058
Number substantiated maltreatment reports before this month	.058	-.023	.105
Number abuse reports before this month	-.051	.373*	.394*
Number neglect reports before this month	.085	.261*	.351*
Intercept	-10.104*	-11.024*	-10.378*
χ^2 for improvement in model fit over background variables only (d.f.=5)	18.482*	24.484*	7.778
Number of child-months	73771	84323	6156

*Significant at the p=.05 level, one-tailed.

Table 5.5: Effects of Maltreatment and Background Variables on Log Odds of a Decline in School Performance for Four School Processes Measures

	Absences	Retained in Grade	K-6 Behavior Problems	Special Program Involvement
Background Variables				
Race (1=African-American)	-.163*	.578*	.310*	.466*
Gender (1=female)	-.076	-.391*	-.438*	-.549*
Age Dummy I (1=see parentheses)	-.518* (<15)	.318* (<15)		1.204* (<12)
Age Dummy II (1=see parentheses)		.312 (>18)		-1.416* (>15)
Blended family	.243	.186	.762*	.579*
Single parent family	.183	.388*	.512*	-.378*
No biological parent in family	.128	.544*	.324	.658*
Number other children in household	.030	.016	.019	.038
1 or more children within 2 years	-.121	.088	.096	-.149
Participated in poverty program before this month	.502*	.327*	-.258	.187
Maltreatment Variables				
Age at first reported maltreatment incident (x 10^{-6})	2.405*	1.330	2.399*	1.780*
Number reported maltreatment incidents during last 12 months	.300*	.225*	-.121	-.264*
Number substantiated maltreatment reports before this month	-.023	.106*	-.006	-.029
Number abuse reports before this month	-.042	.118	.324*	.561*
Number neglect reports before this month	.127	.149*	.323*	.366*
Intercept	-9.366*	-10.469*	-10.569*	-11.756*
χ^2 for improvement in model fit over background variables only (d.f.=5)	19.220*	23.132*	17.296*	38.188*
Number of child-months	73149	64506	61952	79539

* Significant at the p=.05 level, one-tailed.

CHAPTER 6

THE MEDIATING EFFECT OF GOOD SCHOOL PERFORMANCE ON THE MALTREATMENT-DELINQUENCY RELATIONSHIP

This chapter forms the heart of our report. Earlier chapters established that maltreated children are generally at elevated risks of both delinquency and poor school performance relative to our two comparison samples. Our intent here is to determine if the observed relationship between maltreatment and delinquency is direct, or, as we believe, maltreatment exerts its influence on delinquency through its strong relationship to school performance. Essentially, we seek to determine if the maltreatment-delinquency relationship holds once the effects of school performance are controlled.

CONCEPTUAL ORIENTATION

Two different research literatures address the maltreatment-delinquency relationship. The first is guided by a broadened "cycle of violence" perspective. It suggests that victims of maltreatment are likely to experience a multitude of detrimental consequences throughout the life-course. These problems range from the development of a poor self-concept (Kinard 1980b) to serious criminal involvement (Widom 1989a). Retrospective studies, asking "What proportion of persons exhibiting negative sequelae have been maltreated?" generally discover large numbers of maltreated children among these groups (Alfaro 1989; Martinez-Roig et al. 1983). Prospective studies (Leiter and Johnsen 1994; Widom 1989a,c; Zingraff et al. 1993), asking "What proportion of maltreated children exhibit negative sequelae?" generally report smaller, yet statistically significant, relationships between maltreatment and the particular sequela examined. On balance, although behavioral, psychological, and emotional dysfunctions are likely consequences of maltreatment, both retrospective and prospective studies of maltreatment suggest that substantial numbers of child victims escape the detrimental effects of maltreatment. Thus, the overly deterministic predictions provided by the broadened cycle of violence approach should be tempered by alternative explanations for the smaller observed relationship between maltreatment and its consequences. In these alternative explanations, other life course events impact the relationship between maltreatment and its consequences.

A second research literature takes this latter observation as its starting point . Children, including maltreated children, are quite resilient in their capacity to cope with and adapt to adverse situations. This literature stresses the importance of children's personal strength and fortitude, social support mechanisms available to the child, and the positive

effects of early identification and direct intervention through treatment (e.g., Garmezy 1991; Moran and Eckenrode 1992; Wyatt and Mickey 1988). On balance, this literature suggests that maltreatment's effects can be ameliorated to some degree.

The two positions need not be viewed as irreconcilable. Certainly, it is reasonable to expect victims of maltreatment to suffer some consequences, especially in the short term. Maltreatment can, and probably does, affect early social and emotional development (Aber et al. 1989). Moreover, healthy early development establishes the foundation upon which long-term commitment to established normative values rests. Still, it does not necessarily follow that children who have been emotionally and socially damaged by maltreatment early in their lives must become adolescent delinquents or adult criminals. There should be room in research on the consequences of maltreatment to identify and understand both the negative impacts of maltreatment and those factors that may protect maltreated children from long-term, persistent dysfunction.

The need to account for both continuity and change is apparent in recent delinquency and criminology research (Caspi, Lynam, Moffitt, and Silva 1993; Laub and Sampson 1993; Nagin and Farrington 1992; White, Moffitt, Earls, Robins, and Silva 1990). Continuity in persistent problems over the life-course is well established (Loeber 1982; Sampson and Laub 1990; White et al. 1990). Children who exhibit early antisocial behavioral patterns or delinquency are at considerable risk of a range of continuing problems (i.e., difficulties with school, employment, marriage, welfare dependency, delinquency, and crime). Continuity has provided the foundation for deterministic explanations of delinquency and crime that view individuals' unfolding social histories or their social environments as essentially irrelevant and their predispositions to impulsive behavior as largely immutable (Gottfredson and Hirschi 1990; Tellegen et al. 1988; Wilson and Herrnstein 1985). In contrast, developmental and life-course criminology (Loeber and LeBlanc 1990; Sampson and Laub 1993) argue that experiences and relationships over the life course may deflect an unfavorable trajectory set genetically or through early child rearing and socialization. The developmental approach directs attention to "key institutions of social control in the transition to adulthood" because of their potential role in shaping normative behavior (Laub and Sampson 1993, p. 304). Individuals need not be locked into any particular trajectory. "The same event or transition followed by different adaptations can lead to very different trajectories" (Elder 1985, p. 35). For the young, school and family stand together as essential social institutions governing the transition to normative behavior.

Maltreatment, especially that which is reported and studied, usually takes place in family settings that are unlikely to set the child on a trajectory toward normative behavior. Abusive adults do not set a good model of self-control for their victims who may learn behavior patterns that lead to trouble with authorities and social institutions in later years. Nonetheless, it is a mistake to overlook all the unpredictable experiences that will follow. These experiences may serve to push the child into delinquency or to deflect the child from it. We see room for both time-stable, enduring predispositions and structural constraints on the one hand, along with state-dependent life course experiences on the other in shaping the

trajectory to delinquent or criminal behavior. Our purpose here is to examine the possibility that adequate school experiences can deflect the maltreated child from the path toward delinquency.

Demonstrating that school performance mediates a significant portion of the effect of maltreatment on the risk of delinquency would have substantial policy implications. Efforts to decrease the incidence of maltreatment and its consequences by interventions in the abusive family have encountered substantial legal and logistical problems. While prevention of maltreatment must remain a paramount goal, we should not ignore the importance of treatment and intervention for current victims. If, as hypothesized, maltreated children's school success is associated with comparatively low levels of delinquency, then interventions to improve the school performance of maltreated children may reduce their probability of delinquency. Abuse or neglect may put children at greater risk of poor school performance, but this does not erect insurmountable obstacles to raising their school performance. Indeed, careful analysis should allow the targeting of school interventions on the children and in the situations where they are most likely to make a difference.

PREVIOUS RESEARCH

Our analysis of the effect of maltreatment on delinquency via school performance implies an interest in three bivariate relationships and one multivariate relationship: the impacts of maltreatment on delinquency, maltreatment on school performance, school performance on delinquency, and maltreatment on delinquency net of school performance. The bivariate relationships are each represented in the research literature, although the number of studies and the consistency of the findings differ considerably across the three. The multivariate relationship has not been previously assessed, to the best of our knowledge. In Chapters 4 and 5, we have reviewed the literature that informs the first two bivariate relationships of interest to this report. In the following sections we assess what is known about the relationship between schooling and delinquency and the reasoning behind our more hopeful position that the maltreatment-delinquency relationship may be disrupted. We then present our analyses.

The Effects of Schooling on Delinquency

A rich body of research consistently links children's difficulties in school to delinquency. Children who do poorly in school, reject the authority of schools and their officials, have low aspirations concerning their probable life-chances upon completion of school, and drop out of school before graduation are at risk of subsequent delinquency (Blumstein, Farrington, and Moitra 1985; Elliott, Huizinga, and Menard 1989; Farnworth, Schweinhart, and Berrueta-Clement 1985; Figueira-McDonough 1983; LaGrange and White 1985; Lane 1980; Smith 1991; Thornberry, Moore, and Christenson 1985; Wiatrowski, Griswold, and Roberts 1981; Wiatrowski, Hansell, Massey, and Wilson 1982). The overall relationship seems to hold regardless of race, gender, or socioeconomic position.

Some argue from a social psychological perspective that school failure, by lowering children's self-esteem and/or denying children desired status, leads them to delinquent involvement in the search for a compensating source of approval and status (Phillips 1980; Pink 1984). When family ties are weak, as may be the case with maltreatment, school failure and any lowering of attachment and commitment to school may pose special problems for the child's attachment to the normative order (Cernkovich and Giordano 1992). Others argue from a structural perspective that schools, primarily through their tracking, grading, and counselling systems, create failure that often follows social stereotypes rather than individual abilities. These failures lead to delinquency via the social psychological routes noted above or by denying children the potential for good jobs (Greenberg 1981). The disproportions of African-Americans and the poor among maltreated children may raise the potential for maltreated children to fail in school due to these structural mechanisms. The remedies implied by these two perspectives differ greatly. The social psychological perspective allows for remedy by individual intervention (e.g., tutoring, counselling, detentions) or simply by virtue of unusual emotional strength. The structural perspective requires change in the schools, themselves.

The Effect of Maltreatment on Delinquency, Controlling for School Outcomes

Evidence to evaluate the importance of schooling for the maltreatment-delinquency relationship could take two forms: (1) the relationship between school performance and delinquency in a sample of maltreated children; or (2) the net relationship between maltreatment and delinquency, holding school outcomes constant, in a sample that includes both maltreated and nonmaltreated children. Except for our own previous analysis with these data (Zingraff et al. 1994), we have found no studies of either type. Our review of previous studies of the bivariate relationships suggests that school performance may mediate the maltreatment-delinquency relationship if we can assume that the association between school performance and delinquency, demonstrated consistently for the general juvenile population, operates among maltreated children, as well. Essentially, we seek to verify this assumption through our research.

The absence of studies of the mitigating effect of school performance on the maltreatment-delinquency relationship contrasts with strong general interest in factors that may mitigate the adverse consequences of maltreatment. Mitigating factors include the mother's emotional support and the stable presence of a male in the household (Farber and Egeland 1987), perceived parental support, gender of the abuser, parental conflict characteristics, family arrest history, and the scope of the child's social supports (Kruttschnitt, Ward, and Sheble 1987), self-esteem and an internal locus of control for good events (Moran and Eckenrode 1992), and geographic mobility (Eckenrode, Rowe, Laird, and Braithwaite, Forthcoming). In each of these studies, the mitigating factors are generally family or individual psychological characteristics that are difficult to manipulate and, therefore, have minimal policy value. In contrast, Garmezy (1991) includes manipulable factors in his review of factors contributing to the resilience of children facing negative life events; he points to support factors external to the family, including a strong mother substitute, a concerned

teacher, and even such institutions as social service agencies, schools, and churches that may integrate the child into the larger community. School performance, in particular, may be more manipulable and of greater policy value as a point of intervention in efforts to avoid adverse impacts of maltreatment on the risk of delinquency.

Statistical demonstration that school performance mediates the maltreatment-delinquency relationship is weakened to the extent that factors correlated with maltreatment, school performance, and delinquency are not controlled. Such third factors must account for both parental and child behavior and, hence, must be inter-generationally inherited, transmitted, or otherwise shared within the same family. The factors meeting this criterion are likely to be quite limited.

Key possibilities include self-control or impulsivity, low intelligence, and poverty. Each of these may be argued to be tied with abusive behavior, poor school performance, and delinquency. Studies have presented evidence for some of these associations (Garbarino 1976; Gottfredson and Hirschi 1990; Jencks et al. 1972; McCarthy and Hagan 1992; Wilson and Herrnstein 1985; Wolfe 1985). There is also reasonable evidence for the inter-generational transmission of these factors. Tellegen et al.'s study (1988) of twins, both identical and fraternal, reared both apart and together, concludes that genetic inheritance accounts for a substantial 44% of variance in control and that the effect of environment is negligible. In a subsequent analysis of mental abilities using the same reared apart sample (Bouchard, Segal, and Lykken 1990), however, they conclude that environmental factors are quite important. Taken together their research suggests that heritability has a limited effect in determining a child's characteristics. In their synthesis of evidence on the heritability of intelligence, Jencks et al. (1972) cautiously conclude that about 45% of the variance in IQ is purely inherited. Concerning the inheritance of poverty, Jencks et al. (1979) conclude that under a third of the variance in adult men's earnings is explained by family background. Thus, while we acknowledge the importance of inter-generational transmission of these factors, we hasten to note that in each case the majority of variance is unexplained by inter-generational inheritance. This means that none of these factors is likely to account for most of the relationships among parental abuse, children's school performance, and children's delinquency.

The Problem of Time Order

With few exceptions, the previously discussed research makes no attempt to substantiate the claim that the maltreatment precedes delinquency. This is a critical problem that impedes our understanding of maltreatment effects. Each of the theoretical perspectives discussed earlier requires that maltreatment occur before the advent of youthful problem behavior. Even studies with prospective research designs (e.g., McCord 1983; Zingraff et al. 1993) have had serious difficulty in establishing the actual time-order of key events and outcomes. This is not to say that researchers have been unaware of the issue. For example, Zingraff et al. (1993) examine the extent to which the impact of maltreatment on delinquency is mediated by school performance. This question suggests the need to document that

maltreatment episodes precede school experiences and that these school experiences precede delinquency. They present aggregate evidence that the preponderance of maltreatment occurs at an early age, that over two-thirds of their sample had not yet entered high school, and that delinquency for the most part occurs in later adolescence. While this is a reasonable argument, their cross-sectional analysis, unfortunately, did not allow them to establish conclusively that the maltreatment episodes, school performance declines, and delinquent involvement they observed for the individuals in their sample occurred in the order presumed by their causal argument.

Two recent studies of the relationship between maltreatment and delinquency use designs in which any delinquency clearly followed the maltreatment. Widom's (1989a) maltreatment sample includes only children who were validated by the juvenile court as abused or neglected before age 11, and only their subsequent delinquent involvement was considered. McCarthy and Hagan (1992) interviewed homeless adolescents about their prior maltreatment and then followed them for eighteen months to detect any delinquency. In both studies, the periods in which maltreatment and delinquency were observed were completely separated. Both studies better establish the time order of maltreatment and delinquency. Still, these designs involve important sacrifices of information about maltreatment and the delinquency career. Possible delinquency in the earlier period reserved for coding maltreatment may have been ignored as well as possible maltreatment in the later period reserved for coding delinquency. The complexity of the maltreatment-delinquency relationship is lost. The event history analysis presented here enables a more inclusive use of important maltreatment events without losing the precise time ordering.

ANALYSIS PLAN

We follow the same general format as presented in previous chapters. First, we present the cross-sectional logistic regression analyses for both the maltreatment-school and maltreatment-DSS comparisons (Table 6.1). Here we examine the contribution of maltreatment net of background and school variables. If a statistically significant maltreatment effect remains after controls for background and school variables we would feel confident that maltreatment directly increases the risk of delinquency. No significant net maltreatment effect would suggest that the maltreatment-delinquency relationship observed in Chapter 4 is actually indirect. That is, maltreatment exerts its influence on delinquency through school performance. In these analyses we use complaints for any offense as the dependent variable. Chapter 4 demonstrated that generally the overall effect of maltreatment persisted across general, property, violent, and status offending once background variables were held constant. Consequently, we generalize the analysis in this chapter to delinquency complaints of any type.

In the second portion of the analysis (Table 6.2), we use event-history analysis to emphasize causal process and the time sequence of important events. This analysis insures that maltreatment events precede any declines in school performance and that declines in school performance precede the advent of any delinquency. We restrict ourselves to the maltreatment sample, comparing maltreated children whose maltreatment characteristics differ.

CROSS-SECTIONAL ANALYSIS

Maltreatment-School Comparison

In Table 6.1, equation 1 highlights the net effect of substantiated maltreatment reports. Equation 2 highlights the net effect of maltreatment types. In this first equation, number of substantiated maltreatment reports has no independent effect on the risk of delinquency once background and school performance variables are statistically controlled. The number of substantiated maltreatment reports does not distinguish maltreated children's risk of delinquent involvement from that of our general school sample. This finding suggests some preliminary support for our position that the effect of maltreatment on delinquency operates through its substantial relationship to poor school performance.

//Table 6.1 about here//

The second equation examines the net impact of maltreatment type. These findings indicate that the number of abuse reports does significantly elevate the risk of delinquency relative to that of the general school sample even with background and school performance variables in the model. While the log-odds parameter estimate for abuse reports is lower than that reported in Table 4.2 (controlling for background variables alone), it is not reduced to statistical insignificance here with the addition of school performance variables to the model.

Neglect reports, on the other hand, have no significant net effect on delinquency complaints. The risk of delinquency of children reported for neglect is statistically indistinguishable from that of the general school sample. Recall that Table 4.2 reported a significant elevated risk of delinquency for neglected children that remained once the effects of background variables were controlled. Here, with the addition of school performance variables to the model, neglect's association with delinquency is substantially reduced. It appears that the projected trajectory toward delinquency for neglected children can be interrupted by better school performance.

Finally, in order to determine the overall contribution of the maltreatment variables examined in this analysis to the risk of delinquency, we entered all three in a single model. The incremental -2 log likelihood test indicates that taken together the maltreatment variables do not significantly improve the fit of the model over that obtained with background and

school variables entered alone. We would conclude from these results that maltreatment as a whole does not have a significant direct effect on delinquent involvement, net of its indirect effect via school performance.

Maltreatment-DSS Comparison

The findings in Chapter 4 indicated that children with substantiated reports of maltreatment were at a significantly greater risk of delinquency than were their nonmaltreated DSS sample counterparts after controls for background variables (Table 4.2). Such is not the case once school variables are added to the model (Equation 3). School performance variables reduce the effect of substantiated reports on delinquency to levels that are statistically indistinguishable from those children in the DSS sample.

Similarly, type of maltreatment is not related to delinquent complaints for a model that includes background and school variables (Equation 4). Neither the number of abuse reports nor the number of neglect reports independently increase the risk for delinquency. Furthermore, the model fit with neglect and abuse reports is no better than that obtained with background and school variables alone. The conclusion to be drawn is that, to the extent that maltreatment influences the risk for delinquency relative to the risk experienced by the DSS sample, its effect is indirect through maltreatment's relationship to school performance.

Effects of Control and School Variables

We do wish to note the contribution of the control and school variables to the respective models for both the school sample and DSS sample comparisons presented above. Because their effects are generally consistent across the two comparisons and regardless of the maltreatment variables examined and because they are not central to the main focus of this report, we will treat them briefly in unison here. For each equation in both comparisons, being male, being older, having more school absences, and being noted for elementary school behavioral problems significantly increase the risk for delinquency. None of these observed effects is surprising.

A few other findings were not anticipated. In the comparison of maltreated with school children, residing in a single parent household does not present an added risk for delinquency relative to children living in a household with two biological parents, and children living with no biological parent are at an elevated risk of delinquency for only one of the two equations. Poverty program participation affects delinquency only in Equation 1 where the effects of the number of substantiated reports is controlled.

In the maltreatment-DSS sample comparisons, one family configuration stands out in both equations for its impact on delinquency. Children living in single parent households are at significantly elevated risk for delinquency, net of other controls. Official poverty status, however, does not distinguish such children from other children in this comparison of two generally high risk samples.

Overall, it would appear that the most consistent school variables associated with delinquency are those that relate to in-school behaviors. Indeed, based upon previous research, we expected that our measures of academic achievement (standardized test scores and grades) would surely account for the risk for delinquency. In neither comparison did standardized test scores increase such risk, and a significant effect for grades was observed in only the maltreatment-school comparison. On the other hand, days absent and elementary school behavioral problems significantly increased the risk for delinquency in all four equations in both comparisons. In effect, observed behavioral problems may be the early indicators of probable delinquency, while the standard measures of successful school performance, usually the focus of research on the school-delinquency relationship, may be consequences of these earlier behavioral problems, themselves. At the least, the association between academic achievement and delinquency is not as clear as the association between school behavioral problems and delinquency.

EVENT HISTORY ANALYSIS

The previous analysis suggests that the relationship between maltreatment and delinquency reported in Chapter 4 is substantially reduced once controls are added for school performance. On balance, the findings suggest that maltreatment's effect on delinquency operates through school performance variables. School policies and programs aimed at rasing the school performance of maltreated children should lead to a further reduction of maltreated children's risk of delinquency.

Still, it is important to recognize that the findings from the logistic regression analyses may not be as clear-cut as they now seem. Our expectation for the mediating effect of school performance requires that we determine with certainty that the maltreatment episode precedes changes in levels of school performance and that these changing levels precede the onset of delinquency. In effect, we have thus far examined a causal proposition without being necessarily true to the time order of events required for causal analysis.

Furthermore, as noted previously, our comparisons of maltreated children to school and DSS children are appropriate only to the extent that the three samples of children are similar after adjustments for the control variables except for the experience of maltreatment. Maltreated children, however, may be quite different from our two comparison samples in ways that we have not captured by our controls for background variables. Finally, the maltreatment characteristics that can be included in the cross-sectional analyses are limited to those with meaningful values for the comparison sample.

Event-history analysis makes it possible to evaluate the causal impact of maltreatment because the time-order of events is precisely known. In addition, this procedure enables us to examine specific time-varying characteristics of the maltreatment experience that are not possible in the earlier analyses. In particular, we examine the effects for age at first maltreatment and number of recent maltreatment reports. If the cross-sectional findings are

valid, we should generally find the same pattern to hold in the event history analysis where the correct time sequence is assured. That is, statistical controls for school performance should eliminate the overall effect of maltreatment. If the logistic regression analyses were complete in capturing the maltreatment experience's effect, the independent effect of the specific time-dependent maltreatment variables examined here should not be statistically significant predictors of delinquency once school performance variables are included. We include the six school performance decline variables one by one in Equations 1 through 6. Then, we construct a full model with all six in Equation 7.

// Table 6.2 about here //

Table 6.2 provides results that are quite different from those obtained through the cross-sectional analysis. Maltreatment significantly impacts delinquent involvement regardless of social background variables or school performance declines. Across all seven equations, the impacts of two maltreatment variables are most pronounced. Late age at first maltreatment and the number of substantiated maltreatment reports up to the time of any school performance decline significantly increase the likelihood that the maltreated child will become involved in delinquency at a subsequent time. This finding holds even where the particular school performance decline exerts its own statistically significant effect.

As noted earlier in Chapter 4, early maltreatment has usually been held most seriously to impact later consequences. In addition, maltreatment has been expected to persist over childhood so that the earlier the onset of maltreatment, the greater will be the accumulation of episodes of maltreatment, which should also lead to more serious problems later in life.

Consistent with the longitudinal analysis reported in Chapter 4, our finding does not support this position as it relates to delinquency. At least for delinquency, the older the child at the time of first maltreatment report the greater the likelihood of delinquent involvement. Here, our interpretation of this finding is directly related to the developmental perspective presented at the beginning of this chapter.

The developmental perspective suggests that the particular vulnerabilities and disabilities associated with maltreatment are determined, in part, by the child's location in the life-course (Cicchetti and Barnett 1991). While maltreatment early in life may well result in lowered self-esteem, mistrust of others, fear, withdrawal, anxiety, anger, and acting out, delinquency for the most part is not an "available" reaction to maltreatment experienced by the very young. Delinquency, especially serious misconduct likely to come to the attention of juvenile justice authorities, is a solution or activity typically reserved for older adolescents. Whereas official recognition of maltreatment for younger children may serve to prevent serious behavioral problems from developing, maltreatment that begins, or at least that which comes to the attention of official agents, in close proximity to the age at which a child is "available" to be recognized as delinquent, may not be as amenable to intervention.

Furthermore, the acting out behavior of older maltreated children may be the type most likely to bring official attention to themselves. Attempts to escape, avoid, or terminate the maltreatment (e.g., by running away from home), retaliation directed at the perpetrators of maltreatment, or displaced aggression toward another person or property are acts likely to come to the attention of authorities (Hagan and McCarthy 1994). Each of these activities can be seen as an attempt by the child to manage the strain resulting from an adverse environment (Agnew 1992). For older children, then, the juvenile justice system may in fact "criminalize" youthful problem behavior that could alternately be categorized as symptoms of "medical" problems (Shanok and Lewis 1977) and place the victims of maltreatment in a position of "double jeopardy" (Hagan and McCarthy 1994). Not only is the reaction of the maltreated child likely to be defined as delinquent; the victim is also now likely to be defined as the offender.

The number of substantiated maltreatment reports is the other maltreatment characteristic with a consistent net effect. It significantly increases the likelihood that the child will become delinquent. Previous researchers have argued (e.g., Widom 1989e) that substantiated maltreatment reports may be more serious than those that are unsubstantiated, and that the more serious the maltreatment experience, the more serious the outcome. Thus, while less serious maltreatment or generally adverse home environments (e.g., poor parenting, improper discipline, unsubstantiated maltreatment reports) may impact a child's social, emotional, and behavioral development in the short term, the most serious long term problems should evidence themselves among children most seriously maltreated. Given that delinquency is problem behavior taken to the extreme, we might expect it to be related most strongly to serous maltreatment experiences.

Recent research addresses the substantiated/unsubstantiated question as it relates to school performance and delinquency. Leiter et al. (1994) report little difference in school outcomes between children with substantiated maltreatment reports and those with unsubstantiated reports but also report that substantiated maltreatment episodes tend to increase the risk of delinquency more then unsubstantiated episodes. Consequently, our finding here that substantiated maltreatment reports have a statistically significant independent effect after controls for other maltreatment, demographic, and school variables can be seen as supportive of an argument that our measure of substantiated maltreatment reports is tapping the seriousness of maltreatment.

Our other maltreatment measures do not allow as clear an interpretation. The number of neglect reports and the number of reports in the last twelve months never significantly affect delinquency. An accumulation of abuse reports does increase the risk of delinquent involvement in several of the equations (1, 4, 5, and 6). Where the school effects are strongest (Equations 2 and 3) and where all six education variables are entered in Equation 7, however, the impact of abuse reports is reduced to statistical insignificance. This echoes findings from the cross-sectional analysis earlier in this chapter.

For each equation, the introduction of the five maltreatment variables significantly improves the fit of the model. Using all available maltreatment information, therefore, indicates that maltreatment has a significant net effect on delinquency. For maltreated children, in other words, the social/demographic profile and school performance declines do not entirely explain delinquency involvement. Accumulated maltreatment experience up to a given time increases the risk of delinquent involvement at that time. This conclusion contrasts with that from the cross-sectional analysis.

Effect of Background and School Performance Decline Variables

Among maltreated children, males, children living without benefit of at least one biological parent in the home, and children in poverty are at greatest risk of delinquency. Similarly, falling grades, and increase in absences from school, retention in grade, and special education program involvement place maltreated children at risk of delinquent involvement. Such findings are generally no surprise. They have all been reported in various combinations in numerous research studies.

Of greatest importance are the results presented in Equation 7. In this equation, all of the school performance declines in cognition and behavior are entered into the model in addition to background variables. The inclusion of all school performance declines does not account for maltreatment's effect on delinquency and the patterned effect of maltreatment is not altered greatly. The difference in the -2 log likelihood scores remains significant after controls are added. This indicates that the delinquency consequence of maltreatment is not accounted for fully by deficits in school performance. Furthermore, with the exception of the loss of a statistically significant abuse effect, older children at first report and those children with higher numbers of substantiated reports prior to the end of the risk period still are more likely to become involved in delinquency. Overall, Equation 7 indicates that maltreatment exerts a significant influence on the risk of delinquency independent of background and school outcomes.

While race and family structure among maltreated children do not independently increase the likelihood of delinquency, poverty program participation and gender do. Boys and children in poverty are at greatest risk of delinquency among maltreated children. Also, the effect of an increase in annual absences from school is particularly crucial for maltreated children. With increased absenteeism the chances of delinquent involvement increase. Indeed, this is the only school decline variable that has a statistically significant independent effect in Equation 7; its impact overshadows any multicollinearity among the school performance decline measures. The maltreatment experience appears to weaken commitment to the conduct norms so expected of children. The importance of absenteeism as a mediating factor in this analysis suggests, however, that presence at school is the prime requirement for school to deflect the maltreated child from a trajectory toward delinquent involvement.

CONCLUSIONS

The cross-sectional analyses reported earlier in this chapter suggested that controls for social background and education measures diminished appreciably the maltreatment-delinquency relationship. This finding held for both the maltreatment-school and maltreatment-DSS comparisons. Consideration of school performance made the delinquent involvement of maltreated children essentially indistinguishable from that of the school and DSS samples. Of course, such analyses were unable to tie specific time referents to any of the variables. This weakened our causal inferences.

The event-history analysis assured us that the time order of events was correct. It showed that the experience of maltreatment exerts a significant impact on delinquency net of social background and school performance declines. This discovery was masked in the cross-sectional analyses that compared the maltreated sample with an impoverished sample and a general school sample. Accumulated substantiated maltreatment reports are more important than accumulated abuse or neglect reports. This may indicate that most serious episodes of maltreatment, as reflected in the substantiation process, are key to the study of delinquency. In turn, serious maltreatment at an age where serious acting out is most probable has a profound impact on the likelihood of delinquency. School can not play a deflecting role in the process unless the maltreated child attends regularly.

Table 6.1 Logistic Regression of Having at Least One Delinquent Complaint on Maltreatment, Background, and Declining School Performance Variables, Maltreatment-School Sample and Maltreatment-DSS Sample Comparisons.

	Comparison with School Sample		Comparison with DSS Sample	
	1	2	3	4
Background Variables				
Race (1=African American)	.065	.116	.021	.066
Gender (1=female)	-.637*	-.652*	-.840*	-.844*
Age	.100*	.096*	.139*	.134*
Blended Family	.090	.074	-.383	-.389
Single parent family	-.447	-.468	-.785*	-.789*
No biological parent in family	.495	.523*	.170	.214
Participated in poverty program before this month	.094*	.072	.001	-.002
Maltreatment Variables				
Number of substantiated reports	.291		.233	
Number of abuse reports		.319*		.266
Number of neglect reports		.114		.110
School Variables				
Mean overall CAT standard score	.143	.154	.088	.089
Grade point average	-.493*	-.505*	-.226	-.247
Mean annual absences	.030*	.031*	.024*	.025*
Proportion of elementary school behavior problems	1.17*	1.20*	1.60*	1.62*
Proportion of grades retained	-1.08	-1.12	-.636	-.686
Involved in special program	.007	-.017	.115	.085
Intercept	-2.83*	-2.84*	-3.64*	-3.62**
Model fit (-2 log likelihood)				
I. This equation[a]	599.8*	599.3*	585.5*	586.0*
II. Backgroud education, and all maltreatement variables[a]	598.1*		584.5*	
III. Background and education variables only	602.1*		587.8*	
IV. Improvement II over III	4.0		3.3	
Number of cases	926		892	

*significant at the p=.05 level (one-tailed for coefficients).

[a] Statistical significance is for improvement in fit from covariates over intercept alone.

Table 6.2 Effects[a] of Maltreatment, Background, and Declining School Performance Variables on the Log Odds of a Delinquent Complaint, Maltreatment Sample Only.

	1	2	3	4	5	6	7
Background Variables[b]							
Race (1=African American)	-.024	-.011	-.029	-.016	-.082	-.063	-.115
Gender (1=female)	-.566*	-.577*	-.556*	-.576*	-.552*	-.541*	-.510*
Blended family	.194	.210	.219	.183	.165	.159	.193
Single parent family	-.126	-.140	-.135	-.142	-.176	-.161	-.174
No biological parent in family	.473*	.461*	.467*	.466*	.402*	.421*	.393
Number of other children in household	.045	.045	.050	.049	.051	.047	.049
1 or more children within 2 years	.158	.124	.125	.147	.166	.222	.172
Participated in poverty program before this month	.578*	.582*	.543*	.595*	.597*	.585*	.515*
Maltreatment Variables							
Age at first reported incident(x 10^6)	2.19*	2.18*	2.21*	2.18*	2.37*	2.34*	2.46*
Number of reported incidents during last 12 months	.049	.069	.142	.027	.026	.010	.167
Number of substantiated reports before this month	.304*	.303*	.304*	.304*	.296*	.315*	.306*
Number of abuse reports before this month	.283*	.265	.209	.301*	.283*	.287*	.166
Number of neglect reports before this month	.189	.155	.091	.196	.175	.217	.042
School Variables[c]							
CAT (overall) fell	.313						.080
GPA fell		.488*					.189
Annual Absences rose			.829*				.697*
Elementary school behavior problems rose				.249			.042
Retained in grade					.355*		.228
Involved in special program						.453*	.325
Intercept	11.4*	11.4*	11.4*	11.4*	11.4*	11.4*	11.5*
Model fit (-2 log likelihood)[d]	1757	1756	1748	1758	1755	1754	1743
Improvement in model fit over background and school performance variables only	13.2*	12.5*	12.0*	13.5*	12.8*	14.1*	11.7*

* Significant at the p=.05 level, one-tailed.

[a] Run with Proc Lifereg under SAS 6.08 for Windows.

[b] Dummy variables for age in current month depend on dependent variable. Details available from authors.

[c] Change in school performance must have happened after first maltreatment report.

[d] No significance level available here.

CHAPTER 7
IMPLICATIONS FOR POLICY AND PRACTICE

On the basis of our accumulated analyses in the three preceding chapters, we are now prepared to make some suggestions for policy and practice in aid of maltreated children and efforts to prevent their delinquent involvement. We first note the relative advantages of this study as a basis for policy prescriptions, and the remaining weaknesses in the study and analyses that should cause policy makers to exercise some caution in considering our recommendations. We then briefly review the findings of our analyses. Finally, we turn to the recommendations, themselves.

STRENGTHS AND WEAKNESSES OF THE STUDY AS THE BASIS FOR POLICY AND PRACTICE

The strengths of this study as the basis for policy making decisions lie in its prospective and comparative design, in the large numbers of variables gathered about a large number of randomly sampled children, and in the longitudinal examination of several characteristics of the maltreatment experience that affect both school performance and delinquency.

The prospective design allowed us to partially simulate with archival data a study in which children from different family environments were actually followed over several years to examine their development in school and their involvement with the juvenile justice system. Such a design allows one to answer the question "What proportion of maltreated children experience problems in school and in the courts?" This is in contrast to the more common retrospective studies of maltreatment which answer the question "What proportion of children with problems in school or in the courts were maltreated?"

The comparison of maltreated children's school performance and delinquency rate with our two other samples has allowed us to bring needed perspective to statements about this troubled population. If maltreated children tend to do badly in school, do they perform significantly worse than school children in general? If maltreated children are at elevated risk of delinquency, is their added risk any greater than that of the tens of thousands of impoverished children in our state? Answers to questions like these tell us whether public dollars need to be targeted at maltreated children or spent more broadly. Whatever the proportion of maltreated children found to experience problems in school and in the courts would remain merely a descriptive portrait of a single group without the comparative base which we have supplied.

The large data set we have gathered, both in number of cases and in number of key variables has allowed more sophisticated, sensitive, and ultimately more useful analyses than have been possible in the past. Our large number of cases enabled us to examine outcomes that, for the most part, are rare events. This is especially true for delinquency. Controls for family structure and poverty, in addition to standard controls for race and gender have isolated maltreatment's net effect on school performance and delinquency.

The random sampling we have followed throughout is critical to our capacity to infer our findings to the populations from which the samples were drawn. The costs associated with gathering information about specific children who fell into our samples are higher than would be the case with quota or other non-probability sampling designs, but the benefits of random sampling for the generalizability of findings with a known probability of error far outweigh these costs.

The longitudinal analyses, as presented in the time-sensitive event history analysis in each chapter, enables us to determine with certainty that the maltreatment experience preceded any downturns in school performance and that the observed school deficits preceded any official delinquency involvement. Specification of the correct time-order of events is an essential component for causal interpretation.

Several issues limit the generalizability of our policy and practice recommendations, although we believe the strengths of the study outweigh them by a considerable margin. The main issue is the difference between our design and a true experimental design. A true experimental design uses random assignment to a treatment or a control group in the context of otherwise identical experimental conditions to rule out all explanations for observed differences in outcomes except the experimental treatment. In our design, no random assignment was possible because all our data concern past conditions and behaviors. Even if we had wanted to attempt an experimental manipulation, we would have faced the substantial danger of revealing the identity of maltreated children to school or juvenile justice personnel not authorized by the Division of Social Services to know these identities. This is the main design problem that will have to be faced if our recommendations about school interventions are to be evaluated in practice using true experimental designs. We have relied on standard multivariate analytic methods that substitute statistical control for experimental control.

An experimental design has another advantage that we have foregone. By the actual manipulation of a purported treatment and the subsequent observation of outcomes, it makes causation explicit and conclusions about cause and effect certain. While our study does not manipulate key causal treatments, it does use event history analysis to address explicitly the time sequences of the important causal process by which maltreatment affects school performance which, in turn, affects delinquency.

FINDINGS

The general rate at which maltreated children have delinquency complaints brought against them in juvenile court is significantly greater than that for the school and DSS samples examined here, although the eleven percent rate for maltreated children is far below that which has been reported in most prior research. The lower rate is line with other recent prospective results but still substantially lower than that reported by the most often cited prospective study to date (Widom 1989a). We suspect this difference arises from differences between Widom's and our maltreatment sampling frames.

On balance, maltreatment makes a difference. The cross-sectional analyses indicate that, in comparison with the general juvenile population, maltreated children are at a significantly elevated risk of delinquent complaints net of race, gender, age, family structure, and poverty. This is true for any complaint, as well as for property, violent, and status complaints. Both type of maltreatment and the number of substantiated maltreatment reports distinguish such children from the school sample. The maltreatment-DSS comparison is not as clear-cut. The risk of delinquency for maltreated children is indistinguishable from that for the DSS sample when maltreatment is characterized by type of report. The number of substantiated reports of maltreatment did, however, distinguish maltreated from DSS children. The finding is consistent across three of the four delinquency outcome measures. This finding is of considerable importance. Whereas any indication of maltreatment raises the risk of delinquent involvement above that of children in general, maltreated children are at a higher risk of delinquency than children served by DSS only to the extent that they have substantiated maltreatment reports. This may indicate that substantiated maltreatment reports have more serious implications for delinquent involvement than those not substantiated. It may also mean, however, that social service agencies do not adequately intervene to remedy the generally abusive environments in which thousands of children live until the most extreme act of abuse arises. Intervention at this point may be, and apparently is, too late to prevent higher rates of delinquent involvement.

The event-history analysis confirms maltreatment's impact on delinquency. Among maltreated children, race, gender, age, family structure, and poverty are not able to account for the maltreatment effect observed. Maltreatment significantly increases the risk of delinquency. This is true for any complaint, as well as, for property and status complaints. Late age at first maltreatment and a number of abuse reports are of special importance in raising the likelihood of any complaint. In addition to age at first report and number of abuse reports, complaints for property offenses are predicted by the number of neglect reports. Substantiated reports of maltreatment strongly predict status offense complaints.

On virtually every school outcome, maltreated children perform at significantly reduced levels compared to the general school population. This is true of achievement measures, including test scores, teacher assigned grades, and the likelihood of dropping out, and also of several process measures, including absenteeism, retention in grade, and elementary school behavior problems. The school outcome deficits maltreated children tend

to experience are not unique to them, however, but strongly resemble those experienced by the total population of children receiving social service assistance. Maltreated children are significantly different from the DSS sample children on only teacher assigned grades.

The regression results further amplify these general differences in the school and DSS sample comparisons with maltreated children. Net of controls for background characteristics, some school outcomes for maltreated children are significantly different from those of the school comparison sample but not the DSS comparison sample. The effect of maltreatment on these outcomes does not appear to be worse than that of a generally adverse environment. The deficit attributed to maltreatment in the school sample comparison, however, is restricted to school achievement outcomes (standardized test scores, grades, dropping out), not school process outcomes (absences, elementary school behavioral problems, retention in grade, special program placement).

The event-history analysis confirms the substantial impact of maltreatment. Indeed, it demonstrates a still more profound impact. For each school achievement and school process outcome examined, except dropping out, maltreatment increases the risk of decline.

The final portion of the analyses addresses the main focus of this study. Previous chapters reported that maltreatment generally placed such children, net of background factors, at elevated risks of delinquency in comparison to the school and DSS sample children. Maltreated children, further, were determined to be at elevated risks for poor school performance with respect to the school sample, though not the DSS sample. Our expectation at the beginning of this study was that the impact of maltreatment on delinquency was most likely to be indirect through its association with poor school performance. This seems to be the case. When controls for school achievement and school process measures are entered into the models, the maltreatment-delinquency relationship diminishes appreciably for both the maltreatment-school and maltreatment-DSS comparisons. Controls for school performance made the risk of delinquency involvement for maltreated children indistinguishable from that of the two comparison samples. In the event history analysis, however, school performance does not account for the full impact of maltreatment on delinquent involvement.

RECOMMENDATIONS FOR POLICY AND PRACTICE

In this section, we will show how these findings can serve to direct public policy and practical efforts. We will try to distinguish policy-relevant findings of three types: (1) those that are true for maltreated children but also for many nonmaltreated children; (2) those that are true only for maltreated children but largely without distinction among them; and (3) those that are true primarily of some subset of maltreated children. From a public policy point of view, findings of the first type do not in themselves suggest targeting efforts at maltreated children; findings of the second type do suggest such targeting, but without special

attention to certain subgroups of maltreated children; and findings of the third type suggest specific targeting at certain subgroups of maltreated children. We will organize our discussion around the three analytic chapters.

The Overall Effect of Maltreatment on Delinquency

1. Maltreated children are at an increased risk of delinquent involvement in comparison with the general juvenile population, but their level of risk is quite similar to that of children served by DSS. From a societal risk point of view, therefore, it may be worthwhile to find ways to decrease the delinquency of maltreated children, but the effort should not be restricted to them. It should extend to the entire DSS juvenile caseload, most of whom are poor. Since the rate of delinquency among maltreated children, while elevated, is, however, not nearly as high as most have previously claimed, we cannot characterize the problem as so severe as to warrant drastic action or "a crash program."

2. It is difficult to distinguish a special risk of delinquency among those suffering from the different forms of maltreatment. Therefore, at the level of a general approach to the problem of delinquency, specifically focusing on one form of maltreatment and ignoring another should be avoided.

3. Substantiated maltreatment and maltreatment that begins in adolescence pose special risks for delinquency. This distinguishes most clearly maltreated children who become delinquent from other children living in generally abusive environments. Social service investigators should be aware of the potential for such children to eventually act out in ways most likely to come to the attention of the juvenile court.

The Effect of Maltreatment (and Poverty) on School Outcomes

1. Maltreatment has a damaging effect on school outcomes, although on most measures impoverished children do just as poorly. Maltreated children need help in succeeding at school, but not as an isolated target group. Such general efforts might well be aimed at reducing absenteeism, grade retention, and poor deportment, all of which are likely to impact achievement as well.

School Performance Effects on Delinquency Among Maltreated Children

1. Among maltreated children, declines in grades, increased absences, retention in grade, and special program placement are associated with the risk of delinquency. Most important, however, is the effect of absences on delinquency. Increased absences, itself a sign or consequence of family neglect, must be avoided at all cost. The positive effects that schools may exert to deflect the trajectory toward delinquency cannot be realized for those the school cannot find.

1. Programs to interrupt the maltreatment-delinquency link by intervention in school should aim at raising grades, cutting dropouts, improving deportment, and boosting attendance. Efforts in the deportment and attendance areas have special advantages as points of intervention. First, improvements in these process variables can be expected to have a payoff for grade improvement and dropout prevention. Second, attendance and deportment are comparatively specific and as such may be easier to attack than other problems that arise from a broad accumulation of other problems. Indeed, most school districts already recognize the importance of attendance for other outcomes and have programs in place to improve it. Finally, these are elements of student behavior that can be addressed in elementary grades where they may already presage delinquency problems in adolescence but before patterns are established that may be impossible to displace.

IMPLEMENTATION ISSUES

This research project has produced specific ideas about how to interrupt the link between maltreatment and delinquency through interventions in school. Implementation raises new issues. First, while helping children when they are gathered together in school may be less expensive then helping them when they are dispersed in their families, the cost of such interventions could be quite high nonetheless. Programs targeted at maltreated children or even specific types of maltreated children would, however, be considerably less expensive than providing the programs for all school children. One value of our analyses has been to identify interventions that make best sense if applied only to maltreated children. Such targeting raises a second issue. Under current state social service law and practice, children who have been reported to the Division of Social Services have no way to be reported to others. The school personnel who would be involved in school interventions to aid maltreated children are clearly not privy to such identifications. Thus, pursuing a cost effective targeting approach would require changes in state law and practice.

Moreover, beyond this confidentiality issue, interagency cooperation of the type envisioned here has been very rare. Reasons abound, from bureaucratic politics to the law. Another reason became very clear to us as we worked to collect our data: North Carolina has no uniform system for tracking the problems and progress of its children. Each agency manages its own client data system. As a result, our biggest obstacle was merging information about maltreated children from the agencies that are central to their lives (and our study). It would also be a major problem facing the most well-meaning effort to implement and evaluate school-level programs aimed at reducing delinquency rates among maltreated children. We suggest that the design, piloting, and implementation of such a uniform child tracking data system be a first priority of any inter-agency effort. We hope our efforts help stimulate such an effort.

This research supports our basic hypothesis and hopeful position that maltreated children are not caught up in an inevitable cycle of violence and crime, but that their future prospects depend on potentially manipulable social processes. Schools may hold at least one of the keys.

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