

New Mexico Children, Youth and Families
Department

Protective and Juvenile Justice Services

Juvenile Delinquency Among Children Involved in a Child
Maltreatment Investigation:
A Longitudinal Study

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EXECUTIVE SUMMARY

New Mexico's Children, Youth and Families Department (CYFD) recently removed the division between its protective services (PS) and juvenile justice services (JJS) agencies in an effort to facilitate an improved and more coordinated delivery of services to families. In support of this effort, CYFD contracted with the Children's Research Center, a division of the National Council on Crime and Delinquency, to conduct a longitudinal study of children involved with PS and then subsequently involved with JJS.

The purpose of this study was to identify children in the PS system who were likely to become JJS clients. The goal was to better focus PS efforts to prevent subsequent maltreatment of children, reduce juvenile crime, and better support families. The sample was children age seven through fourteen involved in a PS investigation of child maltreatment during 1999. The key findings are summarized below.

- Approximately one-sixth (13.9%) of these children were referred to JJS in the four years following the sampled investigation.
- Children ten or older had much higher delinquency rates than did children nine or under. Just over 20% of children older than nine were referred, while 5.5% of children of age seven to nine were referred.
- Males were more likely to become delinquent compared to females (17.3% vs. 10.9% referred, respectively, and 11.5% vs. 5.8% petitioned).
- Substantiation of the 1999 PS incident had no effect on delinquency rates. The delinquency referral rate was 13.6% among children involved with a substantiated incident and 14.1% among those involved in unsubstantiated investigations.
- Family risk factors were related to subsequent delinquency, while safety factors were not. The household characteristics with a strong relationship to subsequent delinquency included caretaker substance abuse, prior arrest of a caretaker, sharing a household with a developmentally disabled child or a child with a mental health concern, and multiple PS investigations.

- After controlling for child and family characteristics with logistic regression, older children and males still had the greatest odds of subsequent delinquency.
- Excluding age and gender, repeated involvement with PS had the greatest impact on the odds of subsequent delinquency. Multiple PS incidents had a greater estimated impact on the likelihood of future delinquency for seven- to nine-year-old children than for children ten or older.
- Additional characteristics significantly impacted estimated delinquency outcomes for children age ten through fourteen. Households with one or more developmentally disabled children significantly increased the likelihood of every delinquency outcome estimate. Living with a child with a mental health issue also increased the likelihood of delinquency, though to a lesser degree. Primary caretakers with a substance abuse problem increased the odds of a subsequent petition or adjudication. In addition, their substance abuse increased the likelihood of petition for a violent offense.
- Interestingly, children age ten or older placed in foster care as a result of the sample incident were estimated to have significantly lower odds of a subsequent delinquency referral and adjudication.

The family characteristics estimated to increase the likelihood of a child becoming delinquent are easily identifiable and therefore provide a means of targeting services. Prevention efforts focused on families with more than one PS investigation or with one or more developmentally disabled or emotionally disturbed children may be more successful at reducing future delinquency.

INTRODUCTION

Although researchers and human service agency administrators know that children who are abused and/or neglected are more likely to become delinquent later in life, less is known about which maltreated children become delinquent, and what family characteristics increase the risk of a child's subsequent delinquency. A much better understanding of the families and children served by protective services (PS) and juvenile justice services (JJS) is required to identify the most problematic cases that could benefit from preventive intervention.

Any preventive intervention must be carefully targeted, which first requires systematic assessment of all families investigated for abuse or neglect of a child. New Mexico Children, Youth and Families Department (CYFD) began assessing the risk factors and service needs of families and children entering the PS system in a structured way in 1998. A new initiative in the state is to eliminate the division between PS and JJS systems in an effort to facilitate an improved and more coordinated delivery of services to families. To promote this integrated approach, CYFD contracted with the Children's Research Center, a division of the National Council on Crime and Delinquency (NCCD), to conduct a longitudinal study of children who entered the PS system and then subsequently entered the JJS system.

This research sought to identify children in the PS system who are likely to be delinquent so that preventive service interventions can be designed to reduce future juvenile crime. The goal was to better focus PS to prevent subsequent maltreatment of children, reduce juvenile crime, and better support families.

BACKGROUND

Researchers and administrative staff of human service agencies know that youth who experience maltreatment are more likely to experience emotional and social dysfunction. Youth who experienced maltreatment as children have higher rates of depression and suicide attempts (Widom 1996; Silverman, Reinherz, and Giaconia, 1996), as well as other mental health/social problems (Kelley, et. al., 1997; Silverman et. al., 1996; Briere and Elliott, 1994). Children with a history of abuse/neglect have greater treatment needs than others, but they also pose more risk to public safety. Research has shown that maltreated youth tend to have less social control, tend to be angrier, and are more likely to commit assaults and other violent acts (Brenzina, 1998; Briere and Elliott, 1994; Malinosky-Rummell and Hansen, 1993).

Youth alleged to have been or were victims of abuse or neglect are more likely to be arrested and/or referred for delinquent offenses (Swanston et. al., 2003; Widom and Maxfield, 2001; Johnson-Reid and Barth, 2000; Widom and Kaufman, 1999; English, 1998; Kelley, et. al., 1997; Widom, 1996; Smith and Thornberry, 1995; Pawasarat, 1991). They are more likely to be delinquent at a younger age (Lemmon, 1999) and are also more likely to become an adult offender (English, Widom and Brandford, 2002). Furthermore, the offenses these youth commit are more often violent in nature (Widom and Maxfield, 2001; English, 1998; Kelley, et. al., 1997; Widom, 1996).

Earlier research showed that previously maltreated youth who entered New Mexico's JJS system often had severe treatment needs and posed a high risk to public safety.¹ The long-term involvement of maltreated children with multiple human service agencies has large public and human costs. A child may be initially identified in a child abuse/neglect investigation, then migrate

¹ According to Structured Decision Making™ (SDM) JJS reports, 35% of youth adjudicated between April-June 2001 had a prior history of abuse/neglect. Compared to other delinquent youth, maltreated youth in New Mexico entered the correctional system earlier; nearly one-third were 12 or under at their first adjudication. They were much more likely to have serious emotional/mental health problems, substance issues, and school problems than others. They had higher violent felony adjudication rates and were more likely to be committed to a secure facility.

through a number of public agencies including juvenile justice, foster care, income maintenance, and adult corrections. PS agency staff have one of the first opportunities to intervene with children who are likely to progress from the child welfare system to delinquent or adult offender systems. The current challenge is to identify these children and develop practical and effective interventions to prevent future delinquency.

STUDY METHODS

Methodology

The primary research objective was to examine the number of children in New Mexico investigated by PS who were subsequently involved with JJS. The goals were to identify:

1. the characteristics of children most at risk of becoming delinquent, and
2. which children and families would best be served by preventive services.

The data source for this study was CYFD's management information system called FACTS. The agency has been recording PS case information in FACTS since late 1997, and began recording JJS information in 2000.

The sample selected was 6,259 children between the ages of seven and fourteen involved in a PS investigation during 1999.² Each child was tracked for a standardized four-year period to obtain information about subsequent JJS involvement. A key task of this effort was to match the FACTS PS and JJS data. While there is a common identification number linked to each child, staff indicated that children involved with both services often received different identification numbers. An identification code composed of the child's last name, first name, and date of birth was created to

² While most children were alleged victims of abuse or neglect, 203 (3.2%) were not alleged victims but household members and/or siblings of a victim.

ensure the accuracy of matches. This code resulted in much greater accuracy and so became the primary means of data matching.

As mentioned previously, this retrospective study intended to profile children involved with PS by measures of future delinquency and identify the child and family characteristics most strongly related to future delinquency. The measures of juvenile delinquency were:

- Referral to JJS for a delinquent offense (in other words, criminal charges). Charges for status violations (such as disorderly conduct or running away) were excluded unless they were associated with a criminal offense.
- Petition to the court for a delinquent offense. Petitioned offenses served as a type of proxy for more serious situations, because sufficient evidence and/or behavior problems are typically present before an officer/supervisor petitions a youth.
- Adjudication for a delinquent offense. This represents a greater level of seriousness given that the court has found that an offense occurred and may assign a youth to community supervision or commitment.
- Referrals, petitions, and adjudications were also collected by the nature of the offense, such as property, sex, drug, and violent offenses.

Following the 1999 investigation of child maltreatment at which time the sampled child was identified, additional PS involvement was observed if it occurred within one year of the sample incident and, if the child was delinquent, prior to the first delinquency referral. This ensured that any additional PS allegations occurred prior to a child becoming delinquent and could therefore be assessed relative to delinquency outcomes.³

The FACTS system also contains Structured Decision Making™ (SDM) assessment results that were examined relative to the outcome measures. The safety, risk, and family needs and strengths assessments describe the characteristics of the sample PS investigation and the household at that time. Workers complete a safety assessment after the first contact with a child and/or family

³ In other words, assessed as independent variables.

during a PS maltreatment investigation. This assessment helps evaluate whether the home is a safe environment and if a child should be removed from the home. At the end of an investigation, workers complete an actuarial risk assessment to classify families by the likelihood that they will abuse or neglect a child in the future. Workers reference the risk assessment to help decide whether or not to open a case for a family. For the families eligible for services, workers also complete a family needs and strengths assessment to identify what family issues should be addressed in a case plan.

Because needs assessment results were not available for all families investigated in 1999, these data were not reviewed in this report. Also excluded was safety assessment information which had little to no relationship to delinquency outcomes.⁴ This may be, in part, because workers complete a safety assessment at the beginning of an investigation. Household risk factors, however, often proved to be related to a child's subsequent delinquency and were a prominent part of analyses. Methods of analyses included bi-variate and multi-variate cross-tabulations, as well as logistic regression.

Characteristics of the Sample

Child Demographics

Children in the sample ranged in ages from seven to fourteen, the majority of whom were ten years of age or older (see Table 1). Just over half (52.1%) were female, and half (49.7%) were Hispanic. An additional 32.5% were White/Caucasian, 8.6% were Black/African American, and 3.8% were American Indian/Alaskan Native.

⁴ Please see Appendix A for more details.

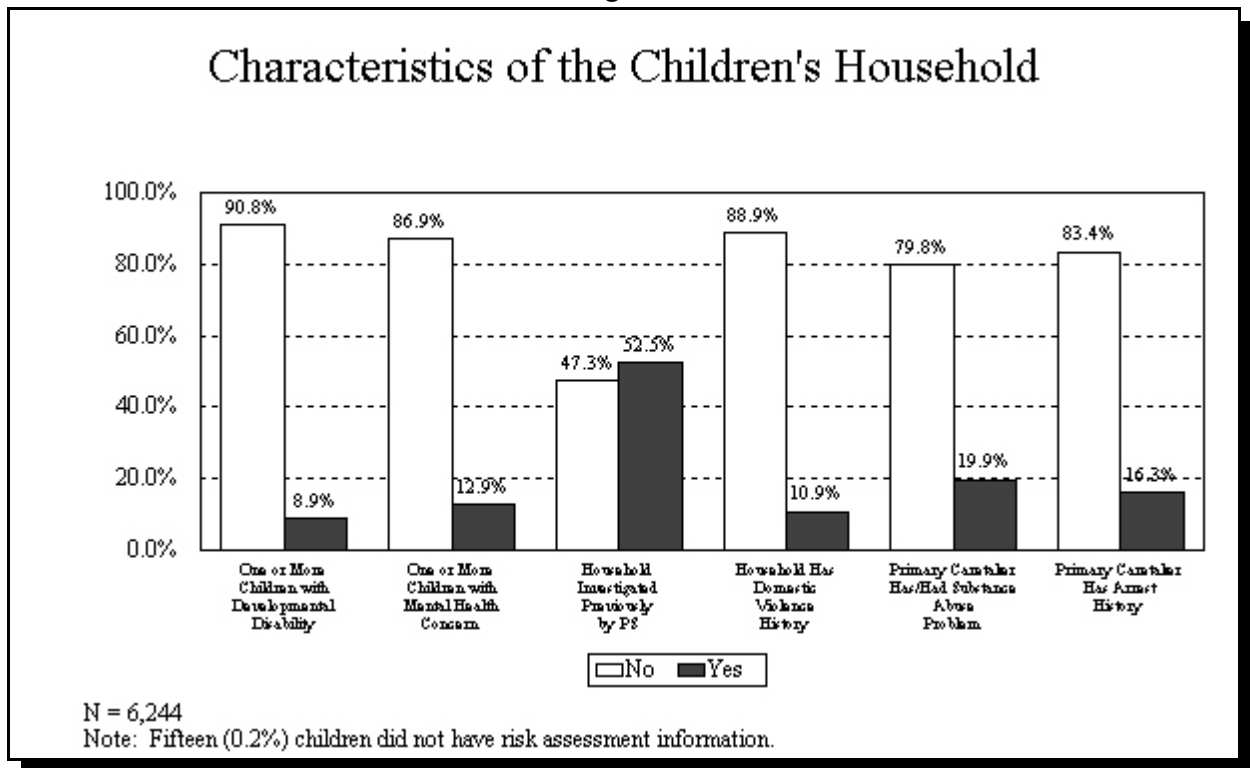
Table 1		
Characteristics of Sampled Children		
	N	%
Total Sample	6,259	100.0%
Child Age		
7 years	963	15.4%
8 years	902	14.4%
9 years	884	14.1%
10 years	805	12.9%
11 years	691	11.0%
12 years	693	11.1%
13 years	705	11.3%
14 years	616	9.8%
Child Gender		
Male	2,990	47.8%
Female	3,258	52.1%
Missing	11	0.2%
Child Ethnicity		
White/Caucasian	2,033	32.5%
Hispanic	3,111	49.7%
American Indian/Alaskan Native	237	3.8%
Black/African American	538	8.6%
Asian/Pacific Islander	34	0.5%
Unknown	306	4.9%

Family Risk Factors

Figure 1 shows the prevalence of risk factors among the sampled children.⁵ As mentioned previously, these characteristics reflect the household in which the sample child lived at the time of the 1999 investigation. The characteristics are not specific to the sampled child. For example, 8.9% of the children lived in a household with one or more developmentally disabled children. This may be the sampled child or it may be another child in the home, such as a sibling.

More than half (52.5%) of the households of the sampled children had at least one prior PS investigation. Nearly twenty percent (19.9%) of the children had a primary caretaker with a substance abuse problem at some time, and 16.3% had a primary caretaker with an arrest history.

Figure 1

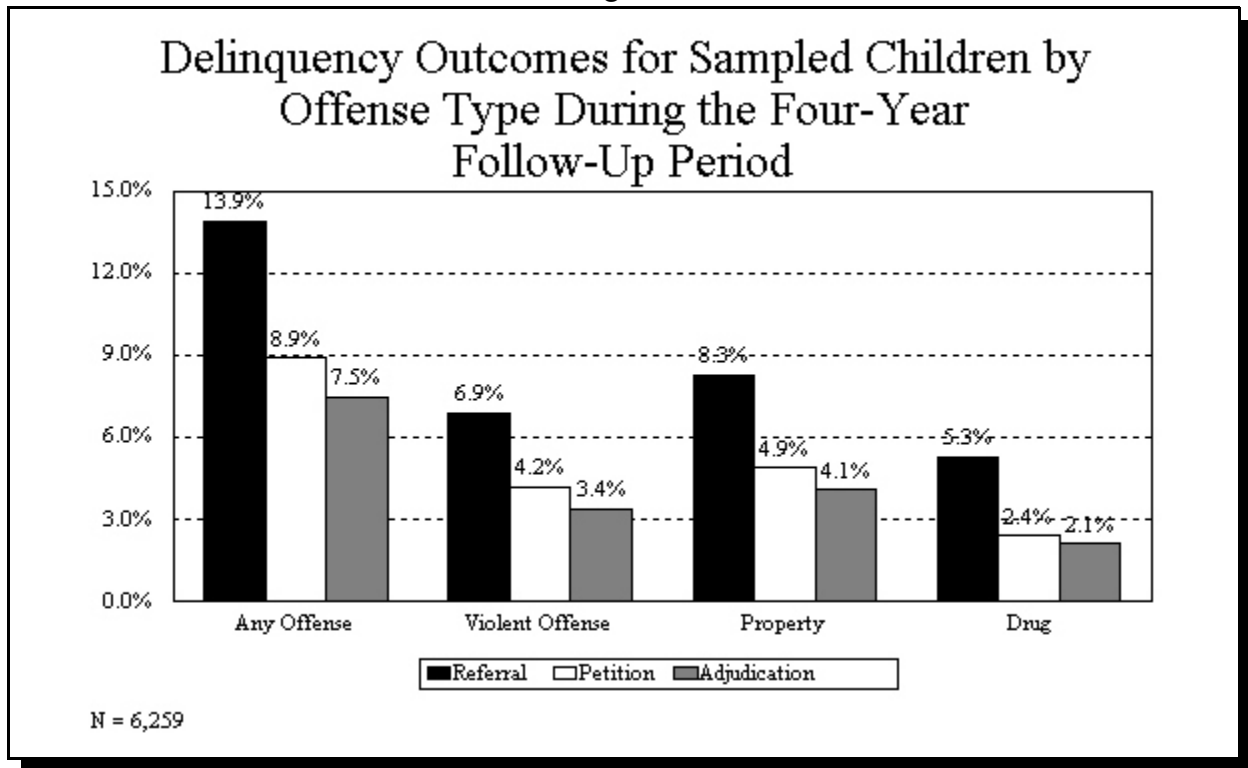


⁵ Prevalence is child rather than family based. A household may be represented more than once since some of the children in the sample were siblings.

Delinquency Outcomes

Overall, among the children from age seven through fourteen sampled from a 1999 investigation of child maltreatment allegations, 13.9% became juvenile offenders in the next four years (see Figure 2). Less than 10% of the children were petitioned (8.9%) or adjudicated (7.5%) for delinquency during the follow-up period. A child could have had multiple offense types, though property offenses were the most prevalent. Only 6.9% were referred for a violent offense and 5.3% for a drug offense.

Figure 2



FINDINGS

Subsequent Delinquency by Child and Family Characteristics

Table 2 reviews the sampled children's age, sex, and ethnicity in 1999 by the juvenile delinquency measures. The delinquency rates increased with a child's age. Not unexpectedly, a greater percentage of males were referred, petitioned, and adjudicated for a delinquency offense. Hispanic and American Indian/Alaskan Native children had the highest delinquency rates.

Table 2					
Child Demographics by Subsequent Juvenile Delinquency					
	Total N	Subsequent Delinquency Referral	Subsequent Delinquency Petition	Subsequent Delinquency Adjudication	Subsequent Violent Delinquency Petition
Total Sample	6,259	13.9%	8.5%	7.5%	4.2%
Child Age *					
7 years	963	2.3%	0.7%	0.6%	0.3%
8 years	902	5.1%	1.7%	1.6%	0.7%
9 years	884	9.3%	4.8%	3.6%	2.5%
10 years	805	15.7%	8.1%	7.1%	4.8%
11 years	691	23.3%	13.5%	11.9%	6.5%
12 years	693	22.8%	16.2%	14.4%	7.1%
13 years	705	24.1%	17.0%	15.2%	8.4%
14 years	616	17.5%	13.0%	11.2%	6.0%
Child Gender *					
Male	2,990	17.3%	11.5%	10.2%	5.6%
Female	3,258	10.9%	5.8%	4.9%	2.9%
Missing	11	9.1%	0.0%	0.0%	0.0%
Child Ethnicity *					
White/Caucasian	2,033	10.7%	6.3%	5.6%	3.0%
Hispanic	3,111	17.2%	10.8%	9.5%	5.0%
American Indian/Alaskan Native	237	15.2%	8.4%	7.6%	5.1%
Black/African American	538	12.5%	7.4%	6.5%	4.6%
Asian/Pacific Islander	34	5.9%	2.9%	2.9%	2.9%
Unknown	306	5.6%	2.9%	1.6%	2.0%

* All cross-tabulations with this characteristic were significant at the .05 level (Pearson's chi square).

Delinquency outcome rates did not differ by characteristics of the sampled child protective services investigations (see Table 3). For example, 13.6% of children with substantiated allegations had a delinquency referral during the standardized four-year period, and the rate was 14.1% for children with unsubstantiated allegations. Overall delinquency rates were similar regardless of the type of allegations, whether or not a child was physically injured, and whether or not a child was placed out of the home.

Table 3					
Child Allegation Characteristics by Juvenile Outcomes					
Investigation Information⁶	Total N	Subsequent Delinquency Referral	Subsequent Delinquency Petition	Subsequent Delinquency Adjudication	Subsequent Violent Delinquency Petition
Overall Sample	6,259	13.9%	8.5%	7.5%	4.2%
Allegation					
Abuse only	1,560	13.3%	8.3%	7.3%	3.7%
Neglect only	3,394	14.3%	8.8%	7.7%	4.5%
Abuse and neglect	1,102	13.8%	8.2%	6.9%	3.6%
Any Allegation Substantiated					
No	4,303	14.1%	8.7%	7.5%	4.2%
Yes	1,753	13.6%	8.3%	7.4%	3.9%
Type of Substantiation					
None	4,303	14.1%	8.7%	7.5%	4.2%
Abuse only	615	14.8%	9.3%	8.3%	4.9%
Neglect only	948	13.1%	7.3%	6.9%	3.4%
Abuse and neglect	190	12.6%	10.0%	7.4%	3.7%
Physical Injury Resulted from Substantiated Abuse/Neglect					
No	5,456	13.8%	8.4%	7.4%	4.1%
Yes	600	15.8%	9.8%	8.3%	4.5%
Placement Resulted from Substantiated Abuse/Neglect					
No	5,662	14.2%	8.6%	7.5%	4.2%
Yes	394	10.7%	7.6%	6.3%	3.3%

⁶ Of the 6,259 children in the sample, 203 were not alleged to have been a victim (they were siblings of victims). Of these 203 children, 27 (13.3%) had a subsequent delinquency referral, 16 (7.9%) had a subsequent petition, 15 (7.4%) had a subsequent adjudication, and nine (4.4%) had a petition for a violent offense.

Subsequent Delinquency by Family Risk Factors

Differences in juvenile delinquency rates were observed for some characteristics of the household (see Table 4).⁷ Children residing in a home with a developmentally disabled child or a child with a mental health concern⁸ were more likely to be delinquent in the subsequent four years.⁹ Among children in a home with a developmentally disabled child, 26.7% were referred and 20.4% were adjudicated for delinquent acts. In comparison, 12.7% children not residing with a developmentally disabled child, had a subsequent referral and 6.2% were adjudicated. Children residing in a home with a child who had a mental health concern were also more likely to be referred, petitioned, and adjudicated for a delinquent offense than were children living in a home with no such children. The presence of these factors, children residing in a home with a developmentally disabled child or in a home with a child who had a mental health concern, was also correlated with the highest rates of subsequent petition for a violent offense.

Children in households with a prior history of child protective services involvement also had higher rates of delinquency. Table 4 shows that 17.2% of children from a household with two or more prior PS investigations had a delinquency referral, compared to 15.7% of children in households with one prior investigation and 11.2% of children with no prior investigations. Of children in households that received services in the past to address child maltreatment allegations,

⁷ Fifteen (0.2%) children did not have risk assessment information and are excluded in analyses of risk variables.

⁸ As mentioned previously, these characteristics were collected in the family risk assessment and are based on the household. Reliable data about the status of the children's education and health were not available for all sampled children. Some child-based disability information was available for children placed out of the home, but these children were a very small proportion of the sample. We therefore know only whether or not one or more children living in the home had a developmental disability or mental health problem. It could be the alleged child victim, or another child, or both.

Whether or not a child in the home was developmentally disabled or a child was emotionally disturbed were cross-tabulated with the number of children in the home. Of the 559 children in a household with a developmentally disabled child, 75 (13.4%) were the only child. Of the 805 children in a household with a child that had a mental health problem, 115 (14.3%) were the only child.

⁹ Risk assessment information was not available for 15 of the 6,259 children in the sample. These 15 children had no delinquency referrals in the next four years.

10.5% were petitioned and 8.9% were adjudicated for a delinquent offense. Corresponding rates for children in homes with no prior service were 8.0% and 7.1%.

Higher delinquency rates were also observed when certain characteristics of the primary caretaker were present. Children whose primary caretaker had a problem with alcohol or marijuana at some time had higher referral, petition, and adjudication rates. These delinquency rates were even greater for children whose caretaker had a problem with other drugs, although the difference was not significant. A greater proportion of children in homes with domestic violence in the last year were referred (15.7% compared to 13.8%) and adjudicated (8.7% compared to 7.3%) for a delinquent offense during the four-year follow-up period. Children whose caretaker had an arrest history also had higher rates of delinquency.

Table 4					
Household Characteristics by Juvenile Outcomes					
Risk Factors⁷	Total N	Subsequent Delinquency Referral	Subsequent Delinquency Petition	Subsequent Delinquency Adjudication	Subsequent Violent Delinquency Petition
Overall Sample	6,259	13.9%	8.5%	7.5%	4.2%
One or More Children in the Home with a Developmental Disability*					
No	5,685	12.7%	7.2%	6.2%	3.6%
Yes	559	26.7%	22.4%	20.4%	10.2%
One or More Children in the Home with a Mental Health Problem*					
No	5,439	13.3%	7.8%	6.9%	3.7%
Yes	805	18.6%	13.8%	11.7%	7.2%
One or More Children in the Home with Delinquency History					
No	5,352	13.8%	8.4%	7.4%	4.0%
Yes	892	14.9%	9.4%	8.0%	4.9%
Number of Prior Child Protective Services Investigations*					
None	2,959	11.2%	6.7%	5.9%	3.3%
One	1,469	15.7%	9.3%	8.0%	3.7%
Two or more	1,816	17.2%	11.0%	9.6%	5.9%
Household Has Received Child Protective Services in Past*					
No	4,912	13.1%	8.0%	7.1%	3.9%
Yes	1,332	17.2%	10.5%	8.9%	5.3%
Primary Caretaker¹⁰ Has or Had Substance Use Problem**					
None	4,996	13.6%	8.1%	7.1%	3.9%
Alcohol/marijuana	934	15.3%	9.5%	8.1%	4.4%
Other drugs	314	16.9%	12.7%	11.1%	7.0%

¹⁰ Findings were the same when the question was whether either caretaker has or had a substance use problem.

Table 4					
Household Characteristics by Juvenile Outcomes					
Risk Factors⁷	Total N	Subsequent Delinquency Referral	Subsequent Delinquency Petition	Subsequent Delinquency Adjudication	Subsequent Violent Delinquency Petition
Overall Sample	6,259	13.9%	8.5%	7.5%	4.2%
Domestic Violence					
No	5,564	13.8%	8.4%	7.3%	4.2%
Yes	680	15.7%	10.0%	8.7%	4.3%
Caretaker Has Prior Arrest Disclosed^{**}					
No	5,222	13.8%	8.2%	7.1%	3.8%
Yes	1,022	15.1%	10.6%	9.6%	5.9%

* All cross-tabulations with this characteristic were significant at the .05 level (Pearson's chi square).

** Cross-tabulations with subsequent petitions, adjudications, and violent petitions were significant at the .05 level (Pearson's chi square).

Additional Child Maltreatment in the Next Year

Approximately 40% of the children in this sample were alleged to be abused or neglected again during the year following the 1999 investigation. Table 5 shows that subsequent allegations and confirmed abuse or neglect were associated with higher rates of delinquency. Nearly twenty percent (19.3%) of children with a subsequent allegation were referred for delinquency in the next year, compared to 10.2% of children with no allegations in the next year. Among children with a subsequent physical injury that resulted from abuse or neglect, 20.1% were referred and 11.5% were adjudicated for a delinquent offense. Corresponding rates for children with no such physical injury were 13.6% and 7.2%.

Table 5					
Additional Child Maltreatment Allegations During the Next Year by Juvenile Outcomes					
Additional PS Involvement⁷	Total N	Subsequent Delinquency Referral	Subsequent Delinquency Petition	Subsequent Delinquency Adjudication	Subsequent Violent Delinquency Petition
Overall Sample	6,259	13.9%	8.5%	7.5%	4.2%
Additional Investigation of Any Type of Allegation* in the Next Year					
No	3,686	10.2%	6.1%	5.2%	2.6%
Yes	2,573	19.3%	12.1%	10.7%	6.4%
Additional Investigation of an Abuse Allegation* in the Next Year					
No	4,893	12.9%	7.8%	6.8%	3.7%
Yes	1,366	17.9%	11.0%	9.7%	5.6%
Additional Investigation of a Neglect Allegation* in the Next Year					
No	4,010	10.7%	6.1%	5.3%	2.6%
Yes	2,249	19.7%	12.9%	11.3%	6.8%
Additional Allegations by Type* in the Next Year					
None	3,686	10.2%	6.1%	5.2%	2.6%
Abuse only	324	16.4%	6.8%	6.2%	3.1%
Neglect only	1,207	21.0%	13.3%	11.8%	7.2%
Abuse and neglect	1,042	18.3%	12.3%	10.8%	6.4%
Additional Allegation Substantiated* in the Next Year					
No	5,060	12.5%	7.5%	6.6%	3.6%
Yes	1,199	20.0%	12.8%	11.0%	6.4%
Additional Physical Injury Resulted from Substantiated Abuse/Neglect* in the Next Year					
No	5,901	13.6%	8.2%	7.2%	4.0%
Yes	358	20.1%	13.7%	11.5%	7.0%
Placement Resulted from Additional Substantiated Abuse/Neglect in the Next Year					
No	6,011	13.8%	8.4%	7.4%	4.1%
Yes	248	18.1%	11.7%	10.1%	5.6%

* All cross-tabulations with this characteristic were significant at the .05 level (Pearson's chi square).

Comparison of Males and Females: Subsequent Delinquency by Child and Family Characteristics

As noted previously, males had higher rates of delinquency than females. Just over 10% of females were referred for a delinquent offense, compared to 17.3% of males referred during the four-year follow-up period.

Table 6 shows that the influence of household and other characteristics sometimes differed for males compared to females. For example, among both males and females, those living in a home with one or more developmentally disabled children had significantly greater delinquency referral rates than children who did not. The referral rate among females, however, was 60% greater, while the difference among males was 136%.¹¹ When comparing the rates of children with additional PS involvement in the subsequent year and those that did not, a greater increase in the referral and the petition rate was observed for females compared to the increases observed for males.

The characteristics related to the highest rates of delinquency differed by gender. Among all females, those with a subsequent physical injury from child abuse or neglect had the highest rate of referral for a delinquent offense. Among males, the children in a home with one or more developmentally disabled children had the greatest proportion referred.

¹¹ The percentage increase is the difference between the percentages divided by the lower percentage. For example, males with no additional investigations had a rate of 6.9%, compared to 16.3% for those that did; this is a 136 % increase ($(16.3 - 6.9) / 6.9 = 1.36$).

Table 6						
Child and Family Characteristics by Subsequent Delinquent Activity						
Characteristics ⁷	Male			Female		
	Total N	% with Delinquency Referral	% with Delinquency Petition	Total N	% with Delinquency Referral	% with Delinquency Petition
Overall Sample	2,990	17.3%	11.5%	3,258	10.9%	5.8%
Allegations by Type						
None	72	16.7%	11.1%	130	11.5%	6.2%
Abuse only	733	17.2%	11.2%	825	9.9%	5.8%
Neglect only	1,694	17.6%	11.8%	1,694	11.0%	5.8%
Abuse and neglect	491	16.7%	11.0%	609	11.5%	5.9%
<i>Significant Chi Square (at .05 Level)</i>						
Primary Caretaker Has or Had Substance Use Problem¹²						
No	2,396	16.6%	10.8%	2,592	10.8%	5.7%
Yes	588	20.6%	14.6%	657	11.3%	6.5%
<i>Significant Chi Square (at .05 level)</i>						
Household Has a Domestic Violence History						
No	2,665	17.0%	11.3%	2,890	10.8%	5.7%
Yes	319	20.1%	13.5%	359	12.0%	7.0%
<i>Significant Chi Square (at .05 level)</i>						
Primary Caretaker Has an Arrest Record						
No	2,494	17.0%	10.9%	2,718	10.9%	5.7%
Yes	490	19.4%	14.9%	531	11.1%	6.6%
<i>Significant Chi Square (at .05 level)</i>						
One or More Children in the Home with a Developmental Disability						
No	2,701	15.4%	9.4%	2,973	10.4%	5.2%
Yes	283	36.4%	31.4%	276	16.7%	13.0%
<i>Significant Chi Square (at .05 level)</i>						

¹² Findings were the same when the question was whether either caretaker has or had a substance use problem.

Table 6						
Child and Family Characteristics by Subsequent Delinquent Activity						
Characteristics⁷	Male			Female		
	Total N	% with Delinquency Referral	% with Delinquency Petition	Total N	% with Delinquency Referral	% with Delinquency Petition
Overall Sample	2,990	17.3%	11.5%	3,258	10.9%	5.8%
One or More Children in the Home with a Mental Health Problem						
No	2,535	16.5%	10.5%	2,893	10.5%	5.5%
Yes	449	22.3%	17.6%	356	14.0%	9.0%
<i>Significant Chi Square (at .05 level)</i>		*	*			*
Household Has a Prior Child Protective Services Investigation						
No	1,408	14.0%	9.2%	1,541	8.6%	4.5%
Yes	1,576	20.4%	13.6%	1,708	13.0%	7.0%
<i>Significant Chi Square (at .05 level)</i>		*	*		*	*
Investigation of Any Child Maltreatment Allegations During the Next Year						
No	1,783	13.7%	9.0%	1,894	6.9%	3.3%
Yes	1,207	22.7%	15.2%	1,364	16.3%	9.3%
<i>Significant Chi Square (at .05 level)</i>		*	*		*	*
Physical Injury Resulted from Substantiated Abuse/Neglect During the Next Year						
No	2,843	17.1%	11.2%	3,047	10.3%	5.5%
Yes	147	21.1%	17.7%	211	19.4%	10.9%
<i>Significant Chi Square (at .05 level)</i>			*		*	*

Comparison of Children by Age: Subsequent Delinquency by Child and Family Characteristics

The child and household characteristics related to a significant increase in the proportion of children subsequently referred and petitioned for a delinquent offense did not differ by a child's age (see Table 7). Sampled children of all ages, had significantly higher rates of delinquency when in a household investigated previously for child abuse or neglect, and when the child was an alleged victim in the year following the 1999 PS investigation. A greater proportion of children, regardless of age, were referred for delinquency when living in a home with one or more children with a mental health problem or a developmental disability.

Table 7						
Child and Family Characteristics by Subsequent Delinquent Activity						
Characteristics⁷	Children Seven to Nine Years of Age			Children Ten to Fourteen Years of Age		
	Total N	% with Delinquency Referral	% with Delinquency Petition	Total N	% with Delinquency Referral	% with Delinquency Petition
Overall Sample	2,749	5.5%	2.3%	3,510	20.6%	13.4%
Allegations by Type						
None	89	9.0%	5.6%	114	16.7%	9.6%
Abuse only	625	5.4%	2.7%	935	18.6%	12.1%
Neglect only	1,562	4.9%	1.9%	1,832	22.4%	14.6%
Abuse and neglect	473	6.8%	2.5%	629	19.1%	12.4%
<i>Significant Chi Square (at .05 level)</i>					*	
Primary Caretaker Has or Had Substance Use Problem¹³						
No	2,213	5.3%	2.1%	2,783	20.1%	12.9%
Yes	530	6.0%	3.4%	718	22.8%	15.5%
<i>Significant Chi Square (at .05 level)</i>						

¹³ Findings were the same when the question was whether either caretaker has or had a substance use problem.

Table 7

Child and Family Characteristics by Subsequent Delinquent Activity

Characteristics ⁷	Children Seven to Nine Years of Age			Children Ten to Fourteen Years of Age		
	Total N	% with Delinquency Referral	% with Delinquency Petition	Total N	% with Delinquency Referral	% with Delinquency Petition
Overall Sample	2,749	5.5%	2.3%	3,510	20.6%	13.4%
Household Has a Domestic Violence History						
No	2,433	5.4%	2.3%	3,131	20.2%	13.1%
Yes	310	5.8%	2.6%	370	24.1%	16.2%
<i>Significant Chi Square (at .05 level)</i>						
Primary Caretaker Has an Arrest Record						
No	2,261	5.7%	2.3%	2,961	20.0%	12.6%
Yes	482	4.6%	2.3%	540	24.4%	18.0%
<i>Significant Chi Square (at .05 level)</i>						
One or More Children in the Home with a Developmental Disability						
No	2,629	5.1%	2.1%	3,056	19.3%	11.6%
Yes	114	13.2%	7.0%	445	30.1%	26.3%
<i>Significant Chi Square (at .05 level)</i>						
One or More Children in the Home with a Mental Health Problem						
No	2,461	5.0%	2.0%	2,987	20.1%	12.6%
Yes	282	9.2%	5.3%	523	23.7%	18.4%
<i>Significant Chi Square (at .05 level)</i>						
Household Has a Prior Child Protective Services Investigation						
No	1,289	3.3%	1.2%	1,670	17.2%	11.0%
Yes	1,454	7.4%	3.3%	1,831	23.8%	15.7%
<i>Significant Chi Square (at .05 level)</i>						
Investigation of Any Child Maltreatment Allegations During the Next Year						
No	1,548	3.2%	1.2%	2,138	15.2%	9.6%
Yes	1,201	8.3%	3.8%	1,372	28.9%	19.3%
<i>Significant Chi Square (at .05 level)</i>						
Physical Injury Resulted from Substantiated Abuse/Neglect During the Next Year						
No	2,616	5.4%	2.3%	3,285	20.1%	12.9%
Yes	133	6.8%	3.0%	225	28.0%	20.0%
<i>Significant Chi Square (at .05 level)</i>						

Comparison of Children by the Family’s Protective Services History: Subsequent Delinquency by Child and Family Characteristics

Table 8 shows that additional PS allegations in the year following the 1999 investigation increase the likelihood of delinquency referrals and petitions even for children whose 1999 investigation was the first contact with PS. The proportion of children referred for delinquency in the follow-up period nearly doubled with additional PS investigations for children with a prior PS history (11.8% compared to 20.9%), as well as those without one (9.0% compared to 16.3%). Children whose primary caretaker had substance abuse, domestic violence, or a prior arrest record, had significantly higher referral and petition rates among children whose household had a prior PS history.

Table 8						
Child and Family Characteristics by Subsequent Delinquent Activity						
Characteristics⁷	No Prior PS Investigation			Prior PS Investigation		
	Total N	% with Delinquency Referral	% with Delinquency Petition	Total N	% with Delinquency Referral	% with Delinquency Petition
Overall Sample	2,959	11.2%	6.7%	3,285	16.5%	10.2%
Allegations by Type						
None	97	10.3%	6.2%	106	16.0%	9.4%
Abuse only	874	11.6%	7.2%	679	15.8%	9.9%
Neglect only	1,490	11.2%	6.5%	1,898	16.8%	10.6%
Abuse and neglect	498	10.4%	6.6%	602	16.6%	9.5%
<i>Signification Chi Square (at .05 level)</i>						
Primary Caretaker Has or Had Substance Use Problem¹⁴						
No	2,524	11.5%	6.9%	2,472	15.7%	9.3%
Yes	435	9.4%	5.7%	813	19.1%	12.8%
<i>Significant Chi Square (at .05 level)</i>						

¹⁴ Findings were the same when the question was whether either caretaker has or had a substance use problem.

Table 8						
Child and Family Characteristics by Subsequent Delinquent Activity						
Characteristics⁷	No Prior PS Investigation			Prior PS Investigation		
	Total N	% with Delinquency Referral	% with Delinquency Petition	Total N	% with Delinquency Referral	% with Delinquency Petition
Overall Sample	2,959	11.2%	6.7%	3,285	16.5%	10.2%
Household Has a Domestic Violence History						
No	2,702	11.4%	6.7%	2,862	16.0%	10.0%
Yes	257	8.9%	7.0%	423	19.9%	11.8%
<i>Significant Chi Square (at .05 level)</i>					*	
Primary Caretaker Has an Arrest Record						
No	2,627	11.4%	6.7%	2,595	16.2%	9.6%
Yes	332	9.3%	6.6%	690	17.8%	12.5%
<i>Significant Chi Square (at .05 level)</i>						*
One or More Children in the Home with a Developmental Disability						
No	2,778	10.0%	5.5%	2,907	15.4%	8.8%
Yes	181	29.3%	25.4%	378	25.4%	20.9%
<i>Significant Chi Square (at .05 level)</i>					*	*
One or More Children in the Home with a Mental Health Problem						
No	2,677	10.4%	6.0%	2,762	16.1%	9.5%
Yes	282	18.1%	13.5%	523	18.9%	14.0%
<i>Significant Chi Square (at .05 level)</i>					*	*
Investigation of Any Child Maltreatment Allegations During the Next Year						
No	2,102	9.0%	5.2%	1,577	11.8%	7.2%
Yes	857	16.3%	10.5%	1,708	20.9%	12.9%
<i>Significant Chi Square (at .05 level)</i>					*	*
Physical Injury Resulted from Substantiated Abuse/Neglect During the Next Year						
No	2,826	10.6%	6.3%	3,061	16.4%	10.0%
Yes	133	22.6%	15.0%	224	18.8%	12.9%
<i>Significant Chi Square (at .05 level)</i>					*	*

The Relative Significance of Child and Household Characteristics

The previous examination of case characteristics by outcomes showed that delinquency rates differed with the presence of some child and family attributes. It is possible, however, that observed differences may result from the impact of other characteristics. For example, children living in households with a prior PS history were significantly more likely to be referred and petitioned for a delinquent offense during the follow-up period compared to those in households with no prior investigations. If the households of older children were more likely to have a PS history, then this difference may in part be the result of the age of the child. We would not know the true effect of prior PS investigations without controlling for sex and other child characteristics.

A multivariate analysis of each delinquency outcome can help determine whether an observed higher rate of delinquency is attributable to a child's gender or age, for instance, or other case and referral characteristics. The primary referral characteristics examined in the multivariate analyses were ones that had a significant relationship to delinquency outcomes. These include the gender and age of the child, whether the child was placed as a result of the sampled 1999 investigation, if there were subsequent allegations in the year following the sample incident, household characteristics such as domestic violence and/or PS history, whether a child in the home had a mental health problem or was developmentally disabled, and the primary caretaker's substance abuse or arrest history.

Logistic regression was used to estimate the impact of the previously reviewed characteristics on the likelihood of a child's subsequent delinquency. This method is used to model dichotomous outcomes, such as whether an event occurred. It also controls for other case characteristics that may be related to that outcome. When all of the case characteristics are regressed on an outcome, the influence of each independent characteristic is isolated by controlling for all of the other attributes.

Table 9 shows the logistic regression findings when case characteristics were modeled to estimate subsequent referrals for a delinquent offense. The first column specifies the characteristic examined, while the second column shows its estimated beta coefficient (β)¹⁴ and its significance.¹⁵ The third column shows the estimated odds ratio and its confidence interval.¹⁶ The 95% confidence interval indicates the range of values between which the actual odds ratio is likely to be. In other words, we can be 95% confident that the true odds ratio falls between the estimated ratios given.

An odds ratio of one indicates that the presence of this characteristic does not have an impact on the odds of the estimated event occurring. An odds ratio of greater than one means greater than average odds, while less than one indicates reduced odds. The confidence interval provides useful information about the strength of the estimated odds. If the lower ratio of the confidence interval is below one and the higher ratio is above one, we cannot be sure if the characteristic referenced increases, decreases, or has no significant effect on the outcome within the given model. If, however, the lowest value of the confidence interval is well above one, we can be 95% sure that the characteristic significantly increases the odds of the outcome occurring, given this estimation of the outcome.

For example, in the estimate for a subsequent delinquency referral, children living in a household that had a domestic violence history had an estimated odds ratio of 1.085. Although its confidence interval was above one, the lowest and highest estimated ratios (0.958 – 1.228) were very close to one. This indicates that living in a household with a domestic violence history had no impact on the estimated likelihood of being referred for delinquency. Being ten or older, however,

¹⁴ Logistic regression models the logarithm of the odds of success for variables or outcomes with two choices (for example, yes or no). The equation is $\log(p/1-p) = \beta_0 + \beta_1x$, where p is the proportion of success and x is the explanatory variable.

¹⁵ Significance is at the .05 level and is based on the Wald statistic.

¹⁶ The odds ratio is the exponent of the beta coefficient, and its confidence interval is the exponent of β plus or minus the standard error.

had an estimated odds ratio of 4.964. In other words, being older than nine years of age significantly increases the odds of a delinquency referral. The confidence interval for this estimated ratio indicates that we can be 95% sure that the actual odds ratio for age ten or older falls within 4.089 and 6.025.

Children age ten or older, in fact, were estimated to have the greatest odds of becoming delinquent after controlling for all other characteristics.¹⁷ Other significant factors which increased the odds of delinquency were being male, living in a household with prior PS involvement, and a household with one or more developmentally disabled children. Children placed as a result of the sampled 1999 investigation had significantly lower odds of subsequent delinquency.

¹⁷ Child age was evaluated as categorical (under ten vs. ten or older) and ordinal (seven through ten). In this estimate, a categorical analysis was more appropriate. Categories were decided by looking at means, medians, and standard deviations.

Table 9		
Logistic Regression Results for Subsequent Juvenile Delinquency Referral		
Case Characteristics	All Children	
	B	Odds Ratio (confidence interval)
Male	*0.641	1.898 (1.625-2.218)
Child age ten or older	*1.602	4.964 (4.089-6.025)
Placed as a result of sample investigation ¹⁸	*-0.403	0.668 (0.470-0.950)
One or more developmentally disabled children in home	*0.525	1.691 (1.347-2.122)
One or more children in home with mental health concern	-0.012	0.988 (0.795-1.228)
Primary caretaker has or had a substance abuse problem	0.001	1.001 (0.816-1.228)
Primary caretaker has a prior arrest record	0.056	1.058 (0.848-1.320)
Household has a domestic violence history	0.081	1.085 (0.958-1.228)
Household has a prior PS investigation	*0.284	1.329 (1.130-1.562)
Child involved in another PS investigation in the year following the current incident	*0.799	2.224 (1.898-2.605)
Constant	-3.864	
Chi Square (df)	557.721 (10)	
-2 Log Likelihood	4329.344	
% Classified Correct	85.9%	
Total Cases	6,031	

Note: A star before the beta coefficient indicates a significant Wald statistic at the .05 level.

¹⁸ These placements were coded in FACTS as out-of-home placements. "Facility placements" was another option in addition to out-of-home placements, but was not available in the data extracted for this study. This suggests, however, that these placements were foster home rather than institutional placements. The mean placement was 167 days and the median was seven.

Placements both in home and into foster care have been found to decrease the risk of incarceration for Black/African American and Hispanic youth (Jonson-Reid and Barth, 2000).

A child's age clearly had a significant effect on the likelihood of delinquency. Children under ten had much lower delinquency rates than the children age ten through fourteen (5.5% and 20.6% with a subsequent referral and 2.3% versus 13.4% with a subsequent petition, respectively).

It is possible that the child and household characteristics significantly related to subsequent delinquency differed for children under ten. To test this, each delinquency measure was estimated for three groups: all sampled children, children under ten, and children ten through fourteen. The following tables review the characteristics significant to each delinquency measure for these three groups.

When subsequent delinquency referral was modeled separately for the above mentioned age groups, several of the same child characteristics had a significant effect in the estimate. Additional child maltreatment allegations in the year following the sample incident had the highest odds ratio among children under ten as well as ten or older (2.47 and 2.21, respectively, see Table 10). Even when separated by age, it was estimated that older children were more likely to become delinquent, as were males.

The estimate for children ten or older showed additional influences on subsequent delinquency than for children under ten. One or more developmentally disabled children in the household significantly increased the odds of a referral, and placement that resulted from the sample incident decreased the odds of a delinquency referral only among children ten or older.

Table 10

Logistic Regression Results for Subsequent Juvenile Delinquency Referral

Case Characteristics	All Children		Children Age Nine or Younger		Children Age Ten or Older	
	B	Odds Ratio (confidence interval)	B	Odds Ratio (confidence interval)	B	Odds Ratio (confidence interval)
Male	0.641	1.898 (1.625-2.218)	0.877	2.403 (1.655-3.487)	0.616	1.852 (1.557-2.204)
Child age ten or older	1.602	4.964 (4.089-6.025)				
Age of child			0.736	2.088 (1.652-2.638)	0.075	1.078 (1.013-1.147)
Placed as a result of sample investigation	-0.403	0.668 (0.470-0.950)			-0.526	0.591 (0.395-0.885)
One or more developmentally disabled children in home	0.525	1.691 (1.347-2.122)			0.465	1.592 (1.244-2.038)
Household has a prior PS investigation	0.284	1.329 (1.130-1.562)	0.687	1.988 (1.332-2.968)	0.205	1.22 (1.027-1.467)
Child involved in another PS investigation in the year following the current incident	0.799	2.224 (1.898-2.605)	0.903	2.468 (1.688-3.609)	0.795	2.214 (1.857-2.641)
Constant	-3.864		-10.361		-3.083	
Chi Square (df)	557.721 (10)		119.019 (10)		177.834 (10)	
-2 Log Likelihood	4329.344		988.134		3279.810	
% Classified Correct	85.9%		94.6%		79.0%	
Total Cases	6,031		2,648		3,383	

When the estimated outcome was a subsequent petition for a delinquent offense, findings were similar (see Table 11). Males and older children were significantly more likely to be petitioned in all three estimates. Children age ten or older from a household with a developmentally disabled child and a caretaker with an arrest record also had significant odds of being petitioned. In the estimate for children younger than ten, the very high odds ratios for additional PS allegations and prior investigations of the household (3.30 and 2.07, respectively) suggest that multiple incidents have a great impact on a seven- to nine-year-old child's likelihood of a future delinquency petition.

Table 11						
Logistic Regression Results for Subsequent Juvenile Delinquency Petition						
Case Characteristics	All Children		Children Age Nine or Younger		Children Age Ten or Older	
	B	Odds Ratio (confidence interval)	B	Odds Ratio (confidence interval)	B	Odds Ratio (confidence interval)
Male	0.841	2.318 (1.904-2.823)	1.323	3.753 (1.998-7.048)	0.832	2.298 (1.861-2.838)
Child age ten or older	1.963	7.121 (5.373-9.439)				
Age of child			1.019	2.772 (1.870-4.109)	0.142	1.153 (1.070-1.242)
One or more developmentally disabled children in home	0.870	2.388 (1.858-3.069)			0.797	2.218 (1.697-2.899)
Primary caretaker has a prior arrest record					0.350	1.419 (1.067-1.887)
Household has a prior PS investigation	0.221	1.247 (1.020-1.525)	0.730	2.074 (1.095-3.929)		
Child involved in another PS investigation in the year following the current incident	0.793	1.817 (2.690)	1.194	3.300 (1.776-6.132)	0.781	2.183 (1.769-2.694)
Constant	-4.973		-14.414		-4.646	
Chi Square (df)	507.348 (10)		87.750 (10)		198.009 (10)	
-2 Log Likelihood	3025.892		477.800		2488.365	
% Classified Correct	91.3%		97.8%		86.3%	
Total Cases	6,031		2,648		3,383	

As was true for the previously estimated outcomes, a child ten or older has the greatest odds of a delinquency adjudication in the subsequent four years (see Table 12, column 3). Among children younger than ten, males and children with allegations in the year following the sample incident had the highest odds ratios for the estimate of subsequent adjudication. The same characteristics, in addition to living in a household with a developmentally disabled child had the greatest odds ratios among children ten to fourteen. Having been placed as part of the sample investigation had significantly lower odds of a future adjudication for children ten to fourteen but not children younger than ten.

Table 12						
Logistic Regression Results for Subsequent Juvenile Delinquency Adjudication						
Case Characteristics	All Children		Children Age Nine or Younger		Children Age Ten or Older	
	B	Odds Ratio (confidence interval)	B	Odds Ratio (confidence interval)	B	Odds Ratio (confidence interval)
Male	0.886	2.425 (1.965-2.993)	1.255	3.509 (1.767-6.968)	0.893	2.441 (1.950-3.056)
Child age ten or older	2.027	7.591 (5.571-10.343)				
Age of child			0.912	2.489 (1.635-3.789)	0.139	1.149 (1.062-1.243)
Placed as a result of sample investigation					-0.516	0.597 (0.359-0.994)
One or more developmentally disabled children in home	0.925	2.522 (1.941-3.277)			0.851	2.342 (1.772-3.097)
Primary caretaker has a prior arrest record	0.322	1.379 (1.045-1.820)			0.444	1.559 (1.159-2.097)
Household has a prior PS investigation			0.802	2.229 (1.094-4.541)		
Child involved in another PS investigation in the year following the current incident	0.823	2.277 (1.848-2.805)	1.101	3.006 (1.536-5.883)	0.828	2.288 (1.831-2.858)
Constant	-5.217		-13.612		-4.801	
Chi Square (df)	471.678		65.684 (10)		197.437 (10)	
-2 Log Likelihood	2739.818		414.435		2277.356	
% Classified Correct	92.4%		98.2%		88.0%	
Total Cases	6,031		2,648		3,383	

Additional involvement with PS after the 1999 sampled incident had a significant effect on the likelihood of a subsequent petition for a violent offense (see Table 13). Involvement in another PS investigation within the next year had the highest odds ratio among children ten and older (2.55), and the second highest among children less than ten (3.45).

Table 13

Logistic Regression Results for Subsequent Juvenile Delinquency Petition for a Violent Offense

Case Characteristics	All Children		Children Age Nine or Younger		Children Age Ten or Older	
	B	Odds Ratio (confidence interval)	B	Odds Ratio (confidence interval)	B	Odds Ratio (confidence interval)
Male	0.737	2.090 (1.596-2.738)	1.785	5.958 (2.038-317.418)	0.666	1.947 (1.463-2.589)
Child age ten or older	1.967	7.149 (4.755-10.749)				
Age of child			1.238	3.448 (1.837-6.471)		
One or more developmentally disabled children in home	0.576	1.779 (1.261-2.511)			0.497	1.643 (1.140-2.368)
Primary caretaker has a prior arrest record	0.466	1.594 (1.127-2.254)			0.474	1.606 (1.106-2.334)
Child involved in another PS investigation in the year following the current incident	0.941	2.564 (1.950-3.370)	1.238	3.450 (1.391-8.555)	0.937	2.551 (1.910-3.407)
Constant	-5.748		-17.322		-4.830	
Chi Square (df)	252.884 (10)		51.905 (10)		96.811 (10)	
-2 Log Likelihood	1834.488		249.448		1552.281	
% Classified Correct	95.8%		99.0%		93.4%	
Total Cases	6,031		2,648		3,383	

SUMMARY

Review of Findings

The purpose of this study was to determine the number and characteristics of children involved in a PS investigation that were subsequently referred to JJS. The sample consisted of children age seven through fourteen involved in a PS investigation of child maltreatment allegations during 1999. Approximately one-sixth (13.9%) of these children were referred to JJS in the standardized four-year follow-up period. Children ten or older had much higher delinquency rates than did children nine or under. Twenty percent (20.6%) of children older than nine were referred and 13.4% were petitioned, while 5.5% of children of age seven to nine were referred and 2.3% petitioned. A greater proportion of males became delinquent compared to females (17.3% vs. 10.9% referred, respectively, and 11.5% vs. 5.8% petitioned). More risk factors than safety factors were correlated with subsequent delinquency. The household characteristics with a strong relationship to subsequent delinquency included caretaker substance abuse, prior arrest of a caretaker, sharing a household with a developmentally disabled child or a child with a mental health concern, and multiple PS investigations.

After controlling for child and family characteristics, older children and males still had the greatest odds of subsequent delinquency when delinquency outcomes were estimated using logistic regression. Outside of demographic characteristics, repeated involvement with PS appears to have the greatest impact. Additional PS allegations in the year following the sample incident increased the odds of delinquency significantly in every estimate, and a household's history of PS involvement was significant in at least one of the age groups for every outcome. The odds ratios for additional PS allegations and prior allegations were larger in the estimates for children ten or younger than in estimates for older children, which suggests that repeated involvement with PS has an even greater impact on a seven- to nine-year-old children's likelihood of future delinquency.

Children age ten through fourteen had additional characteristics estimated to significantly affect delinquency outcomes. Children from households with one or more developmentally disabled children were significantly more likely to be delinquent across the outcomes estimated.¹⁹ Living with a child with a mental health issue also increased the likelihood of delinquency, though to a lesser degree. Primary caretakers with a substance abuse problem increased the odds of a subsequent petition or adjudication, as well as the likelihood of petition for a violent offense. The odds ratios for a caretaker's substance problem, while significant, tended to be lower than those of the previously mentioned characteristics. Another difference in estimates for children ten or older is that having been placed in foster care as a result of the sample incident significantly reduced the likelihood of a subsequent delinquency referral and adjudication.

Targeting Service Delivery

The family characteristics estimated to increase the likelihood of a child becoming delinquent are easily identifiable and therefore provide a means of targeting services. Since workers observe these characteristics and record them on the PS family risk assessment, decisions about preventive intervention can be made at that point. The findings suggest that prevention efforts focused on families with more than one PS investigation and/or with one or more developmentally disabled or emotionally disturbed children are more likely to be successful in reducing delinquent activity.

This research indicates that repeated involvement with PS significantly increases a child's likelihood of becoming delinquent. A logical conclusion of this finding is that reducing subsequent

¹⁹ Other studies found a similar relationship. Some longitudinal research suggests that reading difficulties increase the likelihood of behavior problems such as delinquency (Gellert and Elbro, 1999; Williams and McGee, 1994). Others support the hypothesis that this relationship is the result of underlying factors such as language difficulties, impulsiveness, and poor judgement (Gellert and Elbro, 1999; Fergusson and Lynskey, 1997; Waldie and Spreen, 1993). One cross-sectional study found evidence to suggest that the greater representation of learning disabled youth in the juvenile justice system was better explained by differences in how they were treated by the system (Zimmerman, et. al., 1981).

child maltreatment will reduce a child's likelihood of future delinquency. In effect, an agency effort to reduce child maltreatment after a PS investigation is a viable delinquency prevention strategy.

A more specific target for prevention efforts is families with children that require a level of care beyond the average needs of a child.²⁰ Estimates of the delinquency outcomes consistently showed that children in a household with a child that had a developmental disability or mental health concern were much more likely to become delinquent. This may have been the sampled child, a sibling, or another child in the home.²¹ If a child with the disability was not the sampled child, it is still reasonable that there is a relationship between one child's disability and another child's delinquent behavior. It may be that caring for children with these difficulties taxes a parent's ability to provide adequate care to other children, or that caretakers' time with other non-disabled children is more restricted.²² If this is the case, a lower level of supervision or compromised quality of care may increase the likelihood of subsequent delinquency.

Focusing prevention efforts on children in families with a history of PS involvement, and on households with developmentally disabled or children with mental health concerns may be the best approach to the reduction of child maltreatment and juvenile delinquency. In addition, successful

²⁰ Caring for children with disabilities often involves an increased level of care (Rogow and Hass, 1999; Tomison, 1996; Ammerman and Baladerian, 1993) and requires more supervision and/or structure (Kragthorpe, et. al., 1997; Ammerman and Patz, 1996). Children with learning disabilities and/or ADHD are more prone to mood swings and depression (Smith, 1995; Smith, 1991), and may also be aggressive and non-compliant (Ammerman, 1997; Tomison, 1996).

²¹ Which child had a disability was impossible to determine for a large proportion of cases because of the limited data available. Whether or not a child was developmentally disabled or emotionally disturbed are risk assessment factors. These factors were cross-tabulated with the number of children in the home. Of the 559 children in a household with a developmentally disabled child, 75 (13.4%) were the only child. Of the 805 children in a household with a child that had a mental health problem, 115 (14.3%) were the only child. Some child-based disability information was available for placed children, but placed children were a very small proportion of the sample.

²² Because caring for a child with a disability requires an increased level of parenting skill and patience, children with some type of disability are more likely to be abused and/or neglected than those who were not disabled (Sullivan and Knutson, 2000; Goldman et. al., 2003). Some research indicates that a disabled child's increased susceptibility to child abuse is less related to child characteristics and more related to parental responses to stress (Burrell, Thompson, and Sexton, 1994; Zirpoli, 1986). Parents of children with disabilities are more likely to suffer stress (Burrell, Thompson, and Sexton, 1994; Egan, 1983) and have a greater potential for child maltreatment (Ammerman, 1997; Tomison, 1996; Zirpoli, 1986). The increased stress may result from strained family resources (Huntington, 1988; Krents et. al., 1987) or an environment that exceeds a parent's capacity to be nurturing (Faran, Metzger and Sparling, 1986; Kazak and Marvin, 1984). Parents of disabled children may feel depressed, which may contribute to feelings of or the behaviors resulting from stress (Smith, 2002).

While many researchers give evidence that stress increases the likelihood of child maltreatment (Ammerman, 1997), Sobsey (1994) indicates a lack of support for this theory and states that most families with disabled children do not respond abusively to stress.

prevention efforts with these groups are likely to improve child well-being, given that negative internalized behaviors as well as negative externalized behaviors such as delinquency are more prevalent among maltreated children.

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APPENDIX

Additional Sample Characteristics

ADDITIONAL SAMPLE CHARACTERISTICS

Table A1 reports the prevalence of safety factors among the children investigated in 1999.

Table A1		
Distribution of Safety Factors		
Safety Factors	N	%
Caretaker Violent Behavior		
Not Indicated	5,788	92.7%
Indicated	459	7.3%
Caretaker Negative Toward Child		
Not Indicated	5,903	94.5%
Indicated	344	5.5%
Physical Harm		
Not Indicated	5,977	95.7%
Indicated	270	4.3%
Explanation Unconvincing		
Not Indicated	6,162	98.6%
Indicated	85	1.4%
Family Refuses Access to Child		
Not Indicated	6,177	98.9%
Indicated	70	1.1%
Inadequate Supervision		
Not Indicated	5,686	91.0%
Indicated	561	9.0%
Unable to Meet Child Needs		
Not Indicated	5,904	94.5%
Indicated	343	5.5%
Previous Child Maltreatment		
Not Indicated	6,088	97.5%
Indicated	159	2.5%

Table A1		
Distribution of Safety Factors		
Safety Factors	N	%
Child Fearful		
Not Indicated	5,775	92.4%
Indicated	472	7.6%
Physical Conditions Hazardous		
Not Indicated	6,097	97.6%
Indicated	150	2.4%
Sexual Abuse Suspected		
Not Indicated	6,070	97.2%
Indicated	177	2.8%
Current Substance Issues		
Not Indicated	5,821	93.2%
Indicated	426	6.8%
Caretaker Health Concerns		
Not Indicated	5,982	95.8%
Indicated	265	4.2%
Other		
Not Indicated	5,951	95.3%
Indicated	296	4.7%
Total	6,247	100.0%

*Note: Twelve cases were missing a safety assessment.

Tables A2 and A3 show the frequency of each risk factor indicated by workers during the 1999 investigations.

Table A2		
Distribution of Neglect Risk Factors		
Neglect Risk Factors	N	%
Current Compliant is for Neglect		
No	1,729	27.7%
Yes	4,515	72.3%
Number of Prior Investigations		
None	2,959	47.4%
One	1,469	23.5%
Two or more	1,816	29.1%
Number of Children in the Home		
One	910	14.6%
Two	1,907	30.5%
Three or more	3,427	54.9%
Number of Adults in the Household		
Two or more	3,833	61.4%
One	2,411	38.6%
Household Has Previously Received Child Protective Services (voluntary or involuntary)		
No	4,912	78.7%
Yes	1,332	21.3%
One or More Children in Household Has a Medical Problem		
No	6,106	97.8%
Yes	138	2.2%
One or More Children in Household Has a Mental Health Problem		
No	5,439	87.1%
Yes	805	12.9%
One or More Children in Household Has a Developmental Disability		
No	5,567	89.2%
Yes	677	10.8%

Table A2		
Distribution of Neglect Risk Factors		
Neglect Risk Factors	N	%
Problematic Adult Relationships in the Household		
No	4,831	77.4%
Yes, problematic adult relationships/multiple live in partners	733	11.7%
Yes, household has a domestic violence history	680	10.9%
Primary Caretaker Has a History of Alcohol or Drug Abuse		
No	4,996	80.0%
Alcohol or non-addictive drug	934	14.9%
Addictive drug (cocaine, heroin, amphetamines, etc.)	314	5.0%
Primary Caretaker Has a Prior Arrest Record Disclosed During the Investigation		
No	5,222	83.6%
Yes	1,022	16.4%
Primary Caretaker Has a History of Abuse or Neglect as a Child		
No	5,528	88.5%
Yes	716	11.5%
Caretaker(s)' Response to Investigation		
No	5,713	91.5%
Yes	531	8.5%
Primary or Secondary Caretaker Has an Impulse Control Problem		
No	5,393	86.4%
Yes	851	13.6%
Total	6,244	100.0%

*Note: Fifteen cases are missing risk assessments.

Table A3		
Distribution of Abuse Risk Factors		
Abuse Risk Factors	N	%
Prior Allegation of Sexual Abuse		
No	5,735	91.8%
Yes	509	8.2%
Number of Prior Investigations		
None	3,069	49.2%
One	1,424	22.8%
Two or more	1,751	28.0%
Household Has Previously Received Child Protective Services (voluntary/legal/protective case)		
No	4,962	79.5%
Yes	1,249	20.0%
Three or more	33	0.5%
Number of Children in the Household		
One	933	14.9%
Two	1,929	30.9%
Three or more	3,382	54.2%
Primary Caretaker Has History of Abuse or Neglect as a Child		
No	5,542	88.8%
Yes	647	10.4%
Two or more	55	0.9%
Primary Caretaker Has a History of Alcohol or Drug Abuse		
No	4,879	78.1%
Alcohol or non-addictive drug	1,027	16.4%
Addictive drug (cocaine, heroin, amphetamines, etc.)	338	5.4%
Age of Youngest Child		
15 or older	99	1.6%
6 to 14	3,957	63.4%
5 or younger	2,188	35.0%

Table A3		
Distribution of Abuse Risk Factors		
Abuse Risk Factors	N	%
Problematic Adult Relationships in the Household		
No	4,824	77.3%
Yes, problematic adult relationships/multiple live-in partners	738	11.8%
Yes, household has a domestic violence history	682	10.9%
Either Caretaker Provides Inadequate Emotional Support		
No	5,800	92.9%
Yes	444	7.2%
Either Caretaker Injured a Child in Current or Previous Incident		
No	5,756	92.2%
Yes	488	7.8%
Either Caretaker Domineering Parent		
No	5,863	93.9%
Yes	381	6.1%
One or More Children Has a Mental Health Problem		
No	5,485	87.8%
Yes	759	12.2%
One or More Children Has a Delinquency History		
No	5,352	85.7%
Yes	892	14.3%
One or More Children has a Developmental Disability		
No	5,685	91.0%
Yes	559	9.0%
Caretaker(s)' Response to Investigation		
Caretaker cooperated with investigators	5,759	92.2%
Caretaker did not cooperate with investigators	485	7.8%
Total	6,244	100.0%

Table A4 reviews subsequent delinquency referral as a juvenile by the presence of each safety factor indicated at the time of the sampled investigation.²³

Table A4			
Presence of Safety Factors by Subsequent Juvenile Delinquency Referral			
Safety Factors	Total N	Subsequent Delinquency Referral	
		N	%
Caretaker Violent Behavior			
Not indicated	5,788	810	14.0%
Indicated	459	63	13.7%
Caretaker Negative Toward Child			
Not indicated	5,903	817	13.8%
Indicated	344	56	16.3%
Physical Harm			
Not indicated	5,977	826	13.8%
Indicated	270	47	17.4%
Explanation Unconvincing			
Not indicated	6,162	864	14.0%
Indicated	85	9	10.6%
Family Refuses Access to Child			
Not indicated	6,177	861	13.9%
Indicated	70	12	17.1%
Inadequate Supervision			
Not indicated	5,686	801	14.1%
Indicated	561	72	12.8%
Unable to Meet Child Needs			
Not indicated	5,904	832	14.1%
Indicated	343	41	12.0%

²³ A safety assessment was not available electronically for 12 children.

Table A4			
Presence of Safety Factors by Subsequent Juvenile Delinquency Referral			
Safety Factors	Total N	Subsequent Delinquency Referral	
		N	%
Previous child Maltreatment			
Not indicated	6,088	853	14.0%
Indicated	159	20	12.6%
Child Fearful			
Not indicated	5,775	798	13.8%
Indicated	472	75	15.9%
Physical Conditions Hazardous			
Not indicated	6,097	853	14.0%
Indicated	150	20	13.3%
Sexual Abuse Suspected			
Not indicated	6,070	855	14.1%
Indicated	177	18	10.2%
Current Substance Issues			
Not indicated	5,821	810	13.9%
Indicated	426	63	14.8%
Caretaker Health Concerns			
Not indicated	5,982	844	14.1%
Indicated	265	29	10.9%
Other			
Not indicated	5,951	827	13.9%
Indicated	296	46	15.5%
Total Sample	6,247	873	14.0%