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DEMOGRAPHIC RESEARCH AND CHILD ABUSE

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Demographic Research and Child Abuse

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This paper reports findings from nationally representative data concerning children who have already been harmed by abuse or neglect. Multiple-factor logistic models were developed to identify the risk factors for the occurrence of abuse or neglect as well as the factors that predict whether abused or neglected children will receive the attention of child protective services (CPS). Key findings were (1) that children in families with incomes under $15,000 per year were at far greater risk in every category of maltreatment; (2) that older children were generally at greater risk in every category of maltreatment; (3) that risk was also related to family structure, family size, child's sex and race/ethnicity, and metropolitan status of residential area, but that these relationships only applied to certain types of abuse or neglect or took different forms for different types of maltreatment; and (4) that interactions among risk factors were the rule, rather than the exception. The analyses concerning predictors of CPS attention revealed certain subgroups who were especially vulnerable because although they were at higher risk in the first place they were actually less likely to have their maltreatment investigated by CPS. This problem was evident for physically neglected low income children, physically abused children in two parent households, and physically or sexually abused minority adolescents and teenagers. Mandated reporters in public schools recognized the large majority of abused and neglected children who had not received CPS attention. The study findings indicated the need to better coordinate services across different systems especially between human services and economic services, and between child protection and education. They also implied that the state of the art in risk assessment would be appreciably advanced by the development beyond simple matrix approaches for risk assessment toward more interactive risk assessment models.

This report summarizes findings from recent reanalyses of the data from the second National Incidence Study of Child Abuse and Neglect, also called the NIS-2. Both the first and the second National Incidence studies on child abuse and neglect were conducted in order to go beyond cases of child maltreatment that come to the attention of the official Child Protective Services (CPS) system and attempt to assess the overall national incidence of the problem of child maltreatment. The NIS-1 was conducted in 1980; the NIS-2 data were collected in 1986 and the first findings were published in 1988. The NIS-3 is currently underway, to provide a national estimate of the number of abused or neglected children in 1993. Further information about these studies and their findings is available in a variety of technical reports and papers (Department of Health and Human Services, 1988; Sedlak, 1988, 1989, 1990, 1991a, 1991b, 1992; Sedlak & Alldredge, 1987; Sedlak, McFarland, & Rust, 1987).

The NIS methodology is based on the assumption that children who are officially reported to Child Protective Services (CPS) agencies represent only the "tip of the iceberg," and that there are considerable numbers of children who are recognized as abused or neglected by community professionals who are not investigated by CPS. For this reason, the NIS obtains data about abused and neglected children who come to the attention of CPS as well as about those who are recognized by community professionals in public schools, day care centers, short-stay general and children's hospitals, municipal police departments, social services/mental health agencies, the county juvenile probation and public health departments, and the county sheriff or state police. The NIS is designed to provide nationally representative estimates of the prevalence and distribution of all categories of abuse and neglect. The NIS applies standardized definitions of abuse and neglect and uses numbers of children as the unit of analysis. This report focuses on children who met the Harm Standard definitions of the NIS-2, by which a child was usually required to have already experienced demonstrable harm as a result of maltreatment in order to be countable.

Using the Harm Standard, the NIS-2 found that an estimated 931,000 children were abused or neglected in the U.S. in 1986. This was a significant increase over the estimate of 625,100 such children given by the NIS-1 in 1980.

Risk Factors for Abuse or Neglect. To the extent that the NIS-2 provides a nationally-representative sample of maltreated children, the risk factors identified in this database should be broadly generalizable. By comparing the characteristics of these children to the characteristics of other, non-maltreated children in the general population, it was possible to identify the important features that distinguished maltreated from non-maltreated children. Specifically, the nationally representative sample of 2,235 children in the NIS-2 who had been harmed by abuse or neglect were combined with a

comparison database of 3,798 nationally representative nonmaltreated children obtained in the U.S. Bureau of Census Current Population Surveys done in March 1986 and March 1987. Logistic models were developed in order to identify the factors that predicted the occurrence of Harm Standard maltreatment. The early analyses revealed strong differences across the different maltreatment types in terms of the factors that systematically related to risk, so separate logistic analyses were done for the six different categories of maltreatment identified in the column headings in Table 1. Notice that the first five categories (physical abuse, sexual abuse, physical neglect, emotional maltreatment, and multiple maltreatment) included children who had experienced the specific type of maltreatment in question, either *alone* or *only in conjunction with educational neglect.* The final category of children are those who were *only* countable as educationally neglected.

To maximize the likelihood that respondents will submit information to the study, the NIS data forms are kept fairly short, so the NIS provides very limited information about the children and families. The forms ask only about a few key demographic features and primarily focus on getting the information needed for deciding on the child's countability under the study definitions. Because of these limitations, it was only possible to examine the predictive strength of seven demographic factors: child's age, race/ethnicity, sex, family income, family structure, family size (i.e., number of children in the household), and county metrostatus.

Table 1 summarizes the findings on risk factors for abuse or neglect that fits the Harm Standard. All seven characteristics that were examined were found to relate to risk of abuse or neglect in some way, but the specific factors that predicted risk and the nature of their relation to risk depended on the type of maltreatment at issue and often on the circumstances of other important predictive factors as well.

Perhaps the most notable feature of this table is that *family income i*s the only factor that was consistently related to risk of all the categories of abuse and neglect. Compared to children whose families had incomes of $30,000 per year or more, children from families with incomes below $15,000 per year were found to have:

- 21 times greater risk of physical abuse,
- more than 24 times greater risk of sexual abuse,
- between 20 and 162 times greater risk of physical neglect,
- more than 13 times greater risk of emotional maltreatment,
- 16 times greater risk of multiple maltreatment, and
- between 78 and 97 times greater risk of educational neglect.

Despite the fact that the NIS forms gather only very rudimentary information about family income, and despite the fact that 20 percent of the cases had missing data on this item (since the participants did not always have enough information to feel confident about answering it), family income emerged as important in every analysis that was conducted concerning children's risk of experiencing maltreatment. It is theoretically possible that these findings derive from biases in the information provided by the NIS-2 sentinels, either because of their differential contacts with lower income families or because of their stereotypical beliefs about the connection between income and child maltreatment. However, there are a several reasons why these remarkably strong effects of family income are unlikely to be simply and solely due to distortions of this sort. First, the majority of children recognized in the NIS-2 were encountered by sentinels who were likely to see children and families at all income levels, so in the first place it is difficult to discount these findings as deriving entirely from differential observation of lower income families.[1] Second, if these results were simply an artifact of differential observation of lower income families, then that would mean that there are really more than twice the number of maltreated children in the nation who have already experienced harm or injury from abuse or neglect than the numbers the NIS-2 data have indicated. That is, if children from middle and upper income families really experience abuse and neglect at the same rates as those from the lower income families, then there would have to be approximately *an additional 1,105,400 maltreated children* in middle and upper income families who have remained hidden to the NIS-2 observers. Although this is theoretically possible, it would appear to be rather unlikely. Third and finally, although it is reasonable to suppose that these findings express some degree of distortion from stereotypical biases by the NIS-2 sentinels concerning the relationship between maltreatment and income, the circumstances here probably minimized the extent to which stereotypes like this biased the findings. This is because the majority of children recognized by NIS-2 observers were encountered by sentinels in schools (teachers, school nurses, counsellors, etc.), who should have considerable familiarity with the children they submitted to the NIS. The operation of stereotypical biases is typically quite small when observers are familiar with the persons they are describing (Deaux, 1976). Thus, we have concluded that the income differences in risk of abuse and neglect that have emerged in the NIS-2 Reanalyses probably largely reflect real risk differences among children in the different income sectors of the population.

After family income, the child's age ranked a distant second in strength as predictive of risk of abuse and/or neglect. Age did play some role in connection with risk of all categories of maltreatment, and wherever age did influence risk of maltreatment, it was the older children who were at greater risk. However, it is important to recognize that age-related differences in risk were nearly always qualified in some way, such that they only appeared in specific subgroups or were stronger for some subsets of children than for others, as described in Table 1. The characteristics that defined the

subgroups who showed differential age patterns varied across the different maltreatment categories, but they included family structure, child's race/ethnicity, and child's sex.

Two of the characteristics that were examined, family structure and child's race/ethnicity, were found to be predictors of risk in nearly all categories of maltreatment, but the specific family structures and races/ethnicities whose risk was greater varied from one maltreatment to another. In addition, the effects that did emerge were often qualified by the child's age as well, meaning that they only appeared at certain ages, or were stronger in some age brackets than in others.

The remaining three factors, county metropolitan status, family size, and child's sex, had more delimited relationships to risk, serving as predictors in three or fewer of the six maltreatment categories studied. Nevertheless, all three showed very consistent patterns in the nature of their relationship to risk, with children in urban areas, only-children, and females at greater risk than their counterparts.

Also, note that some of the patterns of findings (including some cases where a factor was not associated with risk) only came about after the other important risk factors for the maltreatment category were taken into account statistically. So, for example, notice that across the bottom row of Table 1, the findings of lower risk for mother-only family structures, or in some cases for single parent family structure, only came out when we controlled for family income (i.e., took the effects of family income into account when we measured the effects of family structure). This means that, when the same resources are available to the family, children in mother-only households are less likely to be maltreated--less likely to be sexually abused and less likely to be physically neglected. Again, given the same resources, children in single-parent households (whether mother-only or father-only households) were less likely to be physically abused or educationally neglected. By the same token, the underlying effects of race given here were only revealed when we controlled for the other important factors in the column--most especially family income. The pattern of findings here again underscore the importance of low income as the principal risk factor for maltreatment. Prevention efforts that target other factors (e.g., single family households) can miss the mark if the factors they target are only spuriously related to abuse and neglect because they happen to be correlated with low income groups.

One of the most important advantages of the findings concerning predictors of risk for child abuse and neglect that are presented here is their nationally-representative character, and hence their generalizability. Previous research on risk factors of child abuse and neglect was based largely on observations of nonrepresentative samples, which were identified only among the clientele who use different services (including CPS) and which typically had very limited geographical scope. In contrast,

these analyses provide nationally-representative estimates of the relationships between various characteristics and experiences of abuse and neglect.

We should also note that the multi-factor logistic models predicting risk of maltreatment accounted for only 8 to 20 percent of the variance in the occurrence of abuse and neglect (see Appendix). This probably stemmed from two sources. First, the models concerning the occurrence of maltreatment were attempting to account for a relatively rare event in comparison to the earlier models. It is inherently more difficult to account for substantial variance in occurrence when the event in question is very infrequent. Second, it is probably true that many other characteristics of children and their family circumstances are important determinants of the risk of abuse and neglect beyond the few demographic characteristics that could be examined in this study, which probably do not conform well to the underlying determinants of abuse and neglect.

Factors Related to the Likelihood of CPS Investigating Abuse or Neglect. The NIS data reflect all children who are recognized as abused or neglected by community professionals. The study methodology also indicates whether or not the abuse or neglect of a given child has been investigated by CPS. The NIS-2 showed that, overall, only 44 percent of the children who were already harmed by abuse or neglect had had their maltreatment investigated by CPS in 1986.[2] Logistic analyses were conducted to identify the characteristics of the children and families and the features of the maltreatment itself that predict the likelihood of CPS investigating a given child's abuse or neglect.

The factors that were found to predict CPS investigation of different categories of maltreated children are summarized in Table 2.[3] Early-on in the course of the analyses, we discovered that the different maltreatment categories shown in this table followed distinctly different dynamics in relation to CPS (but physical neglect and emotional maltreatment followed very similar dynamics), so we decided to work with the categories you see here. Overall, CPS had investigated 57 percent of the physically abused children, 65 percent of the sexually abused children, 29 percent of children physically neglected or emotionally maltreated, and 10 percent of those who had only been educationally neglected.

Fifteen characteristics were considered in the analyses as possible predictors of CPS investigation, and thirteen of these were actually found to play some role in that capacity. Only the rural/urban character of the county and the perpetrator's sex failed to evidence any influence on the likelihood that CPS would investigate a situation of maltreatment. Again, it is evident that the specific nature of the relation of a characteristic to the likelihood of CPS investigation generally depended on the type of maltreatment at issue and was often qualified by interactions among the important predictors.

Perhaps the most important aspect of Table 2 is what is not in it. Although family income was a powerful predictor of the occurrence of abuse or neglect (see Table 1), in Table 2 it is evident that abused or neglected children from lower income families were *not* any more likely to be among those investigated by CPS--and this directly contradicts the popular belief that poorer families are simply more often reported to CPS. This held for all the maltreatment categories we examined. Also, although sex was related to the risk of experiencing sexual abuse (Table 2 shows that females are at significantly higher risk), once the sexual abuse had occurred, the child's gender not relate to the likelihood of a CPS investigation (i.e., sexually abused girls were no more likely to be investigated by CPS than were sexually abused boys).

The prevailing message appears to be that the factors that predict whether or not CPS knows about a maltreated child are complex--no one factor holds across the board, and those that do have an impact often work in concert with one another, modifying and qualifying each other's effects. For example, one would expect to see that CPS awareness systematically relates to severity of harm--and we do see that here. However, for physical neglect and emotional maltreatment, the direction of the effect is the opposite of what one would expect, and among children who were physically abused, the expected pattern holds only for females. Also notice that the effects of race depended on age in three of the four categories. Blacks were more likely than whites to have their maltreatment investigated by CPS but only below certain ages.

There are several aspects of this set of findings that are noteworthy. First, a comparison of Tables 1 and 2 regarding the factors they list in common reveals that in virtually no instance did a given factor have the same impact on both the risk of occurrence of abuse and neglect and on the likelihood of CPS investigating maltreatment. Moreover, in some specific instances, a given factor actually yields opposite predictions in the two contexts--and this signals special vulnerabilities for some subgroups of children. The most evident example of this involves family income. As emphasized above, children in low income families (those with incomes below $15,000 per year) were especially likely to experience abuse or neglect. In addition, however, Table 5-2 indicates that children from low income families are in double jeopardy at least in one category of maltreatment -- they are not only more likely to experience physical neglect and/or emotional neglect than other children, they are also less likely to have this maltreatment investigated by CPS. A similar "double whammy" effect occurs for children in two-parent households in connection with physical abuse. Children who live with both parents were found to be at greater risk of experiencing physical abuse when their other characteristics were taken into account, but they were actually less likely to have their physical abuse investigated by CPS, as summarized in Table 2.

Who Encounters and Recognizes Uninvestigated Maltreatment. Figure 1 subdivides the maltreated children in the NIS-2 who had already been harmed based on the agency of the community professional who recognized the child as maltreated. Children are categorized here in the first group that applies to them, going from top to bottom in the figure. Thus, the totals shown in the figure as having been recognized by medical services staff (hospitals and public health departments) actually reflect additional children identified by these medical services staff, over and above those who had been recognized by law enforcement personnel (in juvenile probation departments, police agencies, or sheriff's departments). Note that this means that, except for law enforcement (the highest priority agency category), the estimates for numbers of children recognized by agencies in the other categories should be regarded as minimum, not total, estimates.

The most striking feature of this figure is the overwhelming predominance of public schools. Sentinels in public schools (teachers, nurses, and counselors) recognized more than half (54%) of all maltreated children who were countable under the Harm Standard. However, the figure also indicates that CPS had investigated the maltreatment of only about one-fourth of these children (26%). Taken together, these facts mean that a large sector of the uninvestigated countable children are known to sentinels in public schools. In fact, nearly three-fourths (72%) of the uninvestigated children were recognized by sentinels in public schools. School personnel recognized 49 percent of uninvestigated sexually abused children, 59 percent of uninvestigated children who had been physically harmed by physical abuse or neglect, and 81 percent of uninvestigated children who had been emotionally harmed by physical or emotional abuse or neglect. Clearly, substantial impact on the overall rates of CPS investigation could be made simply by targeting children who are recognized by school staff. In fact, if all countable children recognized at schools were to receive CPS investigation, then even if there were no other improvements in CPS investigation rates, the overall rate would increase from 44 percent to 84 percent.

Implications. The strength of family income as a risk factor for all categories of abuse and neglect suggests that the separation of economic services and human services may be a bureaucratic fiction that is not in the best interests of the children who are at risk of abuse or neglect. Exploration of methods by which economic and human services can be coordinated and better integrated with each other would be useful. When a family is reported for abuse or neglect and found to have an income dramatically below that needed for adequate functioning, then their treatment plan needs to explicitly include strategies geared toward enhancing their economic resources. Special demonstration projects could be funded to assess the relative workability and effectiveness of different approaches in this regard. These conclusions are consistent with the recent report of the U.S. Advisory Board on Child Abuse and Neglect, in which they recommended that the federal government take measures to insure "the

development of linkages with other service providers and community resources to ensure that children and families are receiving coordinated, integrated services."[4]

The need for more effective coordination between child protective services and the education system was also evident here, and it too was emphasized among the recommendations of the U.S. Advisory Board on Child Abuse and Neglect (1991).[5] School personnel are important sources of recognition of countable abused and neglected children, and particularly of the sector who are not investigated by CPS agencies. A substantially larger proportion of countable abused and neglected children would be investigated by CPS if better linkages could be forged between CPS agencies and the local community schools.

Some aspects of these findings suggest that other linkages between different sectors of the service system have also been neglected. Adolescents were found to be at greater risk of abuse or neglect than younger children, yet the older children were generally less likely to be investigated by CPS, particularly among males and among minorities. To the extent that CPS differentially fails to adequately serve certain sectors of adolescent youth, such as males and minorities (as found here), then CPS policies and priorities may be partially responsible for their disproportionate representation in these other populations of troubled youth. Special attention should be given to examining the extent to which existing policies and priorities in child protective services may inadvertently enlarge the scope of other problems, such as to the sizes of the runaway, delinquent, and even criminal youth populations.

Finally, the findings of the logistic analyses indicate the presence of a substantial number of interactions among important predictors, regardless of the outcome being examined. In fact, such effects emerged in all categories where analyses explicitly tested for their presence. The implication of this is that simplistic, single-factor approaches to predicting occurrence of abuse or neglect or the likelihood of CPS investigation will necessarily be incorrect, because they will fail to address the complexity of these events and their multiple determinants and modifiers. To be effective, policies and programs will need to explicitly acknowledge this complexity by taking multiple factors into account simultaneously rather than focusing on single issues or factors individually, and administrators and policymakers will need to build mechanisms for obtaining the multi-factor information base they will require to adequately design and monitor these more complex policies and programs.

Footnotes

[1]Schools account for more than half the abused and neglected children identified in the NIS, and the population of children who are in public school is well-representative of the broad spectrum of income levels. Approximately 90 percent of the U.S. population of school-age children attend public schools (National Center for Education Statistics, 1988). Moreover, not all children who attend private school should be assumed to live in higher income families. Between two-thirds and three-fourths of them attend Catholic schools, which often provide sliding-scale tuition fees to accomodate children from lower-income families.

[2]The implications of this are somewhat ambiguous because of the limitations of the NIS methodology. That is, the NIS does not indicate whether a child was not investigated by CPS because no one reported the child or because CPS screened-out the child's case prior to investigation.

[3]Multiple maltreatment included only a relatively small set of the children, and these were set aside for the analyses reported here. This means that the categories given in the table should be regarded as mutually exclusive. Also, educational neglect was ignored when it occurred in combination with other maltreatment. Thus, physical abuse included physical abuse alone or in combination with educational neglect); sexual abuse consisted of sexual abuse with or without educational neglect, etc.

[4]Recommendation D-2, p. 71.

[5]"The Federal Government should take all necessary measures to ensure that the nation's elementary and secondary schools, both public and private, participate more effectively in the prevention, identification, and treatment of child abuse and neglect." Recommendation D-4a, p. 85.

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Table 1. Risk Factors for the Occurrence of Harm Standard Maltreatment.

	PHYSICAL ABUSE	SEXUAL ABUSE	EMOTIONAL MALTREAT-MENT	PHYSICAL NEGLECT	EDUCATIONAL NEGLECT-ONLY	MULTIPLE MALTREAT-MENT
Child's sex	No relationship	Females at greater risk	No relationship	Depends on age: females at greater risk at 15-17 years	No relationship	Females at greater risk
Child's age	Depends on race and family structure; older at greater risk especially Blacks and Hispanics and with both parents present	Depends on race and family structure; older at greater risk for Whites, Blacks, & Hispanics, (but not other minorities) and for children in father-only households	Older children at greater risk	Depends on sex and family structure; older at greater risk for females and in father-only families	Depends on family structure; older children at greater risk with both parents present	Depends on race; older at greater risk for Whites, Blacks, and Hispanics, not other minorities
Child's race	Depends on age; Blacks and Hispanics at greater risk as age progresses	Depends on age; Whites, Blacks & Hispanics at greater risk than Other Races at older ages	Other minorities at greater risk than Whites, Blacks, or Hispanics	Related to risk of maltreatment when other factors ignored; not relevant when other important factors in this column are taken into account	Whites and Blacks at greater risk than Hispanics and other minorities	Depends on age; Whites at greater risk than other race/ethnicities at older ages
Family income	Higher risk in lower income families	Higher risk in lower income families	Higher risk in lower income families	Higher risk in lower income families	Higher risk in lower income families	Higher risk in lower income families
County Metrostatus	No relationship	No relationship	No relationship	Higher risk in very large urban counties (pop 1 million +)	Higher risk in urban than in rural counties	Higher risk in urban than in rural counties
Number of Children in HH	Higher risk with only one child in household	No relationship	Related to risk of maltreatment when other factors ignored; not relevant when other important factors in this column are taken into account	Related to risk of maltreatment when other factors ignored; not relevant when other important factors in this column are taken into account	Higher risk with only one child in household	No relationship
Family Structure	Depends on age; two parent families at greater risk above 5 years of age	Depends on age; father-only families at greater risk at older ages	No relationship	Depends on age; 15-17 yr olds at greater risk in father-only families	Depends on age; both parent families at greater risk at older ages	Both parent and mother-only families at greater risk than father-only families

Table 2. Factors Associated with Likelihood that CPS Will Investigate Harm Standard Children.[a]

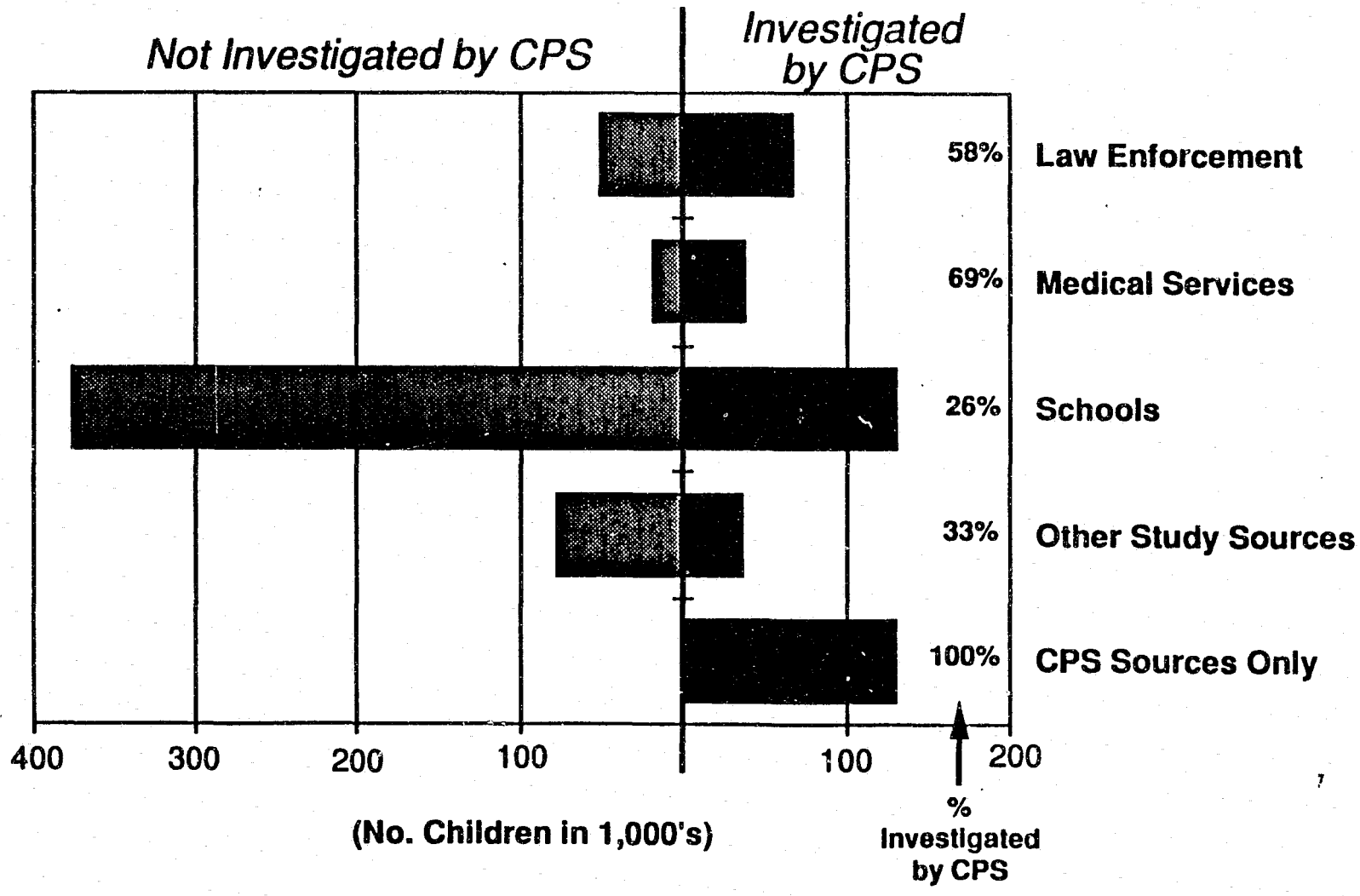
	PHYSICAL ABUSE	SEXUAL ABUSE	PHYSICAL NEGLECT & EMOTIONAL MALTREATMENT	EDUCATIONAL NEGLECT-ONLY
Child's sex	Depends on both age & severity of harm: Females more likely than males with fatal, serious, or inferred injuries, but not different with moderate injuries; females more likely than males at highest ages.	No relationship	Depends on age: males more likely below age 6, females more likely above age 6.	Related to CPS investigation when other factors are ignored; not relevant when other factors identified as important in this column are taken into account.
Child's age	Depends on race and sex: Blacks less likely with increasing age; weaker or no age difference for others; males less likely with increasing age but not so for females.	Depends on Race: likelihood increases w/age for Whites, decreases w/age for Blacks & Hispanics	Depends on sex: males less likely with increasing age; no age effect for females.	Depends on Race, Other Victims, & Family Structure: with increasing age, Whites more likely & Nonwhites less likely; less likely with age in both-parent and father-only families, more likely with age when other victims are also suspected.
Child's race	Depends on age: Blacks more likely below 12.5 yrs., Blacks less likely than above 12.5 yrs.	Depends on Age: Blacks & Hispanics more likely than Whites below age 7(Hispanics) and 8 (Black) but less likely at older ages	Hispanics and other minorities less likely than Whites and Blacks	Depends on age: Nonwhites more likely below age 14; Whites more likely at older ages
Number of Children	More likely for unknown number of children in household	No relationship	Related to CPS investigation when other factors are ignored; not relevant when other factors identified as important in this column are taken into account.	More likely when only one child in household
Family Structure	More likely for children in father-only families	No relationship	Related to CPS investigation when other factors are ignored; not relevant when other factors identified as important in this column are taken into account.	Depends on age: Less likely under age 16 in mother-only families
Family Income	No relationship	Related to CPS investigation when other factors are ignored; not relevant when other factors identified as important in this column are taken into account.	More likely when family has income more than $15,000 per year	Related to CPS investigation when other factors are ignored; not relevant when other factors identified as important in this column are taken into account.

Table 2. (continued)

	PHYSICAL ABUSE	SEXUAL ABUSE	PHYSICAL NEGLECT & EMOTIONAL MALTREATMENT	EDUCATIONAL NEGLECT-ONLY
Recognition Source	Less likely if recognized by day care, social services, or mental health	No relationship	More likely if recognized by law enforcement or medical services; when recognized by day care, social services, or mental health, other victims have no effect.	Less likely if recognized by day care, social services, or mental health
Other Suspected Victims in household	More likely when there are other suspected victims	More likely when there are other suspected victims	More likely with other victims; but this effect does not appear for those recognized by day care, soc serv, or mental health	Depends on age: More likely with other victims above age 9.5
Nature of Harm	No relationship	No relationship	More likely with physical injury.	No relationship
Severity of Harm	Depends on sex: For females, more likely for fatal, serious, and inferred injuries; for males, no effect of severity of harm	Less likely if actual evidence of harm is not available	More likely for moderate and inferred harm	Related to CPS investigation when other factors are ignored; not relevant when other factors identified as important in this column are taken into account.
Perpetrator Relationship	No relationship	No relationship	More likely for parents & parent/substitutes	No relationship
Perpetrator Location	Related to CPS investigation when other factors are ignored; not relevant when other factors identified as important in this column are taken into account.	More likely if perpetrator is not in child's home	Related to CPS investigation when other factors are ignored; not relevant when other factors identified as important in this column are taken into account.	No relationship
Number of Perpetrators	No relationship	No relationship	Less likely if more than one perpetrator was involved	No relationship

[a] Two additional factors were also examined and found not to be associated with CPS awareness for any maltreatment category: County Metrostatus and Perpetrator Sex.

Figure 1. CPS Investigation of Harm Standard Children: by Sources



Appendix

Table A-1. Final, Multi-factor Logistic Model to Predict the Occurrence of Physical Abuse.[1]

Parameter	Parameter Estimate	t
Intercept	-5.23856	-21.43
Age categories	0.24421	4.09
Black or Hispanic	-0.37504	-1.11
Income $15,000-29,999	-0.75037	-4.22
Income $30,000+	-2.89336	-8.17
2 to 3 children	-0.37216	-2.79
4 or more children	-0.25048	-1.06
Single parents	0.31873	0.67
Black/Hispanic x Age	0.16690	1.96
Single parent x Age	-0.20806	-1.76
Model R^2 Value	0.0819	
Model F-value	22.579	** (p<.005)
Model df	9,13	

[1]This model was based on a sample N of 4,462 (combined NIS-2 and Census datasets), within which 664 children were maltreated according to the Harm Standard and 3,798 were not.

Table A-2. Final, Multi-factor Logistic Model to Predict the Occurrence of Sexual Abuse.[2]

Parameter	Parameter Estimate	t
Intercept	-6.76845	-12.17
Female	1.21550	2.72
Age categories	0.28048	2.99
"Other" races	1.11882	1.49
Income $15,000-29,999	-1.42888	-5.26
Income $30,000+	-3.28111	-6.83
Mother-only	-1.30187	-1.44
Father-only	-1.39673	-0.95
"Other" races x Age	-0.57852	-2.58
Mother-only x Age	0.13012	0.54
Father-only x Age	0.42413	1.13
Model R^2 Value	0.1195	
Model F-value	48.439	** (p<.005)
Model df	10,12	

[2]This model was based on a sample N of 4,244 (combined NIS-2 and Census datasets), within which 446 children were maltreated according to the Harm Standard and 3,798 were not.

Table A-3. Final, Multi-factor Logistic Model to Predict the Occurrence of Physical Neglect.[3]

Parameter	Parameter Estimate	t
Intercept	-4.14428	-13.18
3-8 year olds	-0.39700	-1.31
9-14 year olds	0.19562	0.50
15-17 year olds	0.83387	0.58
Income $15,000-29,999	-1.89876	-3.55
Income $30,000+	-5.24725	-6.83
Other MSA & NonMSA	-1.31109	-2.18
Mother-only	-0.01197	-0.04
Father-only	0.15599	0.30
Mother-only x 3-8 yr olds	-0.78401	-2.43
Mother-only x 9-14 yr olds	-1.12620	-2.94
Mother-only x 15-17 yr olds	-1.45642	-2.35
Father-only x 3-8 yr olds	1.54030	2.70
Father-only x 9-14 yr olds	0.42254	0.71
Father-only x 15-17 yr olds	0.85520	1.35
Females	-0.06718	-0.25
Females x 15-17 yr olds	1.32303	1.01
Model R^2 Value	0.202	
Model F-value	7.483	* (p<.025)
Model df	16,6	

[3]This model was based on a sample N of 4,228 (combined NIS-2 and Census datasets), within which 430 children were maltreated according to the Harm Standard and 3,798 were not.

Table A-4. Final, Multi-factor Logistic Model to Predict the Occurrence of Emotional Maltreatment.[4]

Parameter	Parameter Estimate	t
Intercept	-7.40889	-26.12
Age categories	0.53820	8.06
"Other" races	1.49757	3.39
Income $15,000-29,999	-1.02085	-4.23
Income $30,000+	-2.55762	-6.39
Model R2 Value	0.1201	
Model F-value	24.778	** (p<.005)
Model df	4,18	

Table A-5. Final, Multi-factor Logistic Model to Predict the Occurrence of Multiple Maltreatment.[5]

Parameter	Parameter Estimate	t
Intercept	-6.50494	-8.10
Females	0.61677	1.71
Age categories	0.29579	2.04
Blacks & Hispanics	-0.70775	-1.25
"Other" races	1.64811	2.19
Income $15,000-29,999	-1.41213	-3.34
Income $30,000+	-2.79076	-5.04
Other MSA & Non-MSA	-1.11120	-1.45
Father-only	-1.52179	-1.44
"Other" races x Age	-1.10573	-3.67
Model R^2 Value	0.0954	
Model F-value	9.623	** (p<.005)
Model df	9,13	

[4]This model was based on a sample N of 4,072 (combined NIS-2 and Census datasets), within which 274 children were maltreated according to the Harm Standard and 3,798 were not.
[5]This model was based on a sample N of 3,962 (combined NIS 2 and Census datasets), within which 164 children were maltreated according to the Harm Standard and 3,798 were not.

Table A-6. Final, Multi-factor Logistic Model to Predict the Likelihood of CPS Investigating Physically Abused Children.[6]

Parameter	Parameter Estimate	t	
Intercept	0.54694	0.45	
Females	1.02494	0.60	
Age in years	-0.09691	-1.58	
Other Victims	1.49131	2.13	
Day care, Mental Hlth, Soc.Serv.	-0.65325	-1.71	
Father-only	1.39672	1.44	
Moderate injury	0.27275	0.29	
Age x Females	0.09006	1.00	
Moderate injury x Females	-2.23485	-1.65	
Unknown no. of children	1.69043	1.53	
Blacks	1.81430	1.19	
Age x Blacks	-0.13587	-1.01	
Model R^2 Value	0.156		
Model F-value	4.658	** ($p<.01$)	
Model df	11,11		

[6]This model excludes children with unknown race/ethnicity and multiple maltreatment. It was based on a sample N of 566 cases, of which CPS had investigated 176 and had not investigated 390.

Table A-7. Final, Multi-factor Logistic Model to Predict the Likelihood of CPS Investigating Sexually Abused Children.[7]

Parameter	Parameter Estimate	t	
Intercept	-0.86616	-0.60	
Blacks	3.41557	1.57	
Hispanics	3.58584	1.08	
Age in years	0.10273	1.33	
Other Victims	2.64119	2.58	
Age x Blacks	-0.41414	-2.48	
Age x Hispanics	-0.54371	-1.94	
Inferred harm	-0.75907	-1.18	
Perpetrator out of home	1.21235	1.48	
Model R^2 Value	0.3379		
Model F-value	3.255	* ($p<.05$)	
Model df	8,14		

[7]This model excludes children with unknown race/ethnicity and multiple maltreatment. It was based on a sample N of 400 cases, of which CPS had investigated 95 and had not investigated 305.

Table A-8. Final, Multi-factor Logistic Model to Predict the Likelihood of CPS Investigating Physically Neglected and/or Emotionally Maltreated Children.[8]

Parameter	Parameter Estimate	t
Intercept	2.33891	1.97
Blacks & Hispanics	-0.74401	-2.03
Age in years	-0.14978	-1.56
Other Victims	1.21102	2.85
Schools	-2.52250	-3.90
Day care, Mental Hlth, Soc.Serv.	-1.30416	-1.79
Other Victims x Day care, Mental Hlth, Soc.Serv.	-1.51287	-1.11
Two or more perpetrators	-1.10077	-2.51
Non-parental perpetrators	-2.22199	-1.24
Moderate & Inferred injury	0.84510	1.50
Females	-0.87595	-1.09
Age x Females	0.14912	1.88
Income $15,000+	0.86772	1.70
Income Unknown	0.41281	1.02
Physical condition/impairment	-1.13349	-1.42
Moderate & Inferred injury	-1.45517	-1.50
Model R^2 Value	0.3324	
Model F-value	3.431	m ($p<.10$)
Model df	15,7	

[8] This model excludes children with unknown race/ethnicity and multiple maltreatment. It was based on a sample N of 638 cases, of which CPS had investigated 114 and had not investigated 524.

Table A-9. Final, Multi-factor Logistic Model to Predict the Likelihood of CPS Investigating Educationally Neglected Children.[9]

Parameter	Parameter Estimate	t
Intercept	1.05378	0.52
Nonwhites	5.82370	1.46
Age	-0.22908	-1.36
Other Victims	-4.51240	-1.28
Mother-only	-9.10670	-1.45
Day care, Soc. Serv., Mntl Hlth	-3.91944	-1.55
Age x Other Victims	0.49891	1.59
Age x Nonwhite	-0.41680	-1.48
Age x Mother-only	0.57862	1.25
2 to 3 children	-0.91805	-1.43
Model R^2 Value	0.3113	
Model F-value	0.848	n.s.
Model df	9,12	

[9] This model excludes children with unknown race/ethnicity. It was based on a sample N of 217 cases, of which CPS had investigated 32 and had not investigated 185.