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MALTREATMENT AND DISABILITIES: A POPULATION-BASED EPIDEMIOLOGICAL STUDY

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ABSTRACT

Objectives: To assess the prevalence of abuse and neglect among a population of children identified as a function of an existing disability, relate specific types of disabilities to specific types of abuse, and to determine the effect of abuse and neglect on academic achievement and attendance rates for children with and without disabilities.
Method: An electronic merger of school records with Central Registry, Foster Care Review Board, and police databases was followed by a detailed record review of the circumstances of maltreatment.
Results: Analyses of the circumstances of maltreatment and the presence of disabilities established a 9% prevalence rate of maltreatment for nondisabled children and a 31% prevalence rate for the disabled children. Thus, the study established a significant association between the presence of an educationally relevant disability and maltreatment.
Conclusions: Children with disabilities are 3.4 times more likely to be maltreated than nondisabled peers. School professionals need to be cognizant of the high base rate of maltreatment among the children they serve. Disability status needs to be considered in national incidence studies of maltreatment. © 2000 Elsevier Science Ltd.

Key Words—Child maltreatment, Disabilities, Risk factors.

INTRODUCTION

THE HYPOTHESIZED ASSOCIATION between disabilities and child maltreatment has been controversial for over a decade (c.f. Ammerman, 1991; Starr, Dietrich, Fischoff, Ceresnie, & Zweier, 1984). Not only has there been a paucity of research on the maltreatment of children with disabilities, state agencies charged with the responsibility of investigating or responding to maltreatment have long been unlikely to even note the presence of disabilities in their records. Indeed, Bonner, Crow, and Hensley (1997) indicated that only seven states currently record disability status in their abuse records, a decline from 1982 when Camblin reported fewer than half the states recorded disability status of maltreated children. Thus, although the Child Abuse Prevention, Adoption, and Family Services Act of 1988 (1988, April) (PL100-294) in the US mandated the study of maltreatment among children with disabilities, relatively little scholarly and

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practical attention has focused on the hypothesized association between disabilities and child maltreatment.

One recent attempt to explore the relation between maltreatment and disabilities used the methodology of the Second National Incidence Study (NIS-2; Office of Human Development Services, 1988) to determine the incidence of abuse among children with disabilities (Westat, Inc., 1993). Data were collected from 35 Child Protective Service (CPS) agencies selected to be nationally representative of US counties. The study concluded that the incidence of maltreatment among children with disabilities was estimated to be 1.7 times the incidence of children without disabilities. Additionally, based on the opinions of CPS workers, it was estimated that the disability either led to or contributed to the abuse in 47% of the cases, whereas in 37% of cases the abuse contributed to or resulted in a disability. Importantly, like Camblin (1982) and Bonner and colleagues (1997), the Westat, Inc. (1993) study reported that CPS agencies rarely recorded disability status in a systematic fashion.

Although the Westat, Inc. (1993) study provided support for the hypothesis that there is an association between disabilities and maltreatment, methodological limitations precluded strong inferences from that work. Most importantly, the Westat, Inc. (1993) study relied on the opinions of CPS workers to determine the presence or absence of disabilities, whether the disability played a role in the maltreatment, or whether the maltreatment caused a disability. Thus, analyses regarding disability were based on opinion rather than disability diagnosis established by physicians or other appropriate professionals trained to diagnose those disabilities. Finally, because of the reliance on CPS records, the study was largely limited to cases of intrafamilial abuse. That is, extrafamilial maltreatment is typically recorded in law enforcement records and law enforcement records are rarely represented in state CPS records (Flango et al., 1988). Consequently, extrafamilial maltreatment may not be accurately represented in the Westat, Inc. (1993) study.

Recently Sullivan and Knutson (1998) completed an epidemiological study designed to evaluate the hypothesized association between disabilities and maltreatment using a hospital-based sample that permitted diagnoses of disabilities from medical records. Additionally, because Sullivan and Knutson (1998) used CPS records, foster care records, and law enforcement records to obtain evidence of maltreatment, the study was not limited to intrafamilial maltreatment. Based on a sample of 3001 maltreated children and 880 comparison children, Sullivan and Knutson (1998) provided considerable evidence that disabilities were risk factors for maltreatment, as well as evidence that maltreatment could be important in the development of some disabilities, especially those related to conduct-disordered behavior.

Although the Sullivan and Knutson (1998) study provided strong support for the hypothesized link between disabilities and maltreatment, the use of a hospital-based sample could limit the generalizability of that research. That is, Coon, Beck, and Coon (1980) have argued that studies of maltreatment in hospital populations may over sample subjects with disabilities. As a result, the present study was designed to be a replication and extension of the Sullivan and Knutson (1998) research. By using an entire school-based population drawn from the same geographical region as the Sullivan and Knutson (1998) study, the present study avoided any subject selection bias. Additionally, by using a school-based disability criterion (i.e. educationally mandated disabilities), the study assured full inclusion of disabilities.

METHOD

Subjects

The subjects for this study were all 50,278 children enrolled in the Public (OPS) and Archdiocese schools of Omaha, Nebraska during the 1994–95 school year. In addition to the kindergarten

through 12th grade pupils, the population included children who were eligible to participate in various special education programs in OPS (e.g., Zero to Three, Early Intervention Preschool). Thus, the population ranged in age from 0 to 21. The population was 51.4% male and 48.6% female. The ethnic composition of the total school population was 66.9% Caucasian, 25.4% African American, 5.1% Hispanic, 1.3% Native American, and 1.1% Asian American or Pacific Islander. Although the school population accurately reflects the ethnic composition of the city, relative to 1995 US Census data, the study included approximately 21% fewer Caucasians, 4.7% fewer Hispanics, 2.2% fewer Asian Americans, and 17% more African Americans.

Procedure

The electronic database of the schools included the first three characters of a child's surname, their first name, middle initial, gender, and date of birth. These data were electronically merged with the Central Registry of the Nebraska Department of Social Services (NDSS; 46,699 records), the database of the Nebraska Foster Care Review Board (FCRB; 22,798 records), and the victimization records from the combined data archive of the Omaha Police Department and the Douglas County Sheriff's Office (12,614 records). The merged records identified 4,503 OPS students with records of maltreatment in one or more of the victimization databases and 35,708 pupils who were not identified as maltreated; 403 maltreated children were identified among the Archdiocese students, with 9,665 not identified as maltreated. Approximately half of the maltreated children were represented in more than one agency database. Thus, approximately 11% of the Omaha public school population and 4% of the parochial school population had archival evidence of maltreatment.

In addition to providing the data fields for the merging of records, OPS provided electronic information regarding race, disability status and educational placement, year long attendance data, and standardized test scores for the most recent administration of the Reading and Mathematics subtests of the California Achievement Test (CAT). The OPS central records also provided information regarding special education recipients enrolled in the Archdiocese schools. These electronic school records were used to assess academic progress of maltreated and nonmaltreated children and to identify maltreated and nonmaltreated children who had a disability. Comparable information from the Archdiocese Schools was not available in an electronic format. Moreover, the Archdiocese Schools data were not centralized. Prior to attempting to secure comparable data from individual records, a preliminary comparison between the Public and Archdiocese schools was completed with respect to the prevalence of maltreatment and the identification of educationally relevant disabilities. With respect to maltreatment, in the absence of co-occurring disabilities, 8% of the public school children had a record of maltreatment, whereas only 3.8% of the Archdiocese school children had such a record. Thus, the base rate of maltreatment among children enrolled in the public schools was more than twice that of the children in the Archdiocese schools. When disabilities were considered, the difference between schools was even more pronounced. While .7% of the parochial pupils who had not been maltreated were diagnosed with an educationally relevant disability, 5.6% of the OPS pupils had a disability diagnosis. Within the parochial schools .2% were identified with a record of a disability and maltreatment whereas 2.4% of the total OPS children had a record of a disability and maltreatment. In the context of the present research, when maltreatment and disabilities are considered in concert, the Archdiocese and Public schools from the same community were serving dramatically different populations. Because of the low base rate of maltreatment and disabilities in the parochial schools and the limited electronic records, the children enrolled in the Archdiocese schools were only used to establish overall prevalence rates of maltreatment among school-aged children in the community. All analyses of maltreatment and disabilities were based on the public school pupils.

The regulations and standards for special education programs mandated through the Nebraska

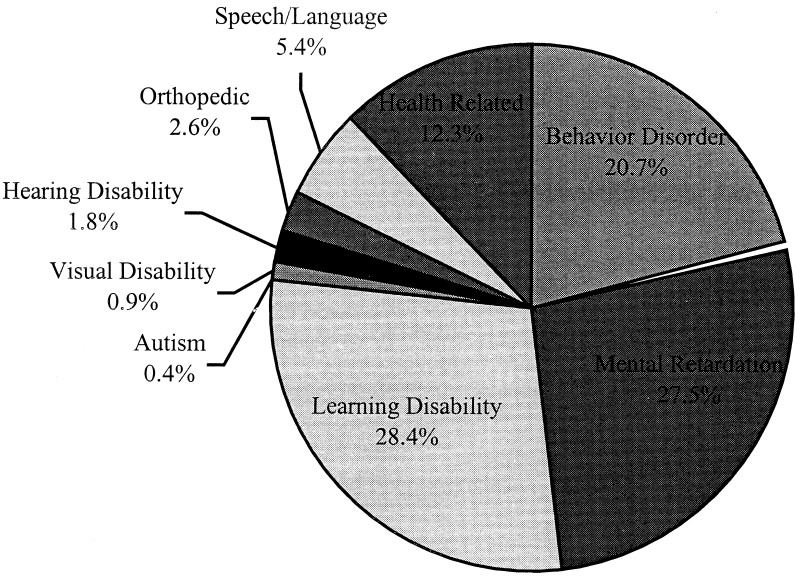

Figure 1. Percentage of disabilities in total populations.

Department of Education (Rule 51) were used to define disabilities. According to Rule 51, "Children with disabilities shall mean those children who have been verified by a multidisciplinary evaluation team as per 92 NAC 51-006 as children with autism, behavior disorders, deaf-blindness, hearing impairments, mental retardation, multiple disabilities, orthopedic impairments, other health impairments, traumatic brain injury or visual impairments, who because of these impairments need special education and related services." Thus, for each disability, a multidisciplinary team had determined that a child met the criteria for that disability and was eligible for special education services according to Nebraska and Federal (i.e., P.L. 94-142) statutes. Some 8% of the total school population had an identified disability. The types and prevalence of disabilities represented in the total population, including both the maltreated and nonmaltreated control groups, are shown in Figure 1.

For each child identified as maltreated in the data merger, a detailed record review was completed using the archival victimization records of NDSS, FCRB, and the law enforcement agencies, as well as the case-level records and event records of the investigating officers. Trained personnel recorded the age of the child when maltreatment was first reported to the agency and detailed information regarding the circumstances of up to six episodes of each form of abuse. Information recorded included: the types of abuse (consistent with the Interagency Task Force on Research Definitions of Maltreatment); a rating of the severity of maltreatment (see Barnett, Manley, & Cicchetti, 1991); perpetrator characteristics; site of abuse; marital status of parent; and, duration of maltreatment. In addition to abuse-specific information, a number of family attributes, many of which had been assessed in research on the effects of adverse environments on child development (e.g. Kelbanov, Brooks-Gunn, McCarton, & McCormick, 1998) were recorded. These attributes included a record of domestic violence in the child's family, the runaway status of the child, a parental history of maltreatment, parent employment status at the time of the maltreatment, parental history of incarceration, number of addresses for the family, and a number of family related stressors (e.g., family isolation, parental illness, sibling illness, disability of another family member, incarceration of a family member). To establish reliable record review and coding, 10% of the records were randomly sampled throughout the course of the study to assess intercoder

Table 1. Percentages of Maltreated and Nonmaltreated Children With and Without Disabilities

	Disabled *n* (%)	Nondisabled *n* (%)	Total *N* (%)
Maltreated	1,012 (31)	3,491 (9)	4,503 (11)
Nonmaltreated	2,250 (69)	33,458 (91)	35,708 (89)
Total	3,262 (100)	36,949 (100)	40,211 (100)

agreement. By sampling from records reviewed during all phases of the record abstracting process, the reliability assessment permitted the detection of coder drift (Taplin & Reid, 1973) as well as intercoder agreement. The correspondence between the original coding and the reliability check was assessed using the effective agreement statistic for occurrence. For all of the reliability checks, effective agreement statistics ranged from 85% to 100% with a mean of 93%. Cohen's Kappa and, where appropriate, the weighted Kappa statistics ranged from .74 to 1.0 with a mean of .85.

RESULTS

Table 1 shows the overall prevalence of disabilities among the maltreated and nonmaltreated children enrolled in the Omaha Public Schools. Although there was an overall rate of maltreatment of approximately 11% in the population, the overall rate of maltreatment among children who had an identified disability for which they were receiving special education services was 31%, a rate more than three times that of children without an educationally relevant disability. Stated another way, among the 4,503 maltreated children, 22% had a disability for which they received special education services, while only 6.7% of the nonmaltreated children enrolled in the school system had an identified disability. Thus, there was a strong association between some form of maltreatment and some disability [χ^2 (1, N = 40,211) = 1,375, $p < .001$]. Among the maltreated children, the following disability percentages were found: Behavior disorders (37.4%), mental retardation (25.3%), learning disabled (16.4%), health related (11.2%), speech/language (6.5%), physical/orthopedic disabilities (1.2%), hearing impairment (1.3%), visual impairment (.4%), and autism (.1%).

Figure 2 provides the percentage of each disability group found to have a record of child maltreatment. For all disabilities with the exception of autism, the prevalence rate of maltreatment significantly exceeded the 9% rate obtained for children without an educationally relevant disability [χ^2 (9, N = 40,211) = 2003.86, $p < .001$].

Due to the small numbers of children within some of the individual disabilities (i.e., autism and visual impairment), for some of the analyses, the disabled children were grouped into the following disability groups: Behavior (behavior disorders and autism); communication disorders (combined speech, language, hearing and learning disabilities); mental retardation (combined all degrees of mental retardation from mild to profound); and orthopedic and health related (combined visual impairment, orthopedic disabilities, and health related disabilities such as asthma and juvenile rheumatoid arthritis).

Table 2 shows the overall prevalence of type of maltreatment experienced by the total population. Three patterns are apparent in that table. First, neglect is clearly the most prevalent form of maltreatment for both disabled and nondisabled children. Secondly, most children endured multiple forms of maltreatment. Significantly more of the children with disabilities (63%) experienced multiple forms of maltreatment than nondisabled (54.9%) victims [χ^2 (1, N = 4,503) = 20.15, $p < .001$]. It should be noted that multiple forms of maltreatment could occur in a single episode or across multiple episodes. Children with disabilities were also more likely to endure multiple (71.0%) episodes of maltreatment than single (29.0%) episodes. This was significantly higher than

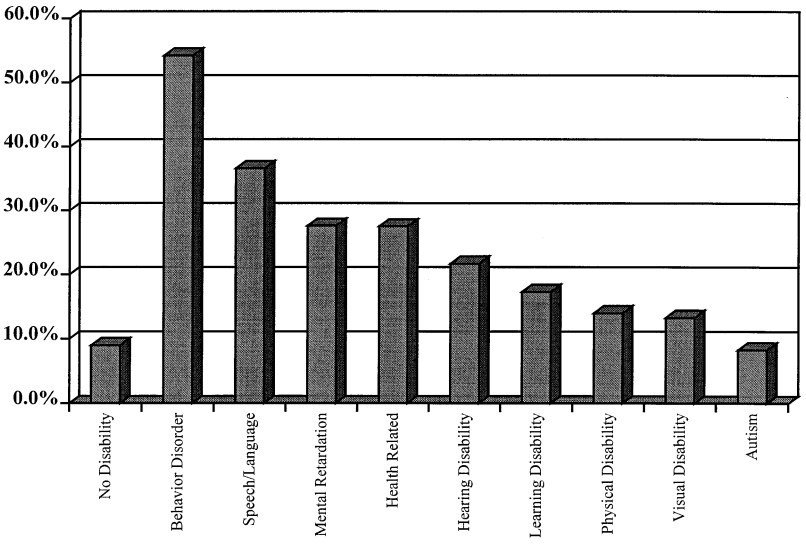

Figure 2. Prevalence of maltreatment by disability status.

nondisabled children even though they were also more likely to endure multiple (60.6%) episodes of maltreatment than single (39.4%) episodes [χ^2 (1, N = 4,503) = 34.88, $p < .001$]. Thus, children with disabilities tended to be maltreated multiple times and in multiple ways. In both the disabled and nondisabled groups, emotional abuse virtually never occurred in the absence of other forms of maltreatment. Third, there were no significant associations between type of disability and type of maltreatment. For each of the disability categories, neglect was clearly the predominate form of maltreatment, followed by physical abuse, emotional abuse, and sexual abuse, in descending order of prevalence for all disability groups. It should be noted there were 48 (13 disabled and 35 nondisabled) children for whom type of maltreatment was not recorded in the agency records.

Table 2. Maltreatment Type By Disability Type

	Disability Type					
Maltreatment Type	None	Behavior Disorder	Communication Disorder	Health/ Orthopedic	Mental Retardation	Totals
Neglect	765	96	52	29	54	996
Sexual	436	11	21	8	21	497
Physical	269	20	20	8	12	329
Emotional	19	1	1	2	1	24
Sexual/Physical	46	5	3	2	5	61
Physical/Neglect	336	42	30	12	28	448
Sexual/Emotional	17	0	1	0	0	18
Physical/Emotional	55	6	2	3	1	67
Sexual/Neglect	170	12	6	6	15	209
Emotional/Neglect	374	30	37	19	23	483
Sex/Phys/Emotional	3	3	0	0	0	6
Phys/Neg/Emotional	437	57	33	22	38	587
Sex/Neg/Emotional	94	15	6	4	10	129
Sex/Phys/Neglect	95	17	7	7	11	137
Sex/Phys/Emot/Neg.	183	41	17	3	29	273
Did Not Report	35	11	1	1	0	48
Totals	3334	367	237	126	248	4312

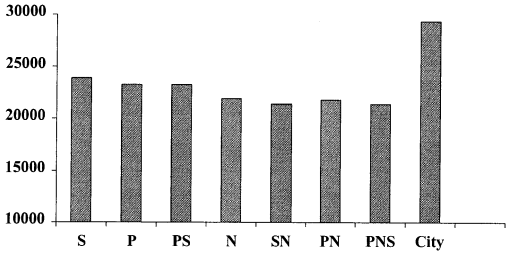

Figure 3. Median income of maltreatment groups.

Because existing research has implicated socioeconomic status in the identification of maltreatment, analyses were completed to determine whether the maltreatment groups differed socioeconomically. Based on the maltreated child's address of residence at the time of maltreatment and/or the school attendance center location, children were assigned a median income value based on the most recent US Census tract data. Thus, consistent with those who have advocated community and community resource-based assessments of socioeconomic status in child development (e.g., Duncan, Brooks-Gunn, & Klebanov, 1994) and maltreatment research (e.g., Coulton, Korbin, Su, & Chow, 1995; Drake & Pandey, 1996; Zuravin, 1991), the analysis of socioeconomic status was based on the socioeconomic status of the child's community of residence rather than the annual income of the child's family. As shown in Figure 3, a one-way ANOVA contrasting abuse groups indicated there were statistically reliable differences with respect to the socioeconomic status of their neighborhoods, F (106, 40,211) = 2.23, $p < .001$. With the median income of the city included for visual comparison only, Figure 3 provides a picture of increasing economic distress associated with multiple forms of maltreatment. The link between neglect and economic disadvantage is also apparent.

To assess the role of age in maltreatment, the children were grouped according to enrollment status during the 1994–95 school year as follows: Preschool (ages 0 through 5), Elementary (ages 6 through 9), Middle School (ages 10 through 13), and High School (ages 14 through 20). Age at first incident of maltreatment for the total sample, based on the combined records of the Central

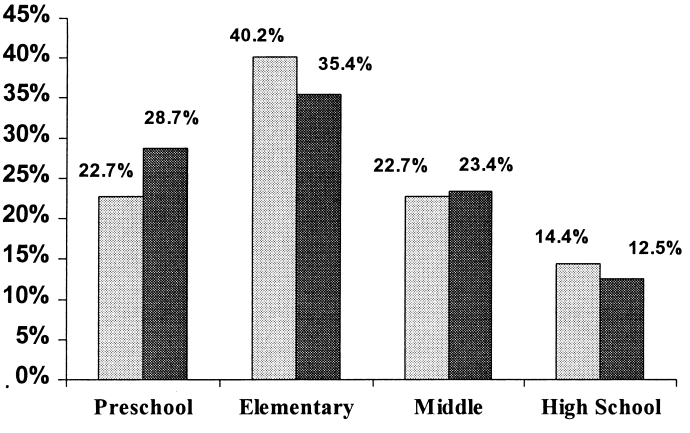

Figure 4. Age at First Incident of Maltreatment for Total Sample.
Non-Disabled
Disabled

Table 3. Age at First Maltreatment Incident for Disability Groups

	Age Grouping			
Disability Type	Pre-School (0–5)	Elementary (6–9)	Middle (10–13)	High School (14–20)
Behavior Disorder	22.6%	29.2%	31.3%	16.9%
Communication	44.3%	29.1%	19.8%	6.8%
Health/Orthopedic	63.5%	21.4%	7.1%	7.9%
Mental Retardation	31.5%	31.5%	23.4%	13.7%
None	30.9%	32.0%	22.7%	14.5%

F (4, 4,311) = [27.44, $p < .000$]

Registry, police agencies, and the FCRB is shown in Figure 4. For both the disabled and nondisabled victims of maltreatment, significantly more children were maltreated for the first time between the ages of 6 and 9 than during the pre, middle, or high school years [χ^2 (3, $N = 4{,}503$) = 9.64, $p = .022$].

Age at first incident of maltreatment was significantly related to disability group, F (4, 4,503) = 20.67, $p < .001$. Table 3 lists the percentages of each disability group with a first record of maltreatment during each of the four age groupings. Because no data regarding age at first diagnosis of the disability were available, it was impossible to determine whether the disabilities antedated the maltreatment. Nevertheless, there is suggestive evidence that age patterns of maltreatment vary across disabilities. Children with disabilities comprise around one-third of the maltreated children between the ages of birth to 9 years, almost one-fourth in the middle school years, and only around one-sixth in the high school years. Children with Health/Orthopedic and Communication disabilities have a preponderance of first incidents from birth to 5 years of age suggesting these disabilities are risks for maltreatment. In contrast, children with Behavior and Mental disabilities appear to incur maltreatment across the age ranges suggesting these disabilities are both risks and consequences of maltreatment.

Gender of the maltreated and nonmaltreated children with and without disabilities is shown in Figure 5. There were 2,255 males (50.1%) and 2,248 females (49.9%) in the maltreated group. Of those without an identified disability, 1,948 were female (55.8%) and 1,543 (44.2%) were male. In

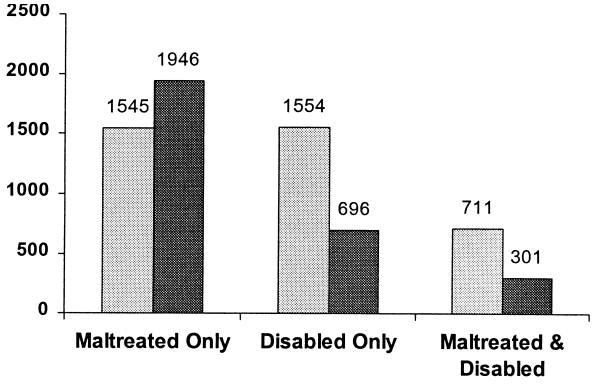

Figure 5. Gender, Disability, and Maltreatment.

Male
Female

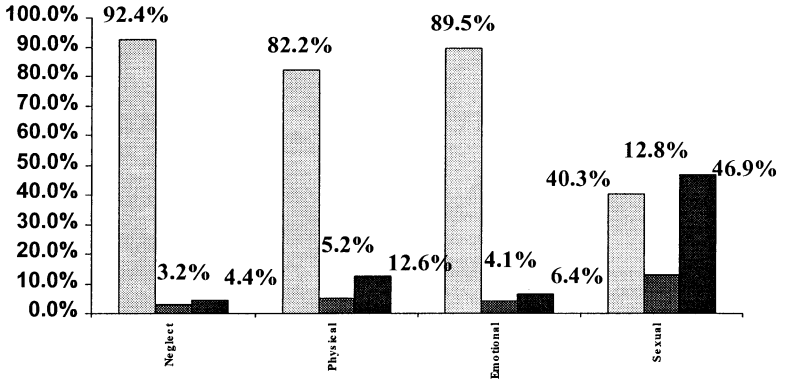

Figure 6. Perpetrator Group for Maltreatment Type.
Immediate Family
Extended Family
Extrafamilial

contrast, there were 712 male (60.4%) and 300 female (29.6%) maltreated children with an identified disability. There was a significant difference between genders as a function of disability status. Males were more prevalent among maltreatment victims with disabilities while females were more prevalent among maltreated victims without disabilities, [χ^2 (1, N = 4,503) = 212.15, $p < .001$]. Importantly, the nonmaltreated group of children with disabilities was also predominantly male (69.1%). Thus, the association was between disability status and gender, not maltreatment and gender. Among maltreated children with disabilities, significantly more girls than boys were victims of sexual abuse [χ^2 (1, N = 1,012) = 81.01, $p < .001$]. However, males with disabilities significantly outnumbered females with disabilities as victims of physical abuse [χ^2 (1, N = 1,012) = 6.81, $p = .009$] and neglect [χ^2 (1, N = 1,012) = 8.82, $p = .003$]. In contrast, among nondisabled maltreated children, significantly more girls were victims of neglect [χ^2 (1, N = 3,491) = 43.99, $p < .001$], physical abuse [χ^2 (1, N = 3,491) = 4.56, $p = .033$], and sexual abuse [χ^2 (1, N = 3,491) = 300.82, $p < .001$].

Figure 6 presents the perpetrator groupings (immediate family, extended family, and extrafamilial) by type of maltreatment. There is a significant association between the familial status of the perpetrators and type of maltreatment. Immediate family members accounted for the vast majority of neglect (92.4%), physical abuse (82.2%), and emotional abuse (89.5%) while extrafamilial perpetrators (59.3%) were significantly more often the perpetrators of sexual abuse [χ^2 (1, N = 4,503) = 1101.74, $p < .001$]. However, immediate family and extended family taken together accounted for 53.1% of the sexual abuse. Gender was significantly related to perpetrator groupings. Females were responsible for 67.4% of the maltreatment committed by immediate family members while males accounted for 59.8% of the extended family and 88.5% of the extrafamilial maltreatment due to the preponderance of males as sexual abuse perpetrators [χ^2 (1, N = 4,503) = 372.27, $p < .001$].

Maltreatment and Disability Diagnosis

Overall, there was a strong association between disabilities and neglect, with disabled children being 3.76 times more likely to be victims of neglect than children without disabilities [χ^2 (1, N = 40,211) = 1321.50, $p < .001$]. Children with disabilities were 3.79 times more likely to be physically abused than children without disabilities [χ^2 (1, N = 40,211) = 800.03, $p < .001$]. Children with disabilities were 3.14 times more likely to be sexually abused than children without

Table 4. Relative Maltreatment Risks for Specific Disabilities

	Visual Impairment	Hearing Impairment	Speech/ Language	Mental Retardation	Behavior Disorder	Learning Disability	Health Impairment	Autism	Physical
Neglect	1.5	2.3	4.7	3.7	6.7	2.0	3.4	1.3	1.8
Physical Abuse	**	3.8	4.7	3.8	7.3	2.0	3.3	**	1.2
Emotional Abuse	2.0	2.0	6.6	3.8	7.0	2.0	3.4	**	2.5
Sexual Abuse	1.2	1.2	2.9	4.0	5.5	1.8	2.0	**	2.0

**No increased risk.

disabilities [χ^2 (1, N = 40,211) = 330.92, $p < .001$]. Children with disabilities were 3.88 times more likely to be emotionally abused than children without disabilities [χ^2 (1, N = 40,211) = 671.66, $p < .001$]. Children with behavior disorders and mental disabilities were the most likely to be emotionally abused [χ^2 (4, N = 40.211) = 907.23, $p < .001$]. Again, it should be noted that emotional maltreatment was rarely noted in the absence of other forms of maltreatment. In view of the fact that emotional maltreatment is largely defined in terms of consequences, the finding that emotional maltreatment is most prevalent among those with behavior disorders should not be surprising.

A relative risk matrix for all types of maltreatment among children with specific disabilities is given in Table 4. The relative risk probability compares the risk for maltreatment between children with specific disabilities to those of children without disabilities. Children with visual impairments are at slightly greater risk to be neglected and sexually abused and twice as likely to be emotionally maltreated than children without disabilities. Deaf and hard-of-hearing children have twice the risk for neglect and emotional abuse and almost four times the risk for physical abuse than nondisabled peers. They are not at increased risk to be sexually abused. Children with speech and language impairments have essentially five times the risk for neglect and physical abuse, almost three times the risk for sexual abuse, and almost seven times the risk for emotional maltreatment. Mentally retarded children have four times the risk for enduring all four types of maltreatment in comparison to nondisabled children. Children and youth with behavior disorders are seven times more likely to experience neglect, physical abuse, and emotional abuse, and 5.5 times as likely to be sexually abused than children without disabilities. Children with learning disabilities are essentially twice as likely to endure all four types of maltreatment. Children with health related disabilities are three times as likely to be neglected, physically, and emotionally abused and twice as likely to be sexually abused. Autistic children are at slightly increased risk to be neglected. Children with orthopedic disabilities are twice as likely to be emotionally maltreated, sexually abused, and neglected than children without disabilities.

Family Stress Factors

To determine whether maltreatment and disabilities were associated with other behavioral and social insults, the family stress factors were aggregated into a single scale reflecting the algebraic combination of each of the 11 events identified in the children's records. Importantly, each of these additional stressful life events was *not* identified as the specific maltreating episode. The aggregated family stress factors scores were then contrasted among the seven most prevalent maltreatment categories and the disability groups using ANOVA. As shown in Figure 7, there were statistically significant effects for both maltreatment and disabilities, with children experiencing multiple forms of maltreatment experiencing an increasing number of family stress factors, F(1, 40,211) = 1252.75, $p < .001$. Clearly the children who were neglected or who experienced neglect with other forms of maltreatment experienced the largest number of additional familial stress factors. Although statistically significant, the absolute differences among disability groups were modest. In

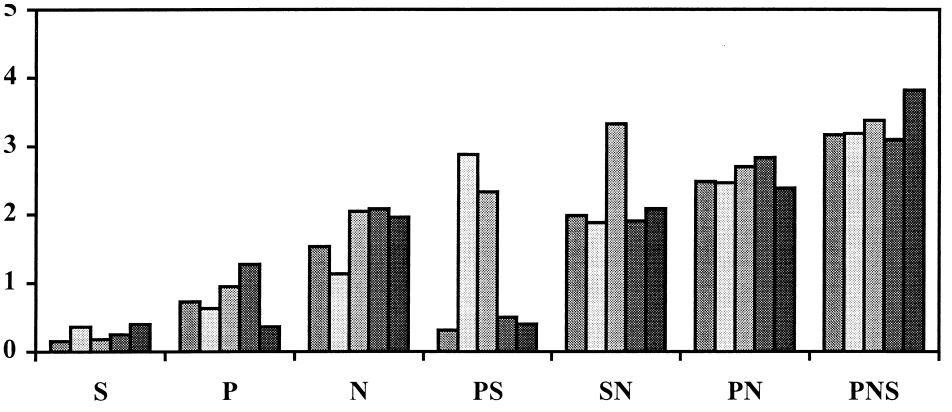

Figure 7. Mean Number of Family Stress Factors Identified in Maltreatment and Disability Groups.

general, this pattern indicates that maltreated children are also exposed to a host of additional stressful life events. Additionally, preschool and elementary aged children had significantly more family stress factors cited in their maltreatment records than did maltreated children in middle or high school groups [χ^2 (27, N = 4503) = 552.01, $p < .001$].

School Performance and Attendance

The influence of maltreatment and disability on number of days absent during the school year was assessed using a four-factor (physical abuse, sexual abuse, neglect, disability) ANOVA. Although main effects for each factor were obtained, the statistically significant interaction reflected the fact that school attendance was related to both maltreatment and disability status. Overall, there was an ordinal pattern to the interaction, with children who were both maltreated and disabled missing the most school days and nondisabled nonmaltreated children missing the least, F (3, 40,211) = 403.31, $p < .001$ (see Figure 8). There was a clear pattern of an increasing number of missed school days by children who had experienced multiple forms of maltreatment. In general, however, neglect alone, or in combination with other forms of maltreatment, had a greater impact on school attendance than the other forms of maltreatment.

The influence of maltreatment and disability status on school performance was determined by completing four factor ANOVAs based on the CAT mathematics and reading scores achieved at the most recent administration. It should be noted that children too young to complete the CAT and children who could not complete the CAT because of their disabilities were not represented in the analyses. Thus, these analyses under-represent young children and severely disabled children. Although it is not surprising that students with a disability would perform more poorly on standardized tests of achievement, there was a statistically significant interaction between maltreatment and disability status. Significantly higher academic achievement in both reading, F (3, 40,211) = 1120.41, $p < .001$, and math, F (3, 40,211) = 1078.32, $p < .001$ was achieved by children without disabilities who were not victims of maltreatment. The lowest academic achievement scores were among maltreated disabled children (see Figures 9 and 10).

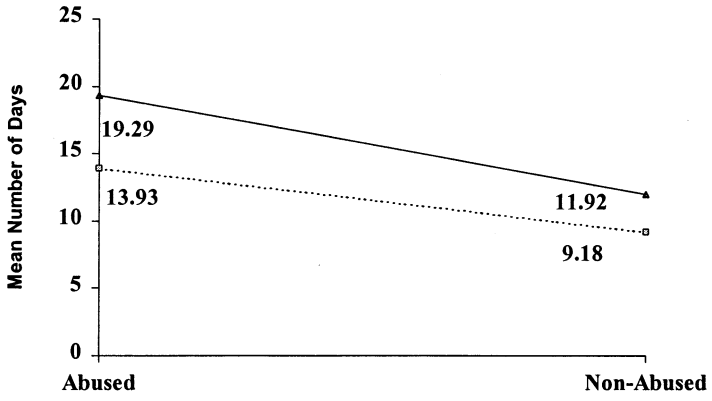

Figure 8. Mean Number of Days Absent for Abused and Nonabused Children With and Without Disabilities.
Non-Disabled —
Disabled - - - -

DISCUSSION

The findings of the present research provide unequivocal evidence that there is a strong association between childhood disabilities and child maltreatment. The 31% maltreatment rate among children with disabilities, in contrast to the 9% rate for nondisabled children, provides further support for the notion that children with disabilities are at increased risk for having been maltreated. Indeed, disabled children were 3.4 times more likely to be the victim of some type of maltreatment than their nondisabled peers, a risk factor coefficient approximately twice that estimated by the Westat, Inc. (1993) study using the methodology of NIS-2 and collecting data from 35 CPS agencies selected to be nationally representative of US counties. Although the difference might reflect region differences, it is more likely to be due to methodological differences. Because the Westat study only sampled CPS agency records, the study was probably largely limited to cases of intrafamilial abuse. Additionally, the Westat study used CPS records to establish disability, whereas the present study used the school-based records. Any educationally relevant disability should have been included in the present study, but some such disabilities could be

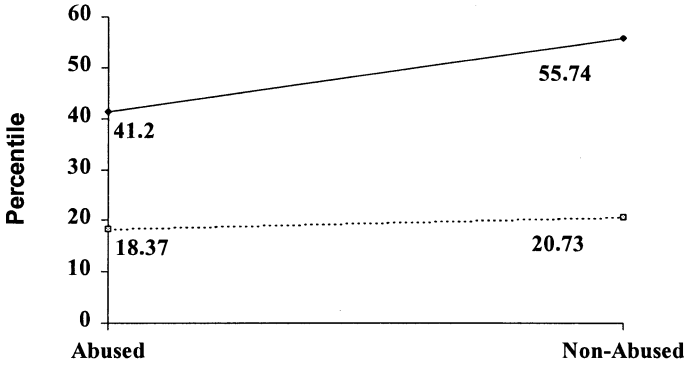

Figure 9. Mean CAT Reading Percentile Ranks for Abused and Nonabused Children With and Without Disabilities.
Non-Disabled —
Disabled - - - -

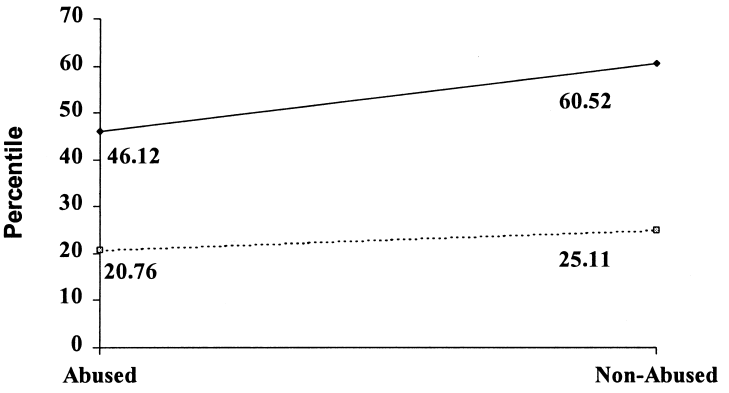

Figure 10. Mean CAT Math Percentile Ranks for Abused and Nonabused Children With and Without Disabilities.
Non-Disabled —
Disabled - - - -

omitted in the Westat, Inc. (1993) study. As a systematic replication of the recent Sullivan and Knutson (1998) hospital-based study, the current findings, uncompromised by sampling error or bias, can be seen as offering unambiguous support for those who have championed the position that there was a link between disability and maltreatment (e.g., Ammerman, 1991; Sobsey, 1994).

The types and percentages of children with various disabilities receiving special education services in this school-based sample are not inconsistent with available data on disability statistics from the US Department of Education (Kaye, 1997). Some 12.2% of children in American schools were officially designated as having disabilities during the 1993–94 school year. This is somewhat higher than the 8% rate of children with disabilities within the Omaha schools, but there are, of course, regional differences. Nationally, the majority of disabled children (71%) have learning disabilities, behavior problems, and mental retardation. Taken together, these same three types of disabilities comprised 73.8% of the disabilities in the OPS population. However, there were fewer OPS children with speech and language disabilities than in the national prevalence estimates. Health-related impairments in the current research population are considerably higher than reported in the national prevalence estimates. The most prevalent disabilities among the maltreated children (i.e., behavior disorders, mental retardation, and learning disabilities) are not consistent with the Westat, Inc. (1993) findings in which speech/language disabilities were highly prevalent and mental retardation was not. Importantly, in the current research, the three most prevalent types of disabilities in US special education are also the most prevalent disabilities among children who were victims of maltreatment.

To consider the implications of these findings, it is also important to consider the overall maltreatment prevalence rate. The maltreatment prevalence rate of 11% within the school-aged population approximates the 14% rate obtained in the earlier hospital-based sample (Sullivan & Knutson, 1998) drawn from the same community. These rates are higher than the 6% annualized incidence rate derived by National Incidence Study (NIS-3; Sedlak & Broadhurst, 1996). Although the entire studied population had not passed through the age of risk, the overall maltreatment rate of the present study more closely approximates an index of life-time prevalence than an annual incidence rate. Thus, it is not surprising that the obtained maltreatment rates are higher in the present study. It should be noted that NIS-2 and NIS-3 estimated that fewer than 50% of the maltreatment known to reporters were actually reported to the relevant CPS agencies. By merging CPS records (i.e., NDSS) with law enforcement and foster care records, large numbers of records of maltreatment that were not recorded in CPS central registries were included in the present study.

Thus, while there is little doubt that undiagnosed maltreatment is represented in the control condition, it is unlikely that the prevalence estimates of the present study would be a gross underestimate of the maltreatment rate in the Omaha community. The marked difference between maltreatment prevalence rates in the public and parochial schools does point to possibly important diagnostic or prevalence differences between subcultures. Certainly the data would suggest that the parochial schools are serving a population that is distinguishable on the basis of both maltreatment and disability.

Consistent with our earlier work (Sullivan & Knutson, 1998), children with disabilities tend to be maltreated at younger ages. In fact, preschool age disabled children experience significantly more neglect, physical abuse, emotional abuse, and sexual abuse than disabled children in elementary, middle school, and high school age groups. This is in contrast to nondisabled children who tend to be maltreated during the elementary years (i.e., between the ages of 5 and 9). The maltreatment rates of nondisabled children in the present study are consistent with NIS-3, which identified an overall curvilinear maltreatment pattern as a function of age, with the lowest rates of maltreatment among preschool and high school children. In contrast, the Westat, Inc. (1993) findings indicated that children with disabilities greater than age 4 are at greatest risk for maltreatment. Given the young ages at which children with disabilities tend to be maltreated, early intervention and support services are critically needed for families with young children with disabilities. By concentrating prevention efforts on young children with disabilities, the period of maximum risk can be targeted.

Essentially 25% of maltreated children across school based age groupings (i.e., preschool, elementary, middle, and secondary) have some type of disability. Although cause and effect relationships between disability and maltreatment are not identifiable, patterns of apparent risk and outcome emerged. Some disabilities seem to be a risk for maltreatment in early years (i.e., communication and health/orthopedic) and others seem to be both a risk factor and a possible consequence in later years (i.e., behavior disorders and mental retardation). Further research is needed to assess maltreatment and age of risk among children with congenital and acquired disabilities.

Gender of the maltreatment victim was significantly associated with disability status. Among children without disabilities, more girls than boys are victims; among children with disabilities, the reverse is the case. Importantly, the relative frequency of male and female victims reflected a somewhat higher rate of abuse of males than would be expected on the basis of previous epidemiological data (e.g., NIS-2, NIS-3) or clinical studies identifying male victims at a rate of 13% of the sample (Mannarino & Cohen, 1986). However, given the high base rate of disabilities in the maltreated sample and the greater prevalence of disabilities among males (Sobsey, Randall, & Parrila, 1997; US Bureau of the Census, 1992; US Department of Education, 1991), it is likely that the greater prevalence of males reflects the greater prevalence of disabilities in the maltreated sample. Such findings are consistent with previous work identifying large numbers of male victims in studies of maltreatment among children with disabilities (Sobsey et al., 1997; Sullivan, Brookhouser, Scanlan, Knutson, & Schulte, 1991; Westat, Inc., 1993).

In both the hospital-based (Sullivan & Knutson, 1998) and the current study, perpetrators of the maltreatment of children with and without disabilities were overwhelmingly immediate family members. This is consistent with NIS-3 which identified family members as the primary perpetrators and inconsistent with the Westat, Inc. (1993) findings that children with disabilities were less likely to be maltreated by primary caretakers than their nondisabled peers. The use of multiple sources of substantiated cases of maltreatment and the consideration of multiple forms of maltreatment in the current study resulted in more extensive maltreatment data for the children and may account for these differences. Child abuse and neglect are societal problems that cut across medical, educational, social service, and legal disciplines and data must be obtained from all of these domains.

In the present study, neglect was clearly the predominant form of maltreatment, followed by physical abuse, emotional abuse, and sexual abuse. These findings are congruent with NIS-1, NIS-2, and NIS-3 and the Westat, Inc. (1993) study of abuse and disabilities. Moreover, the strong link between neighborhood economic disadvantage and neglect is consistent with other research (e.g., Drake & Pandey, 1996). Importantly, most maltreated children actually experience multiple forms of maltreatment; psychological or emotional abuse virtually never occurred in the absence of another form of maltreatment. The maltreatment literature has tended to focus on specific types of maltreatment, with investigators directing their attention to sexual abuse, physical abuse, or neglect. It should be noted that the Westat, Inc. (1993) study treated each type of maltreatment as unique and, accordingly, did not address multiple forms. The findings of the present study, with the vast majority of children experiencing more than one type of maltreatment, indicate that treating the subtypes of maltreatment as discrete entities may be misleading. For example, since few children experience only one form of maltreatment, efforts to understand the consequences of sexual abuse or physical abuse without taking into account the associated neglect are likely to yield misleading or incomplete conclusions. At the least, the findings support the argument to study physical abuse, or sexual abuse, in concert with neglect (Gauthier, Stollak, Mess, & Aronoff, 1996; Ney, Fung, & Wickett, 1994). In addition to the co-occurring maltreatment, the present study also implicated other possible familial insults that the maltreated children experience, including spousal or intimate violence. Clearly, the impact of maltreatment cannot be fully understood without an empirical consideration of other co-occurring factors.

Consistent with previous research (e.g., Eckenrode, Laird, & Doris, 1993; Eckenrode, Rowe, Laird, & Brathwaite, 1995; Kendall-Tackett & Eckenrode, 1996; Kurtz, Gaudin, Wodarski, & Howing, 1993; Perez & Widom, 1994; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994), child abuse and neglect was shown to have an adverse influence on academic achievement. In the current research, this was the case for maltreated disabled and nondisabled youngsters with both groups earning significantly lower scores in reading and mathematics than nonmaltreated peers. Although one would expect the academic achievement levels of children with disabilities to be suppressed, the magnitude of the effect of maltreatment on academic achievement was not expected. Because disabled children are less likely to participate in standardized testing, the combined influence of both disability and maltreatment on standardized test scores is likely to be an underestimate of the actual impact of maltreatment and disability on academic performance. Special education professionals need to monitor children's academic progress and be alert for signs of maltreatment among those children who are not achieving as well as expected given their disability. Certainly the impact of maltreatment on school attendance suggests one process by which academic achievement is compromised by maltreatment. Of course, the design of the present study does not permit the assessment of other correlated factors that could influence both the occurrences of maltreatment and academic performance.

It is important to note that neglect was virtually never educational neglect in the studied population. Although there is statutory support for educational neglect and it is a major factor in neglect recorded in NIS-3, educational neglect was not a basis for diagnosing neglect in the current data sets. Consequently, the impact of neglect on the school performance of the children is not merely a reifying of the neglect categorization.

Conclusions

The findings of the present study have implications for research, clinical practice, and public policy. Because the present data do not really address questions regarding cause and effect, future maltreatment research should consider the role of disabilities as either a risk factor or an outcome. Similarly, the significant number of maltreated children with disabilities and their apparent increased risk to be victims of maltreatment provides strong empirical support for the inclusion of

disability data in national incidence studies and state records (see Bonner et al., 1997). The vast majority of children with disabilities receive early intervention and special education services. Educators play a vital role in the identification, prevention, and treatment of child abuse and neglect, given their unique opportunity to advocate for children and the fact that schools are the only places in which children are seen outside of the home on a daily basis (Tower, 1992). Dealing with abuse and neglect is becoming a community issue and within that wider milieu, the schools must assume a major role. Results of the current research provide information regarding the incidence of abuse among children with disabilities within a school-based population and thereby should increase the vigilance of professionals working with special school populations.

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REFERENCES

Ammerman, R. T. (1991). The role of the child in physical abuse: A reappraisal. *Violence and Victims*, **6**, 87–101.

Barnett, D., Manly, J., & Cicchetti, D. (1991). Continuing toward an operational definition of psychological maltreatment. *Development and Psychopathology*, **3**, 19–29.

Bonner, B. L., Crow, S. M., & Hensley, L. D. (1997). State efforts to identify maltreated children with disabilities: A follow-up study. *Child Maltreatment*, **2**, 56–60.

Camblin, L. D. (1982). A survey of state efforts in gathering information on child abuse and neglect in handicapped populations. *Child Abuse & Neglect*, **6**, 465–472.

Child Abuse Prevention, Adoption, and Family Services Act of 1988. (1988, April). §§ 100–294.

Coon, K. B., Beck, F. W., & Coon, R. C. (1980). Implications for evaluating abused children: An independent study of the frequency of abused children referred to and enrolled in special education classes in a major southeastern United States metropolitan area. *Child Abuse & Neglect*, **4**, 153–156.

Coulton, C. C., Korbin, J. E., Su, M., & Chow, J. (1995). Community level factors and child maltreatment rates. *Child Development*, **66**, 1262–1276.

Drake, B., & Pandey, S. (1996). Understanding the relationship between neighborhood poverty and specific types of child maltreatment. *Child Abuse & Neglect*, **20**, 1003–1018.

Duncan, G. J., Brooks-Gunn, J., & Klebanov, P. K. (1994). Economic deprivation and early childhood development. *Child Development*, **65**, 296–318.

Eckenrode, J., Laird, M., & Doris, J. (1993). School performance and disciplinary problems among abused and neglected children. *Developmental Psychology*, **29**, 53–62.

Eckenrode, J., Rowe, E., Laird, M., & Brathwaite, J. (1995). Mobility as a mediator of the effects of child maltreatment on academic performance. *Child Development*, **66**, 1130–1142.

Flango, V. E., Casey, P., Dibble, T., Flango, C. R., Rubin, H. T., & Bross, D. (1988). *Central registries for child abuse and neglect: A national review of records management, due process safeguards, and data utilization*. Williamsburg, VA: National Center for State Courts.

Gauthier, L., Stollak, G., Mess, E., & Aronoff, J. (1996). Recall of childhood neglect and physical abuse as differential predictors of current psychological functioning. *Child Abuse & Neglect*, **20**, 549–559.

Kaye, H. S. (1997). Education of children with disabilities. *Disability Statistics Abstract*, **19**, 1–4. Washington, DC: US Department of Education, National Institute on Disability and Rehabilitation Research.

Kelbanov, P. K., Brooks-Gunn, J., McCarton, C., & McCormick, M. C. (1998). The contribution of neighborhood and family income to developmental test scores over the first three years of life. *Child Development*, **69**, 1247–1262.

Kendall-Tackett, K. A., & Eckenrode, J. (1996). The effects of neglect on academic achievement and disciplinary problems: A developmental perspective. *Child Abuse & Neglect*, **20**, 161–169.

Kurtz, P. D., Gaudin, J. M., Wodarski, J. S., & Howing, P. T. (1993). Maltreatment and the school aged child: School performance consequences. *Child Abuse & Neglect*, **17**, 581–589.

Mannarino, A. P., & Cohen, J. A. (1986). A clinical-demographic study of sexual abused children. *Child Abuse & Neglect*, **10**, 17–23.

Ney, P. G., Fung, T., & Wickett, A. R. (1994). The worst combinations of child abuse and neglect. *Child Abuse & Neglect*, **18**, 705–714.

Office of Human Development Services. (1988). *Study findings: Second study of national incidence and prevalence of child abuse and neglect: 1988*. Washington, DC: US Department of Health and Human Services.

Perez, C. M., & Widom, C. S. (1994). Childhood victimization and long-term intellectual and academic outcomes. *Child Abuse & Neglect*, **18**, 617–633.

Sedlak, A. J., & Broadhurst, D. D. (1996). *Executive summary of the third national incidence study of child abuse and*

neglect (NIS-3). Washington, DC: US Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, National Center on Child Abuse and Neglect.

Sobsey, D. (1994). *Violence and abuse in the lives of people with disabilities: The end of silent acceptance?* Baltimore, MD: Paul H. Brookes Publishing.

Sobsey, D., Randall, W., & Parrila, R. K. (1997). Gender differences in abused children with and without disabilities. *Child Abuse & Neglect*, **21**, 707–719.

Starr, R. H., Dietrich, K. N., Fischoff, J., Ceresnie, F., & Zweier, D. (1984). The contribution of handicapping conditions to child abuse. *Topics of Early Childhood Special Education*, **4**, 55–69.

Steinberg, L., Lamborn, S. D., Darling, N., Mounts, N. S., & Dornbusch, S. M. (1994). Over-time changes in adjustment and competence among adolescents from authoritative, authoritarian, indulgent, and neglectful families. *Child Development*, **65**, 754–770.

Sullivan, P. M., & Knutson, J. F. (1998). The association between child maltreatment and disabilities in a hospital-based epidemiological study. *Child Abuse & Neglect*, **22**, 271–288.

Sullivan, P. M., Brookhouser, P. E., Scanlan, J. M., Knutson, J. F., & Schulte, L. E. (1991). Patterns of physical and sexual abuse of communicatively handicapped children. *Annals of Otology, Rhinology & Laryngology*, **100**, 188-194.

Taplin, P. S., & Reid, J. B. (1973). Effects of instructional set and experimental influence on observer reliability. *Child Development*, **44**, 547–554.

Tower, C. C. (1992). *The role of educators in the prevention and treatment of child abuse and neglect* (DHHS Publication No. [ACF] 92–30172). Washington, DC: US Department of Health and Human Services.

US Bureau of the Census. (1992). *Americans with disabilities*. Washington, DC: US Government Printing Office.

US Department of Education. (1991). *Thirteenth annual report to Congress on the implementation of the individuals with disabilities education act*. Washington, DC: US Government Printing Office (ERIC Document Reproduction Service No. ED 332 488).

Westat, Inc. (1993). *A report on the maltreatment of children with disabilities*. Washington, DC: National Center on Child Abuse and Neglect.

Zuravin, S. J. (1991). Unplanned childbearing and family size: Their relationship to child neglect and abuse. *Family Planning Perspectives*, **23**, 155–161.