Stepchildren, Community Disadvantage, and Physical Injury in a Child Abuse Incident: A Preliminary Investigation

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Stepchildren, Community Disadvantage, and Physical Injury in a Child Abuse Incident: A Preliminary Investigation

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It is proffered that stepchildren are more likely than genetic children to be physically abused because they are unable to ensure the genetic survival of their adoptive parents. This abuse is theorized to be more pronounced in communities where social and economic resources are scarce. The salience of this cross-level interaction hinges on the assumption that the limited resources of a family are first allocated to genetic offspring because these children, unlike their nongenetic siblings, carry the genes of their parents. A multilevel analysis of child abuse incidents reported to police in 133 U.S. cities during 2005 shows that in cities with a high level of community disadvantage, stepchildren are much more apt than are genetic children to suffer a physical injury in a child abuse incident. Such a finding buttresses the position articulated by proponents of sociobiology.

Keywords: child abuse; stepchildren; NIBRS; community disadvantage

The physical abuse and neglect of children remains a persistent and costly problem in our society. An estimated three million incidents of abuse and neglect of children were reported to child protective services agencies in the United States during 2004. Authorities deemed approximately 872,000 children in these investigations to be victims of some form of abuse (U.S. Department of Health and Human Services, 2006).

The abuse of stepchildren is especially problematic. For example, Weekes-Shackelford and Shackelford (2004) found that stepfathers beat their children under the age of 5 years to death at a yearly rate of about 55.9 per million, as compared to a yearly rate of 5.6 for biological fathers. Research also shows that children living in households where the parents are not married experience a high level of abuse (Schnitzer & Ewigman, 2005). The consistently observed correlation between the genetic status of a child and abuse led Daly and Wilson (1988, pp. 87–88) to conclude that "stepparenthood per se remains the single most powerful risk factor for child abuse that has yet been identified."

Research suggesting that stepchildren who have a high probability of being abused has commonly been interpreted as being congruent with the logic associated with sociobiology, which maintains that all living organisms, including humans, have an incentive to ensure that their genes remain present within the population. Ensuring the survival of one's genetic

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makeup is referred to as inclusive fitness (Hamilton, 1964). Two distinct strategies are associated with inclusive fitness. The most direct way for an individual to contribute genetically to future generations is by producing viable offspring. A second more indirect method of ensuring one's genetic survival is for the individual to act in ways that enhance the survival odds of his or her relatives. This situation occurs because the relatives of an individual share a common descent. The observation that people are more inclined to act altruistically toward blood relatives than toward acquaintances or strangers is referred to as *kin selection* in the literature (Smith, 1964).

Drawing from the logic associated with genetic self-preservation, then, it is argued that nongenetic children will have a higher probability of being abused because they are not as genetically valued as genetic offspring.[1] However, it should be noted that proponents of this perspective do not claim that there is a specific and identifiable child abuse adaptation that has developed overtime. Rather, traits that allow organisms to outreproduce their same-sex, same-species rivals are simply favored in the process of natural selection. Natural selection produces a specialized psychological mechanism termed "child-specific love" that discriminatively allocates parental investment in offspring based on expected fitness. Because stepchildren contribute little to a parent's genetic fitness, they are more likely to face a deficit of this love. This dearth in love can ultimately result in physical abuse and even death (Duberman, 1975).

A child's genetic status is also not the sole predictor of the likelihood or the severity of abuse. Rather, the key determinate regarding abuse is the interaction between a child's genetic status and the availability of social and financial resources. The salience of this interaction hinges on the assumption that a family's resources are allocated to genetic offspring first because these children, unlike their nongenetic siblings, carry the genes of their parents. Thus, although aggregate levels of poverty affect the abuse of children generally (Coulton, Korbin, & Su, 1999), poverty is theorized to be more salient in the abuse of stepchildren.

PRIOR RESEARCH

Several empirical studies find that stepchildren are more apt than genetic offspring to suffer abuse at the hands of their parents (see Adler-Baeder, 2006 for a review of this literature). However, although clearly informative, there are several conceptual and methodological ambiguities that should be contemplated in evaluating the import of these findings. One damaging criticism is that the overrepresentation of stepchildren in child abuse statistics may be better explained by other alternative theories than by sociobiology. Advocates of these rival perspectives do not argue that evolutionary considerations have no consequences, but rather, that other factors have greater salience in explaining the abuse of nongenetic children. For example, selection theory maintains that the relationship between the genetic status of a child and abuse is spurious because of selection bias into blended families (Giles-Sims & Finkelhor, 1984). It is thus not the influence of evolutionary factors but rather the overrepresentation of individual characteristics among remarried parents such as low self-esteem, aggression, and the tendency toward violence that leads to the overrepresentation of nongenetic children as child abuse victims. Because these types of characteristics are correlated strongly with divorce, it is highly probable that many divorced individuals portraying these characteristics simply bring them into any new relationship that they forge. Such a situation would then elevate the risk of abuse for nongenetic children.

Any nexus between the genetic status of a child and abuse is also compatible with stress theory, which maintains that stepchildren have a greater proclivity for abuse because of the higher level of stress present in blended families (Giles-Sims & Finkelhor, 1984). Differences in causal mechanisms aside, these two alternative viewpoints provide a more complex view of the association between a child's genetic status and abuse than that predicted by sociobiology.

There are also methodological weaknesses associated with previous research that may lead one to question the veracity of studies that report a nexus between a child's genetic status and abuse. As Adler-Baeder (2006, p. 67) points out in her review of the literature,

> although the majority of the 11 studies reviewed suggest that stepchildren are overrepresented as physical abuse victims, most of these studies are limited by their small sample sizes, consideration of households rather than victim-offender relationship, and the use of a low comparison population estimate of children living in stepfamilies, leaving questions remaining about the comparative risk of physical abuse by a stepparent.

One damaging methodological criticism relates to the representativeness of the samples used in prior research. Most previous studies analyzed extremely small samples. For example, Daly and Wilson (1985) analyzed 99 cases; Daly, Singh, and Wilson (1993), 170 cases; Herrmann and Martin (1988), 137 cases; Daly and Wilson (1981), 177 cases; and Lightcap, Kurland, and Burgess (1982), 24 two-parent households. Most previous studies also employed samples drawn from a single city or from a few select geographical areas. The unrepresentativeness of these samples makes the findings generated in these studies difficult to generalize. It also seems conceivable that appreciable changes in sample composition might alter some of the effects observed in these studies.

Another methodological criticism pertains to the difficulty in identifying the relationship between the perpetrator and victim. Many studies were simply unable to determine whether the child was abused by a stepparent or by a genetic parent because researchers could only determine whether the abuse occurred in a household that included a stepparent (Adler-Baeder, 2006). This situation is problematic because "[k]nowing only the household composition . . . does not permit an exact test of the sociobiological hypothesis regarding the association between abuse and relatedness" (Malkin & Lamb, 1994, p.122). Interestingly, two studies that were able to control for the relationship between the offender and the child victim found little support for sociobiology. One study discovered that stepchildren were no more likely than were genetic children to be abused (Herrmann & Martin, 1988), whereas the other reported that stepchildren actually had a lower chance of being abused severely (Malkin & Lamb, 1994). In sum, because prior studies that assessed the relationship between a child's genetic status and abuse are vulnerable to one or more of these methodological criticisms, a compelling rationale exists for questioning the accuracy of their findings.

CURRENT STUDY

Recognizing the problems associated with previous studies, some have argued that researchers investigating the connection between a child's genetic status and abuse need to make use of richer data sources such as the National Incident-Based Reporting System (NIBRS) to advance the literature (Daly & Wilson, 2005). In this study, we merge data from the 2005 NIBRS with information contained in the 2000 census to examine the effect of the biological status of the child on the severity of child abuse. We also examine whether community disadvantage conditions the relationship between the genetic status of a child and the severity of abuse. Based on the logic that economic resources are allocated initially to genetic offspring, it is theorized that stepchildren will be more likely to suffer physical injury in a child abuse incident in cities that are socially and economically disadvantaged (Ellis & Walsh, 1997).

Our use of NIBRS aids in the empirical testing of the socioevolutionary perspective in a couple of important respects. One advantage is that it enables the creation of a theoretically relevant measure of child abuse by specifically identifying the relationship between the offending parent and the child who is physically abused. Thus, we are able to determine with data drawn from NIBRS whether a stepparent, genetic parent, or some other individual was involved in the abuse of the child. Many prior studies were only able to determine whether the abuse occurred in a household with a stepparent and not whether the stepparent was the actual perpetrator of the abuse. A second advantage is that the dataset contains geocode information that identifies the city where the child abuse incident occurred. These geographic identifiers are employed to match child abuse incidents with contextual variables such as community disadvantage that are speculated to be associated with child abuse.

DATA

The microlevel data were obtained from the NIBRS for 133 cities in 24 states during 2005 (Federal Bureau of Investigation, 2000). All of the 133 cities have an overall population of at least 50,000 people. Our dependent variable is coded as follows: 1 = *child suffered physical injury in the child abuse incident* and 0 = *child suffered no physical injury in the child abuse incident*. Physical injury encompasses apparent broken bones, possible internal injury, loss of teeth, severe laceration, unconsciousness, and other major and apparent minor injuries. A child is defined as a person 17 years of age or younger. Our use of a physical injury measure rather than an abuse incident measure is advantageous for a couple of reasons. First, the proportion of stepchildren living in families within a given area is difficult to determine. Thus, one city might have more child abuse incidents reported to police than another city simply because the first city has more families containing stepchildren in them. Second, there is a possibility that reports of stepchild abuse are more likely to receive official state action (Gelles & Harrop, 1991). This situation manifests itself because of the widespread belief among the general population that stepparents have a high propensity for child abuse (Claxton-Oldfield, 2000). The few studies that focused explicitly on the relationship between a child's genetic status and the severity of injury in a child abuse incident failed to support the sociobiology perspective (Herrmann & Martin, 1988; Sariola & Uutela, 1992).

The independent variable of theoretical interest at the microlevel is the genetic status of the child. Child abuse incidents involving stepchildren and children of a girlfriend or boyfriend are coded as 1, whereas incidents involving a genetic child are coded as 0.[2] In addition to this variable, our research seeks to account for other factors that might reasonably be posited to affect the seriousness of victim injury in a child abuse incident. These microlevel variables encompass criminal offense characteristics, criminal offender characteristics, and victim characteristics. Criminal offense characteristics account for whether a deadly weapon was used in the child abuse incident, whether the crime was sexual in nature, and the location of the crime. The offender characteristic variables include the age of the offender, the race of the offender, and the sex of the offender. The variables measuring victim characteristics include the age, the race, and the sex of the victim.

TABLE 1. Principal Component Analysis

	Percentage of Variance	Community Disadvantage Component
Percentage of the population that is Black or African American	77.202	.752
Percentage of the population (ages 25 years or older) that never graduated from high school	9.476	.851
Percentage of civilian labor force that is unemployed	6.409	.872
Percentage of households headed by a single female (ages 15–64 years) with children	3.348	.945
Percentage of households with public assistance income	1.984	.895
Percentage of families below the poverty level in 1999	1.580	.942

The between-city model analyzes several variables measured at the macrolevel. Sociobiology argues that the likelihood of physical injury occurring in a child abuse incident is going to be amplified in areas where social and economic resources are scarce. Drawing from previous research on domestic violence (Stolzenberg & D'Alessio, 2007), we incorporated a factor score from a principal components analysis of several indicators of community disadvantage into the analysis. A preliminary analysis suggested that these variables produced relatively high factor loadings, so we constructed an index in lieu of entering the variables separately in the models (see Table 1). The variables that embody this measure include the following: (a) percentage of the population that is African American, (b) percentage of the population (ages 25 years or older) that never graduated from high school, (c) percentage of civilian labor force that is unemployed, (d) percentage of households headed by a single female (ages 15–64 years) with children, (e) percentage of households with public assistance income, and (f) percentage of families below the poverty level in 1999. A high score on this composite variable indicates a greater level of community disadvantage.

Several other contextual variables were also included in the analysis. These variables, which are often reported to be correlated with violence generally, encompass the male population between 16 and 24 years of age, population density, and a dummy-coded variable indicating whether the city is located in the south or not. The means, standard deviations, and definitions for all the variables used in this study are displayed in Table 2.

MULTILEVEL ANALYSIS

Because the data are multilevel and the dependent variable is a dichotomy, we employed a nonlinear hierarchical modeling procedure to generate parameter estimates (Bryk, Raudenbush, & Congdon, 1996).[3] We modeled the intercept and the child's genetic status as random variables. All of the other microlevel variables were modeled as fixed because between-city variation for these variables was not of interest in this study. All the microlevel variables were centered by subtracting their grand means so that the mean of each variable was 0 across all cases.

TABLE 2. Descriptive Statistics and Definitions for the Incident (*N* = 5,795) and City-Level (*N* = 133) Variables

	Mean (%)	*SD*	Definition
Physical injury	(54)	—	Coded 1 if the victim suffered an injury (i.e., apparent broken bones, possible internal injury, loss of teeth, severe laceration, unconsciousness, and other major and apparent minor injuries), 0 if the victim suffered no injuries.
Stepchild	(20)	—	Coded 1 if the victim is a stepchild or child of boyfriend/girlfriend, 0 if the victim is a biological or adoptive child.
Deadly weapon	(5)	—	Coded 1 if the offender used a deadly weapon (i.e., firearm, knife, blunt object, motor vehicle, poison/gas, and fire/incendiary device), 0 if the offender used a nondeadly (i.e., personal weapons such as hands, feet, teeth, etc.; drugs; and asphyxiation), or no, weapon.
Sex offense	(19)	—	Coded 1 if the victimization involved a sex crime (i.e., forcible rape, forcible sodomy, sexual assault with an object, and forcible fondling), 0 if the victimization was nonsexual (i.e., kidnapping/abduction, robbery, aggravated assault, and simple assault).
Residence	(87)	—	Coded 1 if the crime occurred in a residence, 0 otherwise.
Offender's age	35.73	8.92	Age of the offender in years.
Offender male	(66)	—	Coded 1 if the offender is male, 0 otherwise.
Victim's age	10.60	5.10	Age of the victim in years.
Victim White	(58)	—	Coded 1 if the victim is White, 0 if the victim is Black.
Victim male	(43)	—	Coded 1 if the victim is male, 0 otherwise.

(Continued)

TABLE 2. Descriptive Statistics and Definitions for the Incident (*N* = 5,795) and City-Level (*N* = 133) Variables (Continued)

	Mean (%)	*SD*	Definition
Community disadvantage	.00	1.00	Factor scores from principal component analysis of 6 variables: (a) percentage of households with public assistance income, (b) percentage of the population (ages 25 years old) that never graduated from high school, (c) percentage of households headed by a single female (ages 15–64 years) with children, (d) percentage of civilian labor force that is unemployed, (e) percentage of the population that is Black or African American, and (f) percentage of families below the poverty level in 1999. Larger scores indicate greater disadvantage.
Percentage of male (ages 16–24 years)	7.40	2.90	Percentage of the male population prone to criminal activity (ages 16–24 years).
Population density	3,097.44	2,259.74	Population per square mile of land area.
Southern city	(34)	—	A dummy variable coded 1 if the city is located in the south, 0 otherwise. Controls for the possibility of a southern subculture of violence and crime.

Table 3 reports the between-city results. All the contextual variables were grand-mean centered. Inspection of intercept model in Table 3 shows the results for child physical injury across the cities. After both the microlevel and macrolevel variables are taken into account, the genetic status of a child is salient in explaining variation among the cities in the probability of a physical injury occurring during a child abuse incident. However, in contrast to position taken by advocates of sociobiology, stepchildren are significantly less likely than are genetic children to suffer an injury at the hands of their parents. Such a finding contravenes previous research that found stepchildren more rather than less likely to suffer abuse. The results also reveal that sex offense, crime location, and the offender's age all play a salient role in influencing the likelihood of physical injury. Controlling for other factors, child abuse incidents that are sexual in nature are less likely to involve physical injury to the victim. It is a common finding that rape and other sexual offenses, as compared to crimes such as robbery and assault, rarely culminate in serious injury to the victim (Thornhill & Palmer, 2000). In addition, physical injury is more likely to transpire in child

TABLE 3. Nonlinear Hierarchical Model Estimating the Probability of Physical Injury

	Coefficient	*t* Value
Intercept	.063	0.908
Community disadvantage	−.035	−.214
Percentage of male (ages 16–24 years)	−.017	−0.651
Population density	−.060e-3	−1.228
Southern city	.058	0.341
Stepchild	−.141*	−1.887
Community disadvantage	.125*	1.812
Percentage of male (16–24 years)	−.669e-3	−0.023
Population density	−.014e-3	−0.304
Southern city	−.096	−0.548
Deadly weapon	.162	1.397
Sex offense	−2.467***	−12.229
Residence	.557***	5.628
Offender's age	−.009**	−2.295
Offender White	−.144	−1.086
Offender male	.023	0.347
Victim's age	−.008	−0.864
Victim White	.165	1.205
Victim male	.024	0.469

Note. Results are estimated from population-average models with robust standard errors. *$p \leq .05$. **$p \leq .01$. ***$p \leq .001$ (one tailed test).

abuse incidents that occur in a residence. A residence is more likely than a public setting to provide privacy, and the degree of privacy afforded by the offender is associated with child abuse (Garbarino, 1977). The offender's age variable also shows some predictive power in the negative direction. The likelihood of physical injury increases as the age of the offender decreases. None of the contextual variables has any substantive impact on the prospect of physical injury occurring in a child abuse incident.

A visual inspection of Table 3 also reveals that there is a consequential effect of community disadvantage on the stepchild–physical injury slope. This effect is analogous to an interaction effect in ordinary least squares regression. Interestingly, stepchildren are more likely than genetic offspring to experience a physical injury in cities with a high level of community disadvantage. Specifically, the exponentiated value of the coefficient indicates that at its center (grand mean value), a one-unit increase in community disadvantage is associated with a 13% increase in the odds of a stepchild suffering a physical injury in a child abuse incident. The observed conditioning effect of community disadvantage on whether a stepchild endures a physical injury in a child abuse incident belies strong support for sociobiology. Concerning the other aggregate-level variables, none of them shows any predictive power in the model.

CONCLUSION

Using multilevel data for a number of U.S. cities, we undertook a test of whether stepchildren are more apt than genetic offspring to suffer a physical injury in a child abuse incident. We also sought to determine whether community disadvantage conditions the relationship between a child's genetic status and the likelihood of physical injury occurring in a child abuse incident. The assumption here is that stepchildren are more likely to suffer an injury in a city with a high level of community disadvantage. Contrary to expectations, our results showed that the effect of a child's genetic status on the likelihood of physical injury was in the opposite direction as predicted by sociobiology. Stepchildren actually had a lower probability of injury. This finding supports a few other research studies that report genetic offspring rather than stepchildren as having an increased proclivity to be abused severely (Malkin & Lamb, 1994; Sariola & Uutela, 1992).

Had we ended the analysis at this point, we might have reached the conclusion that socioevolutionary theory has little merit in furnishing a viable explanation for the abuse of stepchildren. However, the data available to us afforded the opportunity to examine the conditioning effect of community disadvantage on the severity of child abuse. Because social and economic resources are first allocated to genetic offspring, it was speculated that the abuse of stepchildren would be more pronounced in social contexts where resources were scarce (Ellis & Walsh, 1997). Our multilevel analysis furnished empirical support for this assertion. In cities with a high level of community disadvantage, stepchildren had a substantially higher chance of injury in a child abuse incident. This effect is discernable, net the inclusion of both microlevel and macrolevel control variables. Based on this finding, we must conclude that the effect of the genetic status of offspring on child abuse is more complicated than appreciated in most previous research.

This is not to say that we have satisfactorily resolved all the salient issues relating to the effect of genetic status on the likelihood of physical injury in a child abuse incident. We view it as a significant advance in our use of the NIBRS dataset, which contains information on the genetic status of the child who is abused. However, physical injury in a child abuse incident is only one of many conceivable measures of child abuse. In addition, because the NIBRS dataset only includes child abuse incidents reported to authorities, a determination could not be made whether there are substantive differences between stepchildren and genetic children regarding the likelihood of abuse. A large number of abuse incidents, especially instances of sexual and emotional abuse, fail to be identified by social or medical services or by the police (Ammerman, 1998). Thus, there might be some trepidation that a biased sample is responsible for our findings. We believe, however, that our findings are not a statistical artifact but rather reflect valid effects for a couple of reasons. First, as previously discussed, the few studies that focused on the severity of abuse rather than on the likelihood of abuse also found that stepchildren were less apt to be severely injured in a child abuse incident. Second, further analysis showed that community disadvantage conditions the relationship between the genetic status of a child and severity of abuse. There is simply no convincing statistical explanation for why stepchildren are less likely to suffer a physical injury in a child abuse incident generally but then have an elevated probability of sustaining a physical injury in cities with a high level of community disadvantage. A theoretical rather than a statistical explanation for these findings thus seems justified.

In sum, then, we are fully cognizant of the limitations of the data analyzed in this study, and readers should view our findings with some healthy skepticism. This study is only preliminary, and it would be premature for anyone to accept our findings and conclusions without question until further analyses are conducted. However, we do feel that this study furnishes an initial starting point for future empirical research in this area.

NOTES

1. Nongenetic offspring include stepchildren and children living with a nongenetic parent.
2. Because adoption involves the creation of a parent–child relationship whereby the adopted child has the same rights, privileges, and duties of a genetic child, the NIBRS dataset does not make a distinction between abuse perpetrated against a genetic child or an adoptive child. This situation is not problematic for our analysis. Adoptive children should not be subjected to the same abuse as stepchildren because such children are often related to the adoptive parents and adoptive parents are frequently unable to have children themselves.
3. We used the expectation-maximization (EM) method in SPSS 16.0, which applies maximum likelihood estimation (MLE), to impute missing data values (SPSS Inc., 2007).

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