

Child Homicide Victimization and Community Context: A Research Note

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Abstract—Among serious crimes, child homicide is a rather rare event. However, the killing of children stirs up a special type of emotion in society that pales other criminal acts. This study examines the relevancy of three possible community-level explanations for child homicide: social deprivation, female empowerment, and social isolation. The social deprivation hypothesis posits that child homicide results from lack of resources in communities. The female empowerment hypothesis argues that a higher female status translates into a higher level of capability to prevent child homicide. Finally, the social isolation hypothesis regards child homicide as a result of lack of social connectivity. Child homicide data, aggregated by US postal ZIP codes in California from 1990 to 1999, were analyzed with a negative binomial regression. The results of the negative binomial analysis demonstrate that social deprivation is the most salient and consistent predictor among all other factors in explaining child homicide victimization at the ZIP-code level. Both social isolation and female labor force participation are weak predictors of child homicide victimization across communities. Further, results from the negative binomial regression show that it is the communities with a higher, not lower, degree of female labor force participation that are associated with a higher count of child homicide. It is possible that poor communities with a higher level of female employment have a lesser capacity to provide the necessary care and protection for the children. Policies aiming at reducing social deprivation and strengthening female empowerment possess the potential to reduce child homicide in the community.

Keywords—Child homicide, deprivation, empowerment, isolation.

I. INTRODUCTION

AMONG serious crimes, the killing of children stirs up a special type of anger, horror and anxiety in society that pales other criminal acts [1]. Recent high profile cases and subsequent media coverage in various regions of the US attest to the disturbing nature of the social reaction toward child homicide. In spite of heightened reaction from the media and the general public, the occurrence of child homicide is actually rather rare. According to statistics from US Department of Justice [2], fewer than 2% of all homicides in a given year can be classified as child homicide involving victims 11 years old and younger. The rarity of child homicide among all crimes stands in sharp contrast with the intense public reaction because of the innocence and vulnerability of children.

Despite its rarity and recent decline [3], child homicide in the US is relatively high in cross-national comparison. According to a study conducted by Friedman et al. [4], the United States, as compared to other developed nations such as

Canada and United Kingdom, has the highest child homicide rate with the rate of eight per 100,000 people for infants, 2.5 per 100,000 for toddlers (age 1-4 years) and 1.5 per 100,000 for school age children (age 5-14 years) [5]. Furthermore, a recent report on causes of death for young children [6], lists homicide as among the top five causes of death for children in three different age groups (1-4 years, 5-9 years, and 10-14 years). Homicide remains a risk factor threatening children's wellbeing.

Child homicide also exhibits a lower degree of volatility compared to homicides victimizing adults and teens in that frequency of child homicide does not fluctuate precariously to the same degree as older victims. Researchers also have noted that the risk of child homicide declines with age as dependency and physical vulnerability of children subside. In contrast, older children are also more independent than their younger counterparts and are thus more capable of shielding themselves from potential offenders. Homicide victimization involving very younger children (three years and under) often result from abuse and are predominantly committed by family members [7]. Nevertheless, the true extent of child homicide can be difficult to document because many child deaths resemble accidental cases and other non-criminal causes.

Government statistics also show that a parent commits the majority of homicides involving child victims, especially younger children [8]. Statistics from the Justice Department show that from 1980 to 2008, about two-thirds of child homicides involving victims aged five years and under were committed by a parent, with both genders equally responsible for the crime (about 30% each). Of the remaining one third of the child homicide cases, male perpetrators were responsible for about 80% of the crimes. These men were often classified either as relatives, family acquaintances, or mothers' intimate partners. Children can also be collateral damage in a homicide-suicide scenario in which the primary targets were female adult victims. The presence of guns, prior incidence of domestic violence, and adult unemployment are listed as major risk factors. That is, the great majority of child homicide cases take place within the context of family relationships [9].

Most studies dealing with child homicide are oriented toward an individual-level explanation [10]. That is, there is a substantial body of knowledge about the characteristics of and relationship between victims and offenders involved in the killing of children. A fundamental research question still lingers within existing literature: under what social circumstances are child homicides more likely to occur? Specifically, within the existing literature, neighborhood-level

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explanations are not sufficient to provide a comprehensive explanation beyond individual characteristics. To shed light on neighborhood-level explanation, this study examines the three competing sociological explanations: women's empowerment (increasing woman's status leads to better protection of children, and lower child homicide), social deprivation (greater extent of social deprivation results in a higher extent of child homicide), and social isolation (a greater extent of isolation leads to a less support and protective network and higher level of child homicide).

II. DATA

Data for this study are from the "California Vital Statistics and Homicide Data, 1990-1999" file, which combines offenders' information reported by the police and victims' information recorded by the medical examiners [11]. This study only examines homicide victimization data as they provide more information on victims as compared to offenders. For example, the 10-year pooled data contain less than 10% of offenders' race reported by the police, but the race of over 90% of the victims is identified by medical examiners. Also, previous studies [12] show that there is a significant overlap between homicide victimization and offending in terms of structural and behavioral risk factors. A total of 34,542 cases are included in the dataset, of which 1,423 child homicide (age 11 years and under) cases are recorded. Since this study tests the impact of various community-level factors on child homicide, the case-level data is not of direct interest for the study. Instead, a US postal ZIP code level analysis is conducted to compare the varying degree of influence from different macro-level factors. A total of 1,678 ZIP codes in California are included as cases in the analysis.

III. MEASUREMENT

Dependent variable: Child homicides in this study include homicide victims who are 11 years old and under. Because the number of child homicides is relatively rare compared to that of other types of homicide, and to ensure a number high enough for a multivariate analysis, a pooled count of child homicides from 1990 to 1999 is used in this study. Specifically, the dependent variable refers to the pooled count of child homicides in each ZIP code area in the state of California. Further, a child homicide count for children aged three years and under is also aggregated for analysis to examine whether infants and toddlers succumb to different social dynamics than their older counterparts. The use of ZIP codes as unit of analysis in this study is a pragmatic choice as a proxy measurement of community. Previous studies that use metropolitan areas, counties, and ZIP codes, show that findings tend to converge among studies using different macro units of analysis. In other words, a ZIP code level analysis can yield insights into how various social dynamics at the community level affect how child homicide takes place.

Control variables: Previous literature suggests the following at-risk factors as key control variables to examine the

community dynamics within which homicide takes place. First, the percentage of the population aged between 15 years to 29 years, the most crime-prone age group, is used as a control variable in this study. In addition, median household income and percentage of adults who are divorced are also used as control variables in this study. Finally, it is possible that family strain, as measured by divorce rate, may be further exacerbated in neighborhoods plagued by a serious crime problem. To control this potential reciprocal effect between crime and family strain, a lagged homicide variable based on total homicide count in each ZIP code area in 1989 was constructed and used as a control variable.

Social deprivation: The social deprivation index is constructed as the average standardized scores of the following indicators: percentage of adults aged 16 years and older who are unemployed, percentage of adults over 25 years who do not have a high school degree, the percentage of the population that is black, the percentage of households headed by females, and the percentage of households living in poverty. Higher scores on this scale indicate a higher degree of social deprivation.

Empowerment: Following the examples from previous studies, two indicators are used to measure the degree of female empowerment. First, female labor force participation rate is measured by the percentage of females 16 years and older who are employed in the civilian labor force. The second indicator is the percentage of females with a college education¹. Both indicators are available in the census. Higher percentages of employed females and higher percentages of college-educated females reflect a higher degree of female achievement and, hence, a higher level of empowerment. As suggested in the previous literature, women with better resources and higher status are more capable of protecting both themselves and their offspring, therefore, resulting in a lower degree of child homicide.

Social isolation: Recent studies that test the impact of social isolation use individuals as units of analysis because the concept entails an attitudinal dimension. Because the unit of analysis in this study is the ZIP code areas, no such attitudinal measurement can be found in the census or in other aggregate measurements. Instead, this study employs a proxy measure of social isolation by focusing on structural factors that inhibit the degree of collective efficacy. The social isolation scale is composed of the average standardized score of the following indicators: percentage of foreign-born residents, percentage of linguistic isolation, and the percentage of renters in an area. Higher scores on this scale indicate a greater degree of social isolation.

IV. STATISTICS

Descriptive statistics are used to create a basic profile and a negative binomial regression is used to analyze the effects of various aggregate indicators on two child homicide variables. The use of a negative binomial regression instead of the commonly used ordinary least square (OLS) regression is based on the following characteristics of the data. First, child homicide is not only a rare event among all crimes but also a

crime that tends to have a skewed distribution. An analysis was conducted in this study that shows an obvious skewed distribution of child homicides among all California ZIP codes. Therefore, a Poisson regression is better suited to deal with count data instead of OLS regression which requires a normal distribution. Second, a prognosis test detects an overdispersion in the dependent variables used in this study. The assumption for using a Poisson estimation is violated as the variance exceeds the mean of the dependent variables (variance = 1.77 and the mean = 0.64). Negative binomial regression is used to correct such a violation [13].

V. DATA ANALYSIS

Table I presents the ZIP code level measurements for both the control and independent variables used to measure three competing hypotheses. As Table I illustrates, there is substantial variation for both the independent and control variables to be included in the multivariate analysis.

TABLE I
DESCRIPTIVE STATISTICS FOR THE ZIP-CODE LEVEL VARIABLES (N = 1,678)

Variables	Mean	Standard deviation
Child homicide (11 years and under)	0.6436	1.3261
Child homicide (3 years and under)	0.4392	0.9722
Social disadvantage index	-0.0014	0.6771
Percentage in poverty	0.1461	0.1061
Adults without HS degree	0.2184	0.1670
Adults unemployed	0.0475	0.0391
Percentage blacks	0.0437	0.0847
Percentage female household	0.3714	0.1161
Acculturation	0.09	0.57
Linguistic isolation	0.0980	0.5669
Population aged 15-29 years	0.1943	0.0744
Homicide 1989	1.94	4.78
Percentage divorced adults	0.1070	0.0590
Social cohesion	0.0189	2.588
Medium household income (in thousands)	47.26	21.23
Female labor force	26.875	6.568

This study employs a negative binomial regression technique to test the competing hypotheses concerning occurrence of child homicide at the ZIP code level. Results from Table II clearly indicate that of all independent and control variables, that the social deprivation scale has an unequivocal and significant impact on child homicide. Specifically, for victims aged three years and younger, an increase of one unit in the degree of social deprivation results in a 58% increase of child homicide. This strenuous impact is contrasted with weaker impacts from both the social isolation scale and the female labor force participation variable. Their respective impact is an 8% and a 3% increase in the occurrence of child homicide. For victims aged 11 years and younger, a similar pattern is observed with the exception that the social isolation scale does not have a significant impact on child homicide. Specifically, for every unit of increase in social deprivation, a 52% increase of child homicide is found. This compares to only a 3% increase for the female labor force

participation variable. Therefore, it is clear that communities that are high in social deprivation have higher child homicide count than neighborhoods that are low in social deprivation, regardless of how child homicide is measured. Female labor force participation has a significant but weak impact on the occurrence of child homicide. Communities with a higher female labor force participation rate are associated with a slightly higher child homicide count. It is also noteworthy to point out that the directions of the association between female labor force participation and child homicide is opposite of the expectation derived from the female empowerment hypothesis. Social isolation factor is only significantly related to child homicide victims aged three and younger. The log variable of the crime-prone age group and the homicide rate in 1989 are both significant and the directions of the impact are consistent with what would be expected according to previous literature. That is, communities with a higher percentage of young population and a higher homicide rate in 1989 experience a higher count of child homicide. This is true for both dependent variables. Neither median income nor divorce rate reached the level of significance.

TABLE II
NEGATIVE BINOMIAL REGRESSION OF CHILD HOMICIDE VICTIMIZATION

Variables	Victims aged 3 years and under	Victims aged 11 years and under
Social deprivation	^a 0.460*** (0.0684)	0.418*** (0.1178)
Social isolation	0.074*** (0.0159)	0.046 (0.0242)
Female labor force participation	0.025*** (0.0069)	0.025** (0.0097)
Population 15-29 years	0.027*** (0.0051)	0.044*** (0.0099)
Homicide 1989	0.040*** (0.0039)	0.110*** (0.0134)
Median income	0.0001 (0.0001)	0.0001 (0.0002)
Divorce rate	-0.007 (0.0085)	-0.003 (0.0121)
Likelihood ratio chi-square	176.588***	409.71***

^a Unstandardized regression coefficient with standard errors in parentheses

*P < 0.05, **P < 0.01, ***P < 0.001

Another way to interpret the results of the negative binomial regression is to describe the characteristics of the ZIP code areas, i.e., communities that are prone to have a high child homicide incidence. Data from Table II show that for younger victims aged three years and under, child homicide is more likely to happen in communities that are high in social deprivation (58% increase), somewhat high in the following four indicators: social isolation (8%), homicide rate in 1989 (4%), female labor force participation (3%), and young population aged 15 years to 29 years (3%). For victims aged 11 years and under, child homicide is more likely to happen in communities that are high in social deprivation (52% increase), moderately high in homicide rate in 1989 (12%), somewhat high in young population aged 15 years to 29 years (5%), and female labor force participation (3%). The prominence of social deprivation in affecting the occurrence of child homicide is beyond dispute.

VI. CONCLUSIONS AND DISCUSSIONS

The results of the negative binomial analysis reveal that social deprivation is the most significant factor among all other variables in explaining child homicide at the macro level. In contrast, social isolation factors have minimal impact on child homicide and female labor force participation explains only some of the variation in child homicide across communities. Further, results from the negative binomial regression indicate that it is the communities with a higher, not lower, degree of female labor force participation that have higher count of child homicide. This finding contradicts with the female empowerment hypothesis. Although, the correlation between female labor force participation and child homicide is rather tenuous, the incongruous findings suggest that other dynamics, not included in this study, may account for the unexpected finding. This study is limited by the lack of information that reveals the type of work that employs these women. Social isolation is not a significant factor in the analysis. Again, this study is limited by the lack of measurement that taps into the extensiveness of social network at the community level. Previous studies have demonstrated that the level of social capital is directly related to the ability of resolving collectively identified problems at the neighborhood level including the prevention of child homicide. Finally, the social deprivation factor which is a composite measurement consisting of five specific census level variables that have been shown in previous studies as strong predictors of crime. This study confirms the positive relation between social deprivation and crime and specifies that a strong correlation also exists between level of social deprivation and child homicide.

Even though data analyzed in this study are not the most current, results from this study can shed light on the understanding of how child homicide takes place in the community and potential strategies for prevention. At least three implications can be drawn from the findings. First, social deprivation factors, including poverty and unemployment, are the most consistent and substantive predictors in explaining child homicide at the neighborhood level. Second, the fact that results from this study do not support the female empowerment hypothesis does not mean that forces that increase women's status in society do not contain a protective effect. The minimal effect from the female labor force participation variable could result from the fact that it may not be a sufficient variable to measure female empowerment. As others have pointed out in previous studies, type of work may matter more than work per se to measure one's status; the nature of one's work reflects more of one's degree of independence and autonomy [14]. Limited by the availability of data at a ZIP code level, this study does not include any variable that measures the degree of autonomy at work. In addition, the direction of the correlation between female labor force participation and child homicide is opposite of the female empowerment hypothesis. That is, it is communities that have a higher percentage of working women that experience a high level of child homicide. Instead of raising the level of social status, certain type of work may further

reduce women's available resources because of the subsequent need for childcare and lack of supervision of children due to work commitment. Previous studies have shown that such a diluting effect due to work is particularly pronounced among low-skilled, low-paid women [15]. Communities with many overly extended women may experience a reduced level of protection of children who are either under-supervised and/or under the care of untrained and even dangerous individuals, thus, increasing the risks of child homicide. Finally, the focus of this study is on the impacts of various macro level factors of child homicide. Results of the study are clear in illustrating the importance of social forces within the community context that have substantive effect on child homicide. While specifying individual level factors such as the relationship between offenders and child victims is important, capturing risk factors that are beyond individual characteristics can further explain the social milieu within which child homicide occurs. Policies that are designed to prevent and reduce child homicide can then target neighborhoods that exhibit a high level of at-risk factors.

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