

JUVENILE-PERPETRATED HOMICIDE AND FAMILY DISORGANIZATION

by

BRITTANY N. MURRAY  
B.A. University of Central Florida, 2008  
M.A. University of Central Florida, 2011

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Major Professor: Lin Huff-Corzine

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## **ABSTRACT**

Juvenile-perpetrated homicide is a complicated and sensitive topic in the literature. Uncovering the potential influences on a juvenile is arguably important for recognizing the trends in juvenile behavior and the devastating consequences of some of this behavior. Family disorganization, a component to social disorganization as proposed by Elliott and Merrill (1934), explained that families with higher levels of social disorganization (as measured by factors such as poverty, welfare, and residential mobility) are expected to have higher numbers of juvenile delinquents. Using this theoretical frame, data from 1984-2006 on juvenile-perpetrated homicide in 91 of the largest cities in the United States was analyzed. This investigation uncovers relationships between the rate of juvenile homicide offenders and family disorganization in cities across the U.S. While more research is needed on family structure and other measures of family disorganization are needed to confirm these findings, higher percentages of female-headed households and owner-occupied housing were found to decrease the rate of juvenile homicide offenders in most models. On the contrary, unemployment, poverty, and higher percentages of public assistance were seen to increase this rate. Findings suggest that more research is needed on the family unit with regard to juvenile homicide offenders. This study further suggests avenues for assisting single-parent households and outlines the tools necessary to provide the best possible outcomes for our youth. The results not only provide insight for prevention efforts, but provide an updated foundation from which to build future research in this area.

Dedicated to Mabel A. Elliott and all other important contributors to social science research who have not been heard or have otherwise been overshadowed due to discrimination and unjust politics.

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## INTRODUCTION

The younger generations of today will one day be our doctors, law makers, law enforcement, teachers, leaders, and some will be our law-breakers. It is an understatement to say that these generations deserve our attention, understanding, and aid thus every effort should be made to provide just that. While juveniles can be a difficult population to access, uncovering the influences and outcomes of such influences in a juvenile's life yields knowledge essential to preventative and outreach attempts. We cannot prevent problems associated with our younger generations if we do not take the time to understand the factors that contribute to them thus studies like this one are needed. Juvenile delinquency is an area of the literature that can always use more attention; however, juvenile-perpetrated homicide is perhaps one of the most untouched pieces of this puzzle.

In 2013 there were 610 juvenile-perpetrated homicides, the lowest estimate since 1984 (OJJDP Statistical Briefing Book, 2015). Looking at the years between, however, there is much to be analyzed and explained in order to see the bigger picture and offer prevention policies for future spikes in this number. For instance, while the juvenile population was decreasing between the mid-1980s and the mid-1990s, the number of juvenile-perpetrated homicides increased to record highs (U.S. Census Bureau, 2014; OJJDP Statistical Briefing Book, 2015). Additionally, while rates for adult homicide offending were falling in the 1980's, the rates for juvenile homicide offending were climbing (OJJDP Statistical Briefing Book, 2015).

Since juveniles can be difficult to research and in part because the ratio of juvenile homicides to adult homicides is quite low, juvenile-perpetrated homicide is an area with many gaps in the literature. Homicide is a major social problem and our children are our future; it goes without saying that we must address both with extreme importance. Understanding where these juveniles are geographically, as well as in life, may serve as key components for understanding what leads a child to kill.

Of the research that has focused on juvenile homicide offenders, there have been trends recognized in gender, age, social environment, physical differences, and both psychological and neurological deficits that may influence violence among juveniles (Heide & Solomon, 2006; DiCataldo & Everett, 2007; Farrington, Loeber, & Berg, 2012). While recognizing that there are many facets to this social problem, this study will focus on developing a further understanding of social and environmental influences on juvenile homicide offenders. Overall, larger cities have experienced higher levels of crime and homicide throughout the literature (Law & Quick, 2013). While there are a few researchers that have focused much of their work on juvenile crime-- such as Clifford Shaw, Henry D. McKay, and, more recently, Kathleen Heide-- there is still much to be learned on this important subject. When researching juveniles, knowing their location and where they are being raised is a large part of understanding their social experience. The aim of this study is to uncover trends related to measures of social disorganization at the city and family level and the number of juvenile homicide offenders in an area.

The following sections explore the literature as it pertains to juvenile-perpetrated homicide, social disorganization, and the intersection between the two. While the literature on juvenile homicide is limited and dated, it is essential to see what trends have been shown thus far

and what the research here plans to expand upon. Social disorganization has been included and analyzed in countless research efforts; however, this theoretical framework has not been adequately applied to the study of juvenile homicide offenders or juvenile offenders overall. The literature that does exist on this juncture is limited and dated as well, but provides a foundation from which to start. Family disorganization, which is disorganization at the family-level as proposed by Mabel Elliott and Francis Merrill (1934), has not been investigated since the early 1900s, but play a large role in the analyses here. These first sections aid in explaining why this research is both needed and where researchers should begin the next steps to uncovering the current trends taking place.

## **JUVENILE HOMICIDE**

Until recently, little research focused on juveniles as homicide offenders or the factors which play a part in this phenomenon. Statistics show that juvenile boys commit murder more often than do juvenile girls; however, studies show distinct patterns in the victims targeted by each gender. For instance, Heide and colleagues (2011) found that, compared to boys, juvenile girls were more likely to kill younger victims as well as people to whom their relationships were closer, for example, parents and significant others. Juvenile boys were found more likely to murder those with whom they have more distant relationships or none at all, i.e. strangers, acquaintances, and rivals (Heide et al, 2011). Some findings have suggested that the motives behind these killings are different based on gender. Juvenile girls who murder are often involved in conflict or a highly emotional situation when the murder occurs. In contrast, juvenile boys are more likely to commit murder during the act of another crime, such as during a robbery (Roe-Sepowitz, 2009). Researchers have pointed out that there are various gender differences in homicide offending overall; however, more research is needed to better understand these trends (Heide et al., 2011; Roe-Sepowitz, 2009; Steffensmeier & Haynie, 2000).

According to SHR data from 1984-2006, Black and White juveniles comprised approximately 97% of homicide arrestees. For example, Black juveniles between the ages of 11 and 17 years old committed 20,679 homicides while White juveniles of the same age group committed 14,829 homicides (Puzzanchera, Chamberlin, & Kang, 2015). These estimates are alarming largely because the population of Black juveniles is significantly lower than that of White juveniles in the U.S., historically; however, there are disproportionately more Black

people experiencing economic deprivation than any other group in the United States. While there was a gradual decline after desegregation and other changes starting in the 1960s, the poverty rate for Black Americans has been around 30% since the 1970s. For comparison, the overall poverty rate has been around 15% with an average of 12% for White Americans for the same timeframe. While all of these rates have varied over the last few decades, the poverty rate for Black Americans is found to be consistently double, if not triple, that of White Americans throughout this timeframe (U.S. Census Bureau, Historical Poverty Table 2). Interestingly, when poverty levels are declining, often there is a decline in Black male homicide rates as well (U.S. Census Bureau, Historical Poverty Table 2; Cooper & Smith, 2011).

Extensive research on this subject shows that economic deprivation is harmful to a juvenile at the individual, family, and societal level. Juveniles in poverty are limited by the resources they can obtain and access from their communities. Their families are also not in a position to provide the same resources and aid as families above the poverty level. Areas marked by poverty are also seen in the literature to be those with the highest levels of crime, which is certainly pertinent in a discussion of juvenile crime (Strom & MacDonald, 2007).

Often juveniles who kill have various problems that contribute to their violent delinquency. Most juveniles who kill, for example, struggle academically regardless of their intelligence and are more likely to exhibit disruptive behavior in the classroom (Heide, 2003). Like most juvenile delinquents, many juvenile homicide offenders have problems that extend beyond the classroom; however. Often these young offenders have suffered abuse, neglect, mental and behavioral disorders, and lack attachment to pro-social others (Heide, 1999; Hirschi, 1969; Thornberry, 2009; Maughan & Moore, 2010). There is not a set mold for what a juvenile

homicide offender looks or acts like or a set background from which they come. However, through research we can see that these offenders are often victims long before they become offenders.

While recent research on the effects of social and environmental influences is limited with regard to juvenile-perpetrated homicide, some researchers have pointed out distinct characteristics of areas that have higher rates of crime. For instance, Strom and MacDonald (2007) found that cities with higher levels of social and economic disadvantage also had higher rates of violent offending, including homicides committed by juvenile delinquents. These findings, as well as others, highlight the importance of studying the social and structural environment in which juveniles live, particularly juveniles who commit violent crimes such as homicide. We have to begin by understanding the roots of the problem, which may very well be the social environment and conditions in which some juveniles live.

### Adult Homicide

While the focus here is on juvenile offenders, juvenile homicide offending accounts for a small fraction of homicide cases. Accordingly, adult homicide offending is noteworthy here as well. The rise and fall of homicide rates over the last few decades has largely resembled a rollercoaster. After a sharp rise in the 1970s, homicide rates dropped in the 1980s but subsequently rose again to one of the highest peaks yet in the 1990s. After the peaks of the 1990s, we saw a gradual decline in homicide rates and currently have one of the lowest rates

since the 1960s with only 14,249 homicides in the United States in 2014 (Puzzanchera, Chamberlin, & Kang, 2015).

The recent drop is good news, but points to the need for more information in an effort to prevent another spike. As longitudinal data show, these plummets in homicide do not necessarily last. Understanding the patterns and trends woven into the rise and fall of homicide offenses over the last few decades requires analysis of many factors, one important contributor being age. Uncovering the differences in these trends and the factors influencing these differences is crucial.

The biggest changes that have been seen in homicide offending have been in arrests of homicide offenders under the age of 35 years old, particularly between the ages of 18 to 24 years old. Youth gun violence was largely to blame for the peaks in homicide in the mid-1980's through the 1990s; young adults from the ages of 18-24 years old were found to have the highest homicide offending rate overall from 1980 to 2008 (Cooper & Smith, 2011). Much like juveniles, adult offenders often commit homicide in the act of another felony or in an argument of some sort. Guns are the most frequently used type of weapon among juveniles and adults; however, adults use guns more often—and have more access to them (Cooper & Smith, 2011). Overall, the literature on homicide for both adults and youth needs to be updated and better analyzed to understand the phenomena taking place here and why.

Another area to consider is the gray area between adolescence and adulthood that could help explain the higher rates of homicide among young adults. Adult homicide offenders range from 18 years old and older as the law dictates this status change. The maturity and, perhaps, the patterns of young adult offenders, however, may be different than that of older offenders (Arnett,

2000). This is pertinent to the topic of juvenile-perpetrated homicide as we may expect that the rates of young adult-perpetrated homicide to be related to the number of juvenile homicide offenders in an area. Recent research shows that there could be a delayed period of adolescence. Accordingly, young adults may exhibit closer trends to juvenile offenders potentially or provide a source of delinquent learning. While this study does not seek to dissect this intersection of research between juvenile and young adult homicide offending, it is an area in need of attention in the literature and will be introduced as a possible relationship in this study.

## **SOCIAL DISORGANIZATION**

Social disorganization has been applied as a theoretical framework for many types of analyses, particularly involving crime. While there are many contributors to this theory and many avenues from which to explore it, the analyses here focuses on a specific piece to this theory that has largely been ignored and forgotten. In the discussion of juveniles, tailoring the use of social disorganization to include measures that are specific to a juvenile's immediate environment are crucial to understanding the impact of social disorganization on juvenile behavior. This section will briefly introduce social disorganization as well as the extension of this framework that Elliott and Merrill (1961) offer.

In her early explanations of social disorganization, Elliott proposed that a reciprocal relationship existed between the individual, the family, and the community. These relationships can be productive and organized, dysfunctional and unorganized, or somewhere in between. Elliott and Merrill (1934) explained that neither total social organization nor total social disorganization can last and that social change, which is inevitable, is needed to bring balance into the picture. Social disorganization theory, as they proposed, explains the deterioration that occurs when social forces become unbalanced, leaving social expectations or norms unclear, and results in the destruction of social controls or anomie.

Emile Durkheim (1951), as interpreted by George Simpson, explained that the weakening (or lack thereof) of social relationships in society also weakens conformity to social rules and norms in society. Anomie is said to result when rules and direction are left unclear and confusion takes hold. Explained as a state of uncertainty, anomie may cause an individual to question

meaning and purpose in life and exhibit risky behavior (Durkheim, 1951; Thorlindsson & Bernburg, 2009). In sum, a society marked by higher levels of social disorganization may also be characterized by anomie, which could lead to higher levels of chaos, law-breaking, and potentially more homicide.

There were many contributors to the development and application of social disorganization theory, particularly Shaw and McKay (1942) who were among the first to link social disorganization at the community level to juvenile delinquency. Specifically, Shaw and McKay (1942) found that there were more juvenile delinquent boys living in or near the industrial and commercial areas of Chicago, whereas fewer delinquent boys were found to live in residential areas or areas farther from the city center. Findings also showed that more delinquent boys were found to be living in economically-deprived areas and that these boys were more often black (Shaw & McKay, 1942).

Elliott (1928) was perhaps the first to consider social disorganization as it exists in the family. Elliott and Merrill (1961) explained the impact that social disorganization has on the family as both a functioning unit as well as a functioning component contributing to both the individual and community-level organization. According to Elliott and Merrill (1961), social disorganization at either the societal or individual level would increase the pressures on and within the family causing it to be more vulnerable to higher levels of family disorganization. While family disorganization could weaken or otherwise change the bonds within the family, this could further influence the disorganization levels of those in the family as well as the community in which the family resides.

Social disorganization at any level is seen to produce crime and since juveniles are still considered to be living at home in some type of family unit, it would seem probable that more juvenile crime may result from family disorganization. While comparing measures of social disorganization at the city-level, this study seeks to address Elliott's claims of the changing--yet functional--family unit with measures of social disorganization at the family-city-level<sup>1</sup>.

### Mabel Agnes Elliott

Elliott played a pivotal role in the development of social disorganization theory and sociology as a discipline. Elliott (1934) was the first to publish a textbook on social disorganization; she also researched and published on the application of this theory at the same time as other better-known researchers in this area. Elliott's work was largely overshadowed by other researchers of her time, particularly by Robert Faris (1948) and his textbook which largely resembled Elliott and Merrill's (1934) social disorganization textbook (McGonigal & Galliher, 2009). During a time that was unfavorable to women overall, but especially in academia, Elliott struggled as a researcher and professor in a male-dominated field.

While she received much criticism and was not highly regarded by some of her colleagues, Elliott continued her research and was instrumental in the development and application of social disorganization and how it relates to delinquent youth and the families of

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<sup>1</sup> The data used here include variables at the city-year-level and include city characteristics which will be used both to analyze social disorganization at the community and family-level, with emphasis on the family. Social disorganization is typically measured at the neighborhood/societal-level. This study seeks to expand that by analyzing the families within some of the largest American cities. Understanding more about the families in which these juveniles come from is essential to explaining juvenile homicide offender background and behavior.

youth. Elliott's (1926) first pieces on the study of juveniles and family disorganization include her dissertation and book titled, *A Correlation between Rate of Juvenile Delinquency and Racial Heterogeneity: A Study of Juvenile Delinquency in Chicago* as well as a textbook in 1928 titled, *An Introductory Study of the Family Group*. Elliott's first conclusions about social disorganization, particularly at the family level, and juvenile crime is further defined in her textbook, *Social Disorganization*, which she wrote with Francis E. Merrill in 1934.

### Family Disruption and the Changing Family

Elliott and Merrill's (1961) research on the family and family-level disorganization emphasized the effects of divorce and separation on the downfall of family cohesion and functionality. She explained that when someone leaves the family during divorce, separation, or desertion, there is a "break" both at the family and, perhaps, individual level that makes a family even more vulnerable to higher levels of social disorganization (Elliott & Merrill, 1961). It should be noted, however, that Elliott and Merrill (1961) recognized that while divorce, separation, and desertion are often products of family problems and higher levels of family disorganization, they are not necessarily causes for disorganization. Like other researchers of their time and since, Elliott and Merrill (1961) proposed that single-parent households are also at a higher risk for social disorganization as there are less resources and guidance available to the children and the family as a whole.

Researchers at this time classified a "broken home" differently. Elliott and Merrill (1961) looked at many factors related to juvenile delinquency and the family including heredity,

delinquent siblings, parental rejection, social training, economic status, morality, and (as mentioned) divorce, separation, or death of a parent (Social Disorganization). All of these factors considered, Elliott (1928) found that an immoral family was more detrimental to the family unit and more predictive of juvenile crime than a broken one, or a family experiencing divorce or separation specifically. This finding suggests that the function of a family unit is based on more than just structure and that any “break” in this structure can be overcome or stabilized.

Much like other researchers have suggested, the lack of two parents/adults in a home often leads to children spending more time unsupervised, undirected, and perhaps left to spend time with and learn from delinquent others (Miller 2010). Elliott and Merrill (1961) explained that, in some cultures, divorce has little effect as the structure may shift but remain stable. This stability may be provided in that extended relatives are involved or the structure otherwise shifts, but is not left vulnerable to as many problems. In terms of juvenile crime, family morals must remain intact despite the changes produced. Accordingly, if the morals of the family remain favorable to lawful and moral conformity, the juveniles are less likely to offend (Elliott & Merrill, 1961). Again, Elliott and Merrill (1961) did not propose that social disorganization at the family level results from divorce or separation, but that divorce and separation often results from the breakdown of the family and potentially decreasing level of social organization within the family unit.

Perhaps one of the most interesting points Elliott and Merrill (1961) made, especially given the timeframe in which they wrote, is that the traditional family unit is changing and that this change is needed to restore balance. As Elliott and Merrill (1961) wrote:

When people speak wistfully or bitterly (as the case may be) about “the decline of the family,” they are thus referring to the decline of a particular type of family, not the family as such. The traditional, multifunctional, patriarchal, and agrarian family is clearly changing, and being succeeded by a new equalitarian, democratic, and urban family. The new family structure is emerging, with new statuses and roles for its members. [...] The family life may be changed but the family will continue to exist. (p. 353)

The changes we have seen in the last few decades were proposed in much of Elliott’s writing in the 1930s and 1940s. However, even more pertinent are the shifts we have seen away from the traditional, patriarchal family unit as currently there are many different family compositions in the United States. To take this further, Elliott and co-author, Willis Carter Beasley (1928), suggested, “One conclusion from contemporary criticism seems inevitable: patriarchal family life must perish completely [...] and [t]he patriarchal pattern is being disintegrated, no doubt about that” (p.99).

While the divorce rate in the United States has remained relatively stable, family structures and family composition have certainly changed. In the study presented here, divorce will not be included; a measure of female-headed households will be used instead. Elliott and Merrill (1961) placed emphasis on the effects of divorce and separation (single-parent household, lack of income and support, etc.)—not the actual divorce or separation. Accordingly, this measure will provide a more pertinent measure of single-family households than a relatively stable divorce rate could provide. It is difficult to measure the ties within the family and the breaks in these ties. Elliott and Merrill (1961), however, suggested that a family experiencing poverty, relying on public aid, and in unstable living conditions is likely to be experiencing

higher levels of social disorganization within the family than families that are not experiencing these adverse living conditions. A scale of family disorganization will be included to measure several factors that Elliott and Merrill (1961) both included and considered to be important to the study of social disorganization at the family level as it relates to juvenile crime.

### Measuring Family Disorganization

As stated previously, one common measure of social disorganization is economic deprivation, which is typically measured by poverty, population change, and the number of families on government assistance (Button, Tewksbury, Mustaine, & Payne, 2013; Law & Quick, 2013). Economic deprivation has been studied fairly extensively in relation to crime and delinquency. For example, Nikulina, Widom, and Czaja (2011) discovered that children living in areas of poverty have lower academic achievement while children in poverty, regardless of location, also had lower academic achievement and are more likely to become delinquent. Nieuwebeerta and colleagues (2008) reported a significant increase in the probability of homicide in neighborhoods with higher socioeconomic disadvantage as measured by an index including income, welfare status, family structure (one vs. two parent households), and the employment status of the head of the household.

Residential mobility or instability is another variable commonly used to measure social disorganization in an area. Residential mobility refers to the tendency for people to move in and out of an area without staying in the area very long (Coulton, Theodos, & Turner, 2012). An area characterized by high residential mobility is an area faced with continuous change and a lack of

social cohesion. The breakdown and loss of relationships and social ties at the community level often result from residential mobility, which can produce higher levels of social disorganization (Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997).

Kubrin and Herting (2003) examined the effects of residential mobility and established that it is a predictor of higher rates of homicide, specifically domestic and felony homicides. Neighborhoods characterized by disorder often have higher residential mobility, which means that fewer people will stay in the area, and it is assumed that fewer people will work to improve the community living conditions or establish roots (Steenbeck & Hipp, 2011). Residential mobility, while a good measure of social disorganization at the societal level, tells more about the family economic situation as well as the environment in which the family is living. This study will use the percentage of owner-occupied homes as a measure of residential mobility. An area with higher percentages of owner-occupied homes has less homes that are rented or otherwise short-term leased thus the resident turnover should be less as well.

Attempting to measure social disorganization at the family level can be difficult. While there are certainly many factors that could be included, the measures of poverty, public assistance, and owner-occupied housing will be used as a collective scale of family disorganization for this study. Unlike past research, this scale of disorganization will not include female-headed households as this measure will be analyzed separately.

## **SOCIAL DISORGANIZATION AND HOMICIDE**

Social disorganization theory has been applied in many studies of crime to reveal trends associated with measures of social disorganization such as poverty, single-headed households, racial and ethnic composition/conflict, and more (Shaw & McKay, 1942; Nikulina, Widom, & Czaja, 2011; Law & Quick, 2013). The positive relationship between homicide and the measures of social disorganization have been documented in the literature; however, the details about these relationships, however, remain unclear (Mares, 2010; Lee & Bartkowski, 2004; Diem & Pizarro, 2010).

In addition to the measures discussed in the previous section with regards to family disorganization (i.e., poverty, public assistance, and owner-occupied housing), population, racial heterogeneity, and unemployment will be included as measures of social disorganization at the city-level. Population and population density have been included as a measure of crime throughout the literature and are generally found to be positively associated with crime. Due to increased competition for jobs and resources, as well as further issues caused by crowding of differing groups and cultures, increased population often makes an area vulnerable to both crime and social disorganization (Kubrin & Herting, 2005, Cooper & Smith, 2011).

Heterogeneity refers to the probability that two people chosen at random would not belong to the same group. Ethnic and racial heterogeneity have been included as measures of social disorganization and social discord since the birth of the social disorganization theory. While Elliott is cited as using measures of racial heterogeneity back in the 1920s, she did not

provide a clear formula of how to measure this construct (or perhaps this is not available or easily accessed like much of her work).

In his book, "Inequality and Heterogeneity," Blau (1977) emphasized the importance of social associations between groups and the conflicts that can arise from the presence of multiple groups in one area. Blau (1977) explained that heterogeneity maximizes when each group in the population is equal to 50%, or heterogeneity equals 1. Researchers such as Sampson (1984) have applied Blau's (1977) theory and equation of heterogeneity and found positive correlations between heterogeneity and intergroup conflict. Ethnic and racial heterogeneity has often been seen to have a positive relationship with homicide, further suggesting that conflict is higher in areas with more diversity (Lanier & Huff-Corzine, 2006). For this dissertation, Blau's (1977) equation of heterogeneity will be applied to measure racial heterogeneity as it relates to the number of juvenile homicide offenders in an area.

Unemployment can be disastrous at the individual, family, and societal level. Areas marked by high unemployment are found to have higher levels of social disorganization and crime. As Elliot and Merrill (1961) wrote, "The inability to secure work disorganizes the community in many ways." With higher unemployment, support for churches and schools decreases, economic crimes increases, and more conflict is likely to result as the competition for jobs becomes higher (Elliott & Merrill, 1961). As stated, unemployment undoubtedly plays a role in the organization level of the individual, family, and society. Thus, unemployment as a societal (city)-level measure of social disorganization will be included in this study.

Multiple studies have examined homicide using the social disorganization theory. Few, however, have looked at juvenile homicide with this theoretical lens (Ousey & Augustine, 2001; Mares, 2010; Heide, 2003). Also, many studies have urged researchers to look further into the differences in types of homicides and the potential differences in the causes behind them (e.g., Heide, 2003; Mares, 2010; Sellers & Heide, 2011). Juveniles are considered a sensitive population by Institutional Review Boards, making them a more complicated age group to obtain the right to study. The study here presents multi-year analyses on the number of juvenile homicide offenders in large cities in the United States using social disorganization theory to uncover trends and patterns that may exist. These findings not only contribute to a deserving area of research, but provide information that may be helpful in attempts to reduce and prevent homicide offenses among juveniles.

## METHODS

For this study, city-year-level data on juvenile homicide will be analyzed by using the Intercity Variation in Youth Homicide, Robbery, and Assault dataset (1984-2006) available through the Inter-university Consortium for Political and Social Research (ICPSR) dataset #30981. This data set was compiled by researchers at the Vera Institute of Justice, RTI International, and the University of California in an effort to estimate trends in juvenile-perpetrated homicide for youth 13-24 years old (only 13-17 years old will be used in this study) in the United States over a period of approximately 20 years. These longitudinal data include estimates of youth homicide in 91 of the 100 largest cities in the United States from 1984-2006 and were primarily acquired from the Supplementary Homicide Report (SHR), which is part of the FBI's Uniform Crime Report (UCR). Homicide offenders were calculated annually for each city and then the data were further divided by age groups (juvenile: 13-17 years, young adult: 18-24 years old). For this study, only data related to the younger age group will be included as the focus is on juveniles and 18 years and older would be considered an adult. Also, juveniles are a better measure of the family as minors are expected to reside in some type of family unit.

This data set was chosen because, as noted in the literature, higher levels of social disorganization are seen in larger, more populated cities; thus, this data set fits the demands of this study (National Archive of Criminal Justice Data, 2013; Puzzanchera, Chamberlin, & Kang, 2013). Another reason for choosing to analyze the largest cities is further supported by Elliott and Merrill's (1961) account of social disorganization and crime. Elliott and Merrill (1961) explained that urban areas, or cities (particularly areas with higher population density, or people

per square unit) are more likely to experience social disorganization. Accordingly, they are also more likely to have higher crime rates due to increased competition for resources and employment. Elliott and Merrill (1961) noted that crime is higher in more populated areas because there are more opportunities for both learning and committing crime. Recent researchers have chosen to study large cities as a means to examine homicide rates for these same reasons (Parker & Pruitt, 2000; Diem & Pizarro, 2010).

To appropriately capture the impact of social disorganization on juvenile homicide, large cities will be analyzed here. Several variables measuring social disorganization at the city-societal and family-city level will be included in the analysis as a means of measuring which factors have an impact on the number of juvenile homicide offenders in the United States from 1984-2006. These variables are discussed in more detail in the following sections.

### Dependent Variable

The dependent variable for this study is the number of juvenile homicide offenders in each city each year from 1984 to 2006. The number of juvenile homicides for each city will be analyzed using various independent variables to test whether effects of social disorganization and related variables influence this number. By comparing the cities, analyses can reveal which cities exhibit higher numbers of juvenile homicide and, perhaps, see why this is the case. By analyzing each city based on the variables included, findings will highlight potential important differences and similarities among cities, thus making it possible to pinpoint causes and influences related to juvenile homicide. For this analysis, SPSS and Stata statistical software is used.

### Independent Variables

There will be several independent variables included: population, racial heterogeneity, unemployment, female-headed households, owner-occupied housing, proportion receiving public assistance, and poverty. In an effort to measure family disorganization, that is social disorganization at the family level and the potential influence of family disruption on the level of social disorganization in an area, a scale has been developed. For further investigation, initial analyses are included to encompass the potential contribution that young adult homicide offenses make to this discussion to juvenile offenders. The biggest changes seen in homicide trends thus far have been with this age group and this particular age group could be influential on the older juvenile population. In analyzing the immediate social network and environment of juveniles, this older age group may help account for influences of older peers and siblings. In the next section, the variable list describes these variables in more detail and the hypothesized relationships among the dependent and independent variables are provided as well.

## **VARIABLE LIST AND HYPOTHESES**

### Dependent Variable

JUVHOM (Juvenile Homicide Offenders (imputed) in each city per year, 1984-2006)

My dependent variable is a continuous (count) variable of the total number of juvenile (13-17 years of age) homicide offenders in each city per year from 1984-2006. This variable (JUVHOM1I) was renamed to JUVHOM and ranges from the lowest numbers of juvenile homicide offenders to the highest in each city per year. The range is 0 to 334 juvenile homicide offenders in a city per year. This variable did have missing data originally; however, the prior researchers who collected the data, conducted mean imputation to account for this. This variable as it is used here does not have any missing data and is left untransformed for the negative binomial analyses.

### Independent Variables

POP (Population)

The population (POP) variable is a continuous (count) variable that is coded lowest to highest with a minimum population of 92,047 to the highest population of 8,115,690 and a mean of 553,178. This is the total population of each city in the years 1984-2006. This variable has 108 missing cases that were coded as missing and eliminated from the analyses.

POVERTYDEC (Portion Living in Poverty)

The poverty (POVERTY) variable is total percentage of population in poverty in each city for the years 1984-2006. While this variable was coded as a percentage originally, I changed the variable into decimal form (POVERTYDEC). This variable is a continuous variable and is coded lowest to highest, the minimum being .04 (or 4% in poverty) and the maximum being 30.7 (or 30.7% in poverty). There was an average 14.6% (or .146) of the city in poverty based on this dataset.

#### ETHHET (Racial Heterogeneity)

The racial heterogeneity (ETHHET) variable was derived from Blau 1977 definition and equation of heterogeneity which, as explained above, refers to the probability that two people chosen at random would not belong to the same group. Racial heterogeneity is measured using Blau's 1977 equation which is the summed square of each proportion of each group subtracted from 1. The two groups presented in this study are Blacks and Non-Blacks. The percentage of Blacks was provided in the dataset which was used to create a percentage for Non-Blacks. Essentially, the equation used for this is the sum of the square of the percentage of Non-Blacks in the city and the square of the proportion of Blacks in the city subtracted by 1. The closer the sum of these two squared proportions equals 1, the more racial heterogeneity or racially diverse a city is. This is a variable measuring diversity more so than race and does not provide information specific to race. Racial heterogeneity ranges from 0 to 1, with the mean being .212 in this dataset.

#### FEMHHDEC (Percentage of Female-Headed-Household)

This female-headed household (FEMHH) variable is a total percentage of female-headed households in each city per year (1984-2006). This variable was coded as a percentage originally; however, as with many of the variables here, I changed the variable into decimal form for clearer analysis. This variable is a continuous variable and is coded lowest to highest with a minimum of .04 (or 4% of the households are considered to be female-headed household) and a maximum of .49 (nearly 50% of the households in the city are female-headed). The average portion of households that were female-headed households (per city per year) for this dataset is .2398 or approximately 24%.

#### PUBASTDEC (Percentage Receiving Public Assistance)

This public assistance (PUBAST) variable is a total percentage of those receiving public assistance in each city per year (1984-2006). This variable was coded as a percentage originally, but has since been coded into decimal form (PUBASTDEC). This variable is a continuous variable and is coded lowest to highest with a minimum of .0 (or 0% of the city is receiving public assistance) and a maximum of .26 (or 26% are receiving public assistance). The average percentage of people receiving public assistance in a city per year is 7.5% (or .075).

#### UNEMPDEC (Percentage of Unemployed)

This unemployment (UNEMP) variable is a total percentage of unemployment in each city per year (1984-2006). This variable was also coded from a percentage to a decimal (UNEMPDEC). This variable is a continuous variable and is coded lowest to highest with a minimum of .02 (or 2% of the city is unemployed) and a maximum of .21 (or 21% unemployment in the city). On average, 6.25% of a city per year was unemployed based on this data.

#### OWNOCCDEC (Portion of Owner-Occupied Homes)

This variable (OWNOCC) is a total percentage of owner-occupied homes in each city per year (1984-2006). Again, this variable was changed from a percentage to a decimal form and is a continuous variable, coded lowest to highest. For this data set, there was a minimum of .12 (or 12% of the city is owner-occupied) and a maximum of .69 (nearly 70% of the households in the city are owner-occupied). The mean percentage of owner-occupied homes in a city per year based on this data is 50%.

Note: This variable was scale-reversed (ownoccrev\*) when included in the scale (famscale) measuring family organization within the city. This scale is discussed below.

#### famscale (Family Organization Scale)

After a factor analysis of the variables and tests of reliability, this scale (famscale) was comprised of three continuous variables described above: poverty (POVERTYDEC), public assistance (PUBASTDEC), and owner-occupied housing (ownoccrev\*). Of these variables, the highest value .69 owner-occupied homes and the lowest value is that of public assistance (1.8%) so the values for each variable were divided into intervals of 7% and placed in a scale from -5 to 5, with the mid-point being zero. For instance, all values between 0 and .07 were coded as the lowest point on the scale (-5) indicating high family organization. On the other end, all values between .63 and .70 were coded as “5” representing the most disorganized point on the scale. The range of this scale is -5 to 5 and the scale has a mean of 0. A higher value on this scale is intended to represent higher levels of family disorganization in a city per year.

\*ownocrev is the reversed scale of OWNOCDEC (multiplied by -1). This recoding was done to reflect the same scale direction as the other two variables in the family organization scale (famscale), poverty and public assistance.

LATEHOM (Youth Homicide Offender Rate for ages 18-24 years old)

This variable is a continuous (rate) variable that measures the homicide rate of young adult offenders (ages 18-24 years old) in each of the included cities from 1984-2006. This variable ranges from lowest to highest (rate) including a minimum of 0 and a maximum of 464.93 or nearly 465 youth homicide offenses per 100,000 people in each city per year (1984-2006). The average rate of young adult homicide offenses per 100,000 people per year is 52.4 or approximately 53 offenses. This variable is included in the last table as a lead into future research.

While this older age group is considered legally mature, the actual maturity may not be much different than that of older juveniles. Understanding young adult homicide patterns and how these patterns may contribute to the offense rate of juveniles is both pertinent and necessary. Juveniles are heavily influenced by peers and older siblings, both of which may fall into this young adult offender category. This variable allows the initial exploration of this relationship.

fempov (Female-Headed Household and Poverty Interaction Term)

This interaction term was included to explain the moderating effect that poverty has on the relationship between female-headed households and the rate of juvenile homicide offenders. This variable was one of three created when the initial hypothesis concerning female-headed households in the city was unsupported, (The other two, fempub and femownoc, are discussed

below.) This interaction term helps describe how this variable interacts with the dependent variable based on the percentage of poverty in the city. This variable was created by multiplying the female-headed household variable (FEMHHDEC) by the poverty variable (POVERTYDEC). fempub (Female-Headed Household and Public Assistance Interaction Term)

This interaction term was included in various analyses to explain the relationship between female-headed households and public assistance in the included cities. This variable was created by multiplying the female-headed household variable (FEMHHDEC) and the public assistance variable (PUBASTDEC). This variable is intended to explore the relationship between female-headed households and the rate of juvenile homicide offenders in a city. By including this interaction, it is made clearer when and where the effect of female-headed households can be seen.

femownocc (Female-Headed Household and Owner-Occupied Housing Interaction Term)

This interaction term was included in various analyses to explain the relationship between female-headed households and owner-occupied housing in the included cities. This variable was created by multiplying the female-headed household variable (FEMHHDEC) and the owner-occupied housing variable (OWNOCCDEC). Both female-headed households, as well as the percentage of owner-occupied housing, have been seen to decrease the rate of juvenile homicide offenders. Accordingly, this interaction helps untangle the relationship. This interaction yields results on the circumstances where female-headed households can both increase and decrease the rate of juvenile homicide offenders.

## Hypotheses

This study initially had seven hypotheses. Three additional hypotheses were added (hypotheses 8, 9, and 10) when preliminary analyses indicated that, contrary to the literature, the number of female based households was negatively related to the number of juvenile homicide offenders. As explained in the previous section, interaction terms were used to analyze the relationship between the percentage of female-headed households and the number of juvenile homicide offenders a bit further. A hypothesis was added for each interaction: one for female-headed households and poverty, one for female-headed households and owner-occupied housing, and the final hypothesis for female-headed households and public assistance. By including these hypotheses, the results provide more insight into the relationships being explored here.

H<sub>0</sub>. The proportion<sup>2</sup> of those in poverty will not have an effect on the number of juvenile homicide offenders in each city.

H1: Cities with more poverty will have higher numbers of juvenile homicide offenders compared to cities with lower numbers of people living in poverty.

H<sub>0</sub>. The level of racial heterogeneity in a city will not have an influence on the number of juvenile homicide offenders.

H2: Cities with higher levels of racial heterogeneity will have more juvenile homicide offenders.

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<sup>2</sup> The terms “portion” and “percentage” will be used interchangeably in this study as the variables began as percentages and were only put into decimal form for ease of analysis and interpretation. As decimal form, these measures represent a portion of the city; thus, why both terms will be used.

H<sub>0</sub>: The number of female-headed household in a city will not affect the number of juvenile homicide offenders there are.

H<sub>3</sub>: Cities with greater numbers of female-headed-households will have more juvenile homicide offenders compared to cities with lower numbers of female-headed households.

H<sub>0</sub>: The portion of people receiving public assistance will not have an influence on the number of juvenile homicide offenders in a city.

H<sub>4</sub>: Cities with more people receiving public assistance will have more juvenile homicide offenders than cities with less people receiving public assistance.

H<sub>0</sub>: The portion of the city that is unemployed will not affect the number of juvenile homicide offenders.

H<sub>5</sub>: Cities with greater numbers of unemployed people will have higher numbers of juvenile homicide offenders.

H<sub>0</sub>: The proportion of owner-occupied housing in a city will not influence the number of juvenile homicide offenders.

H<sub>6</sub>: Cities with higher percentages of owner occupied-housing will have fewer juvenile homicide offenders than cities with less owner-occupied homes.

H<sub>0</sub>: The effect of the percentage of female-headed households on the number of juvenile homicide offenders will not vary based on the percentage of poverty in the city.

H7: Cities with lower percentages of people in poverty and higher percentages of female-headed households will have a decreased rate of juvenile homicide offenders.

H<sub>o</sub>. The relationship between the percentage of female-headed households and the rate of juvenile homicide offenders will not be moderated by the percentage of owner-occupied homes in a city.

H8: Cities with lower percentages of owner-occupied housing and higher percentages of female-headed households will have a decreased number of juvenile homicide offenders.

H<sub>o</sub>. The effect of the percentage of female-headed households on the rate of juvenile homicide offenders will not vary based on the percentage of those receiving public assistance in a city.

H9: Cities with lower percentages of public assistance and higher percentages of female-headed households will have a decreased number of juvenile homicide offenders.

H<sub>o</sub>. The rate of young adult homicide offenses will not influence the rate of juvenile homicide offenders in a city.

H10: Cities with an increased rate of adult homicide offenses will have an increased rate of juvenile homicide offenders.

## RESULTS

The sample statistics for this data, which were presented in the methods discussion of the specific variable, are summarized in Table 1. As noted, while the individual variables are included in this table for reference, the measures for owner-occupied housing, poverty, and public assistance are summed in a scale measuring family disorganization for some of the analyses. For further investigation of these independent variables, bivariate correlations are included between the dependent variable (number of juvenile homicide offenders) and each independent variable.

### Bivariate Analyses

As part of the initial analyses, correlations were calculated between the dependent variable, number of juvenile homicide offenders in each city per year, and each independent variable which can be seen in Table 2.

### Table 2: Bivariate Correlations, Juvenile Homicide Offenders, and Independent Variables

For Table 2, both the family disorganization scale as well as the variables which comprise it are included for reference and comparison. Significant, positive bivariate correlations are found between the number of juvenile homicide offenders and population ( $P = .397$ ,  $p < .001$ ), racial heterogeneity ( $P = .067$ ,  $p < .05$ ), unemployment ( $P = .088$ ,  $p < .001$ ), the young-adult homicide rate ( $P = .49$ ,  $p < .001$ ), and the family disorganization scale ( $P = .093$ ,  $p < .001$ ). Based on these results, we can propose that an increase in any one of these factors will also increase the

number of juvenile homicide offenders in a city. In contrast, the higher number of owner-occupied households ( $P = -.155$ ,  $p < .001$ ), the fewer juvenile homicide offenders in a city.

The strongest correlations are seen between the rate of juvenile homicide offenders and the rate of young adult homicide offenses as well as total population. Both population and the young adult homicide rate are moderate in strength and have a positive effect on the number of juvenile homicide offenders in the city. The correlations for unemployment and the family disorganization scale, while significant, are seen to have positive yet very small effects on the number of juvenile homicide offenders. Female-headed households ( $P = -.039$ ), poverty ( $P = .039$ ), and public assistance ( $P = .022$ ) were insignificant. Overall, the bivariate analyses allow an initial look at the relationships being tested here.

### Multivariate Analyses

Negative binomial regression, which is used to model count variables (particularly count variables with over-dispersed count outcomes), is the best method of analyses for this study as the dependent variable, number of juvenile homicide offenders, is a count variable with an over-dispersion of small numbers of homicide offenders. Negative binomial models assume that the conditional means are not equal to the conditional variance. This inequality is captured by estimating a dispersion parameter that is held constant in a Poisson model. A Poisson model is essentially nested in a negative binomial model and can be used to help test the model assumption. Several tests were conducted to ensure that negative binomial regression was the best fit for this data set and dependent variable.

While typically either the incidence rate ratio (exponentiated beta) or the beta is reported for negative binomial regression, both results will be included here for more detail and ease of interpretation. Additionally, an offset variable was included for each of the multivariate models to account for differences in city population size. Due to the inclusion of the offset variable, the incidence rate ratio for population is not interpretable; however, effect and effect size can be seen by the beta.

Table 3: Negative Binomial Regression, Juvenile Homicide and All Independent Variables

Table 3 provides further analyses of the relationships between the dependent and independent variables prior to including the family disorganization scale. Here a negative binomial regression equation was analyzed between the number of juvenile homicide offenders and all of the original independent variables: racial heterogeneity, unemployment, female-headed household, poverty, owner-occupied housing, and public assistance. Note that the rate of homicide among young adult offenders is not included here.

Population<sup>i</sup> (IRR: 1,  $\beta= 4.0E-7$ ,  $p<.001$ ) is found to be significant and positive suggesting that an increase in population increases the number of juvenile homicide offenders in a city. This must be interpreted cautiously, however, as this variable was used as the offset variable. The estimated rate ratio for a one unit increase in racial heterogeneity decreases the rate of juvenile homicide offenders by a factor of .934 ( $\beta= -.068$ ,  $p<.01$ ). The estimated rate ratio for a one unit increase in unemployment ( $\beta= 18.077$ ,  $p<.001$ ) increases the rate of juvenile homicide offenders in a city by a factor  $7.09E+8$ . Unlike previous findings in the literature, higher percentages of female-headed households are seen to decrease the rate of juvenile homicide offenders in a city.

In this model, the estimated rate ratio for a one unit increase in the percentage of female-headed households in a city is expected to decrease the number of juvenile homicide offenders by a factor of  $7.785E-5$  ( $\beta = -9.452$ ,  $p < .001$ ).

An increase in the percentage of public assistance in a city was found to increase the rate of juvenile homicide offenders by a factor of 141.271 ( $\beta = 4.951$ ,  $p < .05$ ). The estimated rate ratio for the percentage of owner-occupied housing explains that a one unit increase in this percentage is expected to decrease the rate of juvenile homicide offenders by a factor of .006 ( $\beta = -5.136$ ,  $p < .001$ ). Poverty (IRR= 1.317,  $\beta = .276$ ) was found to be insignificant suggesting that percentage of poverty is not a significant predictor of the number of juvenile homicide offenders in this model. The intercept is significant (IRR=  $6.29E-5$ ,  $p < .001$ ) and, although not really interpretable in negative binomial regression, the pseudo  $R^2$  is .0398.

Table 4: Negative Binomial Regression Juvenile Homicide Offenders and Family Disorganization

This model is intended to explore the impact of family disorganization on the number of juvenile homicide offenders in the city. All of the variables in this model are found to be significant. Results from this model suggest that higher population (IRR= 1,  $\beta = -4.36E-6$ ,  $p < .001$ ) reduces the number of juvenile homicide offenders in a city. Again, this finding must be interpreted cautiously as this variable is used as the offset in this analyses. In this model, an increase in racial heterogeneity decreases the rate of juvenile homicide offenders in a city by a factor of .942 ( $\beta = -.059$ ,  $p < .01$ ). An increase in the percentage unemployment is found to increase the rate of juvenile homicide offenders in a city by a factor of 2052474 ( $\beta = 14.535$ ,  $p < .001$ ).

As seen in the previous table, an increase in the percentage of female-headed households is found to decrease the number of juvenile homicide offenders in a city. The estimated rate ratio for a one unit increase in the percentage of female-headed households is expected to decrease the rate of juvenile homicide offenders by a factor of  $1.61E-5$  ( $\beta = -11.036$ ,  $p < .001$ ). The family disorganization scale is significant and positive in this model suggesting that an increase in family disorganization in a city increases the rate of juvenile homicide offenders by a factor of  $1.332$  ( $\beta = .286$ ,  $p < .001$ ). The relationships unfolding here will be explored further in other models. It is noteworthy, however, that even when accounting for poverty, public assistance, and owner-occupied housing (family disorganization scale), higher numbers of female-headed households are seen to decrease the number of juvenile homicide offenders in a city. The intercept is significant ( $IRR = 1.33E-5$ ,  $p < .001$ ) and pseudo  $R^2$  is  $.0386$ .

Table 5: Negative Binomial Regression, Juvenile Homicide Offenders and Female-Headed Household Interactions

Results in this model provide more insight into the relationship between female-headed households and the number of juvenile homicide offenders in a city. With this unexpected finding that higher percentages of female-headed households decrease the rate of juvenile homicide offenders, interactions are included to assess how this relationship may be explained through poverty, public assistance, and owner-occupied housing. In this model, larger populations ( $IRR = 1$ ,  $\beta = 3.46E-7$ ,  $p < .001$ ) are seen to increase the rate of juvenile homicide offending while an increase in racial heterogeneity ( $IRR = .907$ ,  $\beta = -.097$ ,  $p < .001$ ) is seen to decrease the rate of juvenile homicide offenders in a city. A strong predictor seen throughout the analyses is the effect of higher percentages of unemployment in a city. For every unit increase in

the percentage of unemployment, the estimated rate ratio is expected to increase the rate of juvenile homicide offenders by a factor of  $5.18E+8$  ( $\beta= 20.066$ ,  $p<.001$ ).

In the main effects, the percentage of female-headed households (IRR=  $4.72E-4$ ,  $\beta= -7.657$ ) and the percentage in poverty (IRR=  $74441.62$ ,  $\beta= 11.218$ ) are not significant due to the significant interactions captured in this model. The percentage of owner-occupied homes is found to be significant in the main effects, suggesting that an increase in owner-occupied housing reflects a decrease in the rate of juvenile homicide offenders by a factor of  $2.62E-6$  ( $\beta= -12.853$ ,  $p<.001$ ) even when the percentage of female-headed households is decreasing. Furthermore, the percentage of public assistance was also significant in the main effects which explains that an increase in the percentage of public assistance increases the rate of juvenile homicide offenders by a factor of  $5.35E+10$  ( $\beta=24.703$ ,  $p<.001$ ) when the percentage of female-headed households is decreasing.

All of the interactions were significant indicating that the relationship between the percentage of female-headed households and the number of juvenile homicide offenders is moderated by poverty, public assistance, and owner-occupied housing in a city. The first interaction is between female-headed households and poverty, which explains that as the percentage of female-headed households increase and the percentage of poverty decreases, there is an overall decrease in the rate of juvenile homicide offenders by a factor of  $1.53E-25$  ( $\beta= -57.137$ ,  $p<.05$ ). Similar findings are found with the interaction between female-headed households and public assistance; however, the significance of this interaction term is a little stronger than that between female-headed households and poverty. Based on the results, an increase in the percentage of female-headed households paired with a decrease in the percentage

of public assistance is seen to decrease the rate of juvenile homicide offenders by a factor of  $1.04E-34$  ( $\beta = -78.245$ ,  $p < .01$ ).

Unlike other findings in this study, the interaction between female-headed households and owner-occupied housing shows a different story for cities with higher percentages of female-headed households. Based on this interaction, as the percentage of female-headed households increase and the percentage of owner-occupied housing decreases, the estimated rate ratio is expected to increase the rate of juvenile homicide offenders in a city by a factor of  $6.32E+13$  ( $\beta = 31.778$ ,  $p < .05$ ). By including the interactions terms, the analyses gives a better picture of the relationship between female-headed households in a city and the number of juvenile homicide offenders. While the percentage of female-headed households is seen throughout to have a dampening effect on the rate of juvenile homicide offenders in a city, this does not appear the same in areas with lower percentages of owner-occupied housing. These results coincide with the points that Elliott and Merrill (1961) made regarding family disorganization and the importance family stability. Furthermore, the intercept for this model was significant ( $IRR = 7.54E-5$ ,  $p < .001$ ) and pseudo  $R^2$  is .0513.

Table 6: Binomial Regression, Juvenile Homicide Offenders and the Young Adult Homicide Rate

The data presented here focus on juveniles and homicide patterns amongst juvenile offenders. Research, however, has looked at the links and contrasts between adult and juvenile homicide offending. To capture a bit of that comparison here, Table 6 shows the results after including a rate for homicide offending among young adult offenders (18-24 years of age). In this model, findings suggest that a one unit increase in racial heterogeneity in a city increases the

rate of juvenile homicide offenders by a factor of 1.063 ( $\beta = .061$ ,  $p < .01$ ). As seen in all other models, the estimated rate ratio for the percentage of unemployed is expected to increase the rate of juvenile homicide offenders by a factor of 2589.799 ( $\beta = 7.859$ ,  $p < .001$ ). Furthermore, the percentage of female-headed households is significant and negative in this model suggesting that an increase in the percentage of female-headed households is expected to decrease the rate of juvenile homicide offenders in a city by a factor of  $1.95E-4$  ( $\beta = -8.544$ ,  $p < .001$ ). As hypothesized, the young adult homicide rate ( $\beta = .022$ ,  $p < .001$ ) is seen to increase the number of juvenile homicide offenders in a city. For every one unit increase in the rate of young adult homicide offenses, the estimated rate ratio of juvenile homicide offenders increases by a factor of 1.022. The intercept for this model is significant (IRR:  $3.13E-6$ ,  $p < .001$ ) and the pseudo  $R^2$  is .0774.

These findings, overall, suggest that cities with higher levels of racial heterogeneity, increased percentages of unemployed, and higher rates of homicide by young adults are seen to have an increased number of juvenile homicide offenders. As in other models, an increase in the percentage of female-headed households is seen to decrease the rate of juvenile homicide offenders even after accounting for the young adult homicide offense rate.

## CONCLUSION

Studying juveniles is not an easy task, particularly in a changing world that continues to shape and reshape our youth. Understanding how and why certain factors contribute to the number of juvenile homicide offenders in an area is just as important to our communities as it is the families supporting our youth. Research on this topic is important both for preventative as well as outreach efforts to youth and their families. The findings presented herein merely provide a stepping stone in the direction of more research.

Most of the hypotheses were supported by the analyses but there are mixed results in some cases. Of the ten hypotheses, seven were supported including the hypotheses for unemployment, poverty, owner-occupied housing, public assistance, the interaction between female-headed households and poverty, the interaction between female-headed household and public assistance, and the hypothesis for young adult homicide rates. The three hypotheses that were not supported or had mixed results include those for racial heterogeneity, female-headed households, and the interaction between female-headed households and owner-occupied housing. Instead of having a hypothesized positive effect, racial heterogeneity was seen to have a negative effect in all but one instance. Furthermore, female-headed households were hypothesized to have a positive effect on the rate of juvenile homicide offenders as well; however, this was only the case once. The interaction between female-headed households and owner-occupied housing showed an increase in this rate in areas with higher percentages of female-headed households and lower percentages of owner-occupied housing.

Overall this paper shows racial heterogeneity to have a negative effect on the number of juvenile homicide offenders in a city. There was only one instance that racial heterogeneity had a positive effect on the number of juvenile homicide offenders, as hypothesized, and that was in the model with young adult homicide rates. Future research is needed to untangle this relationship. The measure used in this study may need to be revised. Overall, it is possible that the impact of racial heterogeneity is moderated by age and this is why the results are contradictory to the hypothesis (Light & Harris, 2012; Carson & Esbensen, 2014).

The percentage of unemployment had the hypothesized influence on the rate of juvenile homicide offenders in a city. Unemployment serves as a strong, consistent, and positive predictor in this study suggesting that the effects of unemployment in a city can be felt both at the societal and family-level. Furthermore, the percentage of owner-occupied housing was seen throughout the study to be a strong, consistent, and negative predictor of the number of juvenile homicide offenders. These findings suggest that cities with higher percentages of owner-occupied housing have decreased rates of juvenile homicide offenders. This finding also can be applied to what Elliott and Merrill (1961) discussed regarding the stability of the family.

Alone, neither poverty nor the public assistance measure was found to be strong a predictor; however, both played a role in explaining the effect of female-headed households. While poverty was an insignificant predictor throughout, the percentage of public assistance was a significant predictor in tables 3 and 5. Overall, higher percentages of public assistance in a city is expected to increase the rate of juvenile homicide offenders in a city. Some interesting findings were uncovered with regard to the percentage of female-headed households as well as the interactions included for this measure.

In the discussion of family disorganization and juveniles, it is important to consider what intimate factors may have an influence. The rate of young adult homicide offenses not only gives insight to the crime level and criminal opportunity in the city, but also the influence that criminal peers and older siblings may have. As hypothesized, an increase in the rate of young adult homicide offenders in a city is shown to produce an increase in the rate of juvenile homicide offenders in the city. Having higher rates of young adult homicide offenses in an area could have damaging effects at both the societal and family-level thus. This factor should be considered in future research of juvenile homicide offenders.

Many of the conclusions here are supportive of prior research. One finding stands out, that between the number of juvenile homicide offenders and the number of female-headed households in a city. Unexpectedly, the percentage of female-headed households in a city are seen to reduce the number of juvenile homicide offenders overall. With a closer look at this variable through the use of interaction terms, results suggest that female-headed households have the potential to either decrease or increase the rate of juvenile homicide offenders in a city depending on the other circumstances at hand. The interaction results suggest that cities with higher percentages of female-headed households and lower percentages of poverty and public assistance will have a decreased rate of juvenile homicide offenders. Going back to the discussion that Elliott and Merrill (1961) provide on the importance of stability in the family when faced with measures of disruption, these results point to a dampening effect based on female-headed households in areas that are more stable and conducive to family-stability. On the flip side, the interaction between female-headed households and owner-occupied housing explain

that areas with decreased percentages of owner-occupied homes expect to see an increase in the number of juvenile homicide offenders.

Female-headed households that are not in situations of financial crisis or residential instability may serve a protective factor for juveniles and may have the power to reduce juvenile-perpetrated homicide in the right situations with the right tools. Since the literature has not addressed this finding for female-headed households, more investigation is needed to see if these results generalize before making firm conclusions. Female-headed households have been included as a measure of social disorganization, economic deprivation, and structural disadvantage throughout the history of literature in this area. Perhaps, this measure is no longer an effective one today in American cities. Instead of hypothesizing female-headed households to produce higher rates of crime and disadvantage as we have seen in the past, for the future, perhaps, this variable should be treated as a protective factor. Potentially, the results yielded in this study are reflective of stronger yet changed family units in American cities.

The results here both confirm and negate the prior findings in this area and point to a number of potentially changing and important trends in juvenile-perpetrated homicide in the United States. Protecting and promoting our youth to be the best that they can be is both advantageous to us as individuals and as a society. The results presented here are intended to both fill areas in this literature as well as instigate future research on these relationships as they are related to juvenile homicide offenders. Homicides perpetrated by juveniles are at a record low currently, but the longitudinal data on this phenomenon suggest that these numbers will likely rise again. Elliott and Merrill (1961) explained that while society is changing so is the family unit; it only seems plausible that our measures when looking at phenomenon such as

juvenile homicide will also change. As intended at the start of this investigation, the results yielded here provide a good start to future research on a deserving area.

### Limitations

Though the results from this study will likely prove to be useful and important to this area of research, there are some limitations that need to be noted. Although over 22 years of data are presented here, the data only extend through 2006. Ideally, instead of using total population as the offset variable, a count of juvenile population should be used to produce bigger and, perhaps, more meaningful coefficients in the results. One other limitation is that the data set does not include single male-headed households (only female). While there are certainly more single-female headed households than single male-headed households, the absence of this information makes it a limitation in this study. The data analyzed here do not include information regarding children in the household, which limits the comparison of family structure; however, this can be expanded in future research.

It should also be noted that the average percentage of the population receiving public assistance is low and the average percentage of owner-occupied households is high for this dataset. The average family in a city here is perhaps better off than the average city-dwelling family in the United States currently. As to be expected, future research is needed to confirm the generalizability of these findings and trends.

In terms of studying family disorganization, the variables used here are only able to capture so much due to the measures provided in the dataset. Future implications for investigation of family disorganization are discussed below. Finally, while disorganization at the

community-level was not the main focus in this study, population change may have provided a better measure of social disorganization at this level. The results yielded here provide a solid foundation for future research in this area to both dissect the relationships found here and confirm the generalizability of these findings as well.

### Future Research and Implications

While juvenile-perpetrated homicide is an area in need of further investigation on a multitude of levels, the findings presented here certainly call for further analyses. Particularly the unique, negative relationship seen between female-headed households and the number of juvenile homicide offenders in a city is not only interesting, but potentially telling of new trends to be seen. Future research should focus on the cohesiveness and morality of the family through variables measuring for divorce (both with children in the household and without), school dropout, family welfare intervention, parent criminal background, and specific family structure and number of supervising adults in the household. Information on the types of jobs, or perhaps type of work schedules, that the adults in a household (with children) would be helpful for looking at supervision and guidance of children outside of school hours.

Furthermore, information on youth programs such as afterschool programs and youth outreach programs offered and utilized in the community may be ideal for analyzing the intersection of individual, family, and community level disorganization. To understand youth who kill, understanding the families of these youth is crucial. Accordingly, any information regarding the family and the potential impact of disorganization on or in the family is helpful.

Future research is needed to expand the ideas and findings presented here as well as to investigate the potential new trends as seen in this study.

The results here imply that we need more female-headed households with stability and the proper resources as a means to reduce the number of juvenile homicide offenders in the city. Of course, promoting single-parent homes is not ideal, but this research can certainly aid in the prevention of problems associated with single-parent households. Furthermore, these findings could suggest the need for more female influence overall or, perhaps, less destructive or negative male influence. With future research, the implications of these results may become clearer, but it is possible that with females as the head of household that there is a different household dynamic. Potentially, in a female-headed household there is less access and learning of violence or other male-dominated socialization which would normally lead to more violent behavior among juveniles. Unemployment played a large role in the analyses as well suggesting that employment may be an important tool for reducing the number of juvenile homicide offenders in a city. Employment is critical to financial stability in a family and could act as a protective factor for teenagers with too much time and too little supervision, particularly. Overall, given these results, the suggestion here is certainly that our juveniles need stability—particularly residential stability-- and employment opportunities.

## **APPENDIX: TABLES**

Table 1: Sample Statistics

	N	Mean	Std. Dev.
<b>Dependent Variable</b>			
Juvenile Homicide Offenders	2093	4.47	25.40
<b>Independent Variables</b>			
Population	1985	553,178.37	901,340.22
Racial Heterogeneity	2093	.212	2.781
Unemployment	2093	.063	.025
Female-Headed Household	2093	.234	.08
Poverty	2093	.147	.053
Owner-Occupied Housing	2093	.501	.087
Public Assistance	2093	.075	.047
Young Adult Homicide Rate/100,000	2093	52.45	50.32
Family Organization Scale*	2093	.000	2.33
Range: -5.04 to 9.47			

Table 2: Bivariate Pearson Correlations, Juvenile Homicide Offenders and Independent Variables

Independent Variables	N	P
Population	1985	.397***
Racial Heterogeneity	2093	.067*
Unemployment	2093	.088***
Female-Headed Household	2093	-.039
Poverty*	2093	.039
Owner-Occupied Housing*	2093	-.155***
Public Assistance*	2093	.022
Young Adult Homicide Rate/100,000	2093	.49***
Family Organization Scale*	2093	.093***

\*\*\*p<.001, \*\*p<.01, \*p<.05

Table 3: Negative Binomial Regression, Number of Juvenile Homicide Offenders and All Independent Variables

Independent Variables	IRR	Standard Error	Confidence Interval	B
Population	1***	8.12E-8	1 to 1	4.00E-7
Racial Heterogeneity	.934**	.021	.895 to .976	-.068
Unemployment	7.09E+8***	2.38+8	99469.22 to 5.06E+10	18.077
Female-Headed Household	7.785E-5***	1.07E-4	5.39E-6 to .001	-9.452
Poverty	1.317	3.217	.011 to 157.738	.276
Owner-Occupied Housing	.006***	.006	.001 to .047	-5.136
Public Assistance	141.271*	306.79	2.002 to 9966.977	4.951
Intercept:	6.29E-5***			
Pseudo R <sup>2</sup> :	.0398			

\*\*\*p<.001, \*\*p<.01, \*p<.05

Table 4: Negative Binomial Regression with Family Disorganization Scale

Independent Variables	IRR	Standard Error	Confidence Intervals	B
Population	1***	7.83E-8	1 to 1	-4.36E-7
Racial Heterogeneity	.942**	.021	.903 to .984	-.059
Unemployment	2052474***	6152456	5764.108 to 7.31E+8	14.535
Female-Headed Household	1.61E-5***	1.97E-5	1.47E-6 to 1.77E-4	-11.036
Family Disorganization Scale	1.332***	.064	1.211 to 1.77E-4	.286
Intercept	1.33E-5***			
Pseudo R <sup>2</sup>	.0386			

\*\*\*p<.001, \*\*p<.01, \*p<.05

Table 5: Negative Binomial Regression, Basic Models with Female-Headed Household Interaction Terms

Independent Variables	IRR	Standard Error	Confidence Interval	B
Population	1	8.06E-8	1 to 1	3.46E-7
Racial Heterogeneity	.907***	.025	.859 to .958	-.097
Unemployment	5.18E+8***	1.71E+9	822433.5 to 3.27E+11	20.066
Female-Headed Household	4.72E-4	.004	7.43E-11 to 3005.183	-7.657
Poverty	74441.62	455924.1	.456 to 1.22E+10	11.218
Owner-Occupied Housing	2.62E-6***	8.64E-6	4.04E-9 to .002	-12.853
Public Assistance	5.35E+10***	3.76E+11	55980.87 to 5.11E+16	24.703
Female-Headed Household*Poverty	1.53E-25*	4.08E-24	3.42E-48 to .007	-57.137
Female-Headed Household*Owner-Occupied Housing	6.32E+13*	6.32E+13	1261.555 to 3.17E+24	31.778
Female-Headed Household*Public Assistance	1.04E-34**	2.69E-33	1.13E-56 9.61E-13	-78.245
Intercept	.0000754***			-9.492
Pseudo R <sup>2</sup>	.0513			

\*\*\*p<.001, \*\*p<.01, \*p<.05

Table 6: Negative Binomial Regression, Number of Juvenile Homicide Offenders with Young Adult Homicide Rate (18-24yrs old)

Independent Variables	IRR	Standard Error	Confidence Interval	B
Population	1	7.14E-8	1 to 1	7.49E-8
Racial Heterogeneity	1.063**	.025	1.015 to 1.113	.061
Unemployment	2589.779***	6331.82	21.485 to 312169.3	7.859
Female-Headed Household	1.95E-4***	1.72E-4	3.45E-4 to .001	-8.544
Young Adult Homicide Offense Rate (18-24yrs old)	1.022***	.002	1.019 to 1.025	.022
Intercept	3.13E-6***			
Pseudo R <sup>2</sup>	.0774			

\*\*\*p<.001, \*\*p<.01, \*p<.05

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<sup>i</sup> Population was used as the offset variable in this study. The offset variable accounts for differences in the population size from city to city, year to year. With this variable as the offset, the results must be interpreted by the beta and should be interpreted cautiously.