

OUT OF HOME PLACEMENT LOCATION AND JUVENILE DELINQUENCY: THE
INVESTIGATION OF NEIGHBORHOOD IMPACT ON CHILD WELFARE POPULATION'S
JUVENILE JUSTICE INVOLVEMENT

BY

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DISSERTATION

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ABSTRACT

The evidence to date is clear. Victims of child abuse and neglect are at an increased risk of juvenile delinquency. Yet little is known about the mechanisms responsible for this increased risk. This dissertation aims to advance the knowledge base by investigating whether the neighborhoods associated with foster care placement affect the risk of delinquent offending for adolescents in the child welfare system. This study tests the hypothesis whether the association between neighborhood sociodemographic factors and delinquency is mediated by neighborhood social processes. The hypothesis is based on social disorganization theory and social norm theory.

The sample was selected from the official child abuse and neglect records associated with the Illinois Department of Child and Family Services (IDCFS). All children were born in 1983 and 1984, were associated with at least one substantiated allegation of maltreatment, and were placed within the City of Chicago. The final sample was comprised of 2,360 children. Nearly ninety (89.58%) of the sample were African American, 3.22% were White, and 7.20% were Hispanic. Slightly less than half (47.92%) of the sample were male. The average age at the time of initial indicated maltreatment was 6.45 years old.

The design is longitudinal and involves the analysis of a unique data sharing agreement in a large metropolitan county. The study followed the placement experiences and delinquency petitions associated with the sample from birth through age 16. The study used data from IDCFS administrative data, Cook County juvenile court administrative data, the 1990 census, and the community survey of the Project of Human Development in Chicago Neighborhoods (PHDCN).

I started from visualizing spatial distribution of foster care placements in ArcGIS. I used exploratory spatial data analysis in GeoDa to measure spatial clustering of foster care placements. I compared the spatial clustering of foster care placements and the spatial clustering of

neighborhood sociodemographics. The results indicated that there are similarities between the spatial clustering of foster care placements and several neighborhood sociodemographics (e.g. percentage of below the poverty line).

I used path analysis to test the hypothesis that the neighborhoods associated with foster care placement affect the risk of delinquent offending for adolescents in the child welfare system, and the association between neighborhood sociodemographic factors (concentrated disadvantage, ethnic heterogeneity, residential stability) and delinquency is mediated by social disorganization (collective efficacy, neighborhood disorder) and social norms (violent culture). I also used a multiple subsamples approach to test the moderation effect of length in care. The findings partly supported my hypotheses. The results indicated that neighborhood sociodemographic factors have direct impacts on violent offenses. The results also indicated that neighborhood sociodemographic factors have indirect effects on drug offenses mediated by neighborhood disorder. In addition, neighborhood sociodemographic factors have indirect effects on property offenses mediated by collective efficacy for the subsample of over five years in care. More neighborhood variables were statistically significant for the subsample with longer time in care.

I provided research and practice implications based on these findings. Regarding research implications, I suggested that future study could study the effects of the surrounding neighborhoods on delinquency, should examine the moderation effects of kinship care, should include more diverse neighborhoods, and should consider using more advanced models to control selection bias. Regarding practice implications, I first suggested that caseworker should choose to place foster children in less disadvantaged neighborhoods, when they choose from foster care placements that are similar in all aspects except for neighborhood conditions. Meanwhile, caseworkers need to help foster youths with assimilation into new neighborhoods.

Second, I identified strategies to change collective efficacy and neighborhood disorder. I suggested using community justice to increase collective efficacy and using community policing to reduce neighborhood disorder. Third, I noted that neighborhood programs should remain in operation for a long time, the funding of which may be supported by community development.

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CHAPTER 1

STATEMENT OF THE PROBLEM

Problem

Victims of child maltreatment show a higher risk of juvenile delinquency than their peers (English, Widom, & Brandford, 2004; Ryan & Testa, 2005; Smith & Thornberry, 1995; Widom, 1989; Zingraff, Leiter, Myers, & Johnsen, 1993). For example, a study (English et al., 2004) reported that abused and neglected children were 11 times more likely to be arrested for a violent crime as a juvenile, as compared to the matched control group. In addition to first time offending, victims of child maltreatment show a higher risk of recidivism (Halemba, Siegel, Lord, & Zawacki, 2004; Huang, Ryan, & Herz, 2012; Ryan, 2006). Youth simultaneously receiving services from both child welfare and juvenile justice systems are referred to as dually-involved youth (Herz, Ryan, & Bilchik, 2010). A study in Arizona data (Halemba et al., 2004) reported that recidivism rates was 62% for dually-involved youth, which was more than doubled the recidivism rate (30%) for delinquency only cases. The increased delinquency rate is especially true for the victims placed out of home (Doyle, 2007; Ryan & Testa, 2005). Some victims of child abuse and neglect remain out of home for a long time, and adapt to the culture of the neighborhoods associated with their placement. However, no study has examined the effect of neighborhood on delinquency among the child welfare population.

Purpose

This study aims to advance the knowledge base by investigating whether the neighborhoods associated with foster care placement affect the risk of delinquent offending for adolescents in the child welfare system. This study presents the spatial distribution of placements, investigated neighborhood effects on delinquency, and examined the moderation

effect of length in care. This study is important because the findings can help the child welfare systems think about optimal placements in an effort to prevent juvenile offending.

CHAPTER 2

LITERATURE REVIEW AND RESEARCH QUESTIONS

Child maltreatment refers to child abuse and neglect. It is defined as “any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse and exploitation; or an act or failure to act, which presents an imminent risk of serious harm.” (Child Abuse Prevention and Treatment Act Reauthorization of 2010, U.S. Public Law 111-320). There are four types of maltreatment, neglect, physical abuse, psychological maltreatment, and sexual abuse. In 2010, 695,000 children were found to be victims of child maltreatment, which translates into 9.2 victims per 1,000 children in the population (U.S. Department of Health and Human Services, 2011). Victims of child maltreatment experience long-term negative outcomes, including impaired brain development, poor physical health, poor mental and emotional health, cognitive difficulties, social difficulties, sexual risk-taking, juvenile delinquency, adult criminality, alcohol and other drug abuse, and abusive behaviors towards their own children (Child Welfare Information Gateway, 2008). This paper will focus on outcome pertaining to juvenile delinquency.

Juvenile delinquency is defined as participation in illegal behavior by a minor who is between the age of 10 and the upper age of jurisdiction, which is the oldest age at which a juvenile court has original jurisdiction over an individual for law-violating behavior. (Puzzanchera, Adams, & Sickmund, 2011). The upper age of jurisdiction ranges from 15 to 17, varying by states. In Illinois, the upper age of jurisdiction is 16. Juvenile offenses are grouped under five categories, namely: crimes against persons, crimes against property, drug law violations, offenses against public order (e.g. weapon offenses), and status offense (Puzzanchera, Adams, & Sickmund, 2011). Status offense refers to behavior that is considered an offense only

when committed by a juvenile (e.g. running away from home). Victims of child maltreatment show a higher risk of juvenile delinquency.

An increasing number of studies have examined the relationship between child maltreatment and juvenile delinquency. To review existing literature in this area, I will start by introducing the theories that explain the mechanisms in the maltreatment-delinquency relationship. I will then review the empirical studies in this area. I will organize the empirical studies in accordance with the sequence of events that happen during juvenile justice process, including initial involvement, processing, and recidivism. I will then narrow my review to the victims who receive child welfare services. Not all victims receive child welfare services. Among victims of child maltreatment, 61.2% of them received post response child welfare services, and 36% received out-of-home placement services, which are considered more intensive than in-home services (U.S. Department of Health and Human Services, 2011). My review on dually-involved youth will examine whether out-of-home placement services and the specific characteristics of placement influence their likelihood of involvement in the juvenile justice system. I will also review the covariates affecting the maltreatment-delinquency relationship, including age, gender, race/ethnicity, maltreatment type, and neighborhood.

My review finds that there are few studies on neighborhood influences, which echoes other researchers' calls for more research on how neighborhoods may influence children and youth's well-being (Berrick, 2006; Crampton, 2007). These calls occurred during the debate on location based placement criteria (Berrick, 2006; Crampton, 2007): that is, whether placement criteria should favor better neighborhoods (e.g. neighborhoods with low poverty rates) over closer neighborhoods (i.e. the neighborhood surrounding their parents' home or at least close to their parents' home). One way to resolve the debate is to examine how neighborhoods influence

juvenile delinquency. For example, if children placed in better neighborhoods have lower rates of juvenile delinquency than those placed in closer neighborhoods, better neighborhoods should be one additional and important factor to consider. Even though few studies on maltreated children examined neighborhood effects, many studies on general populations reported on the effects of neighborhood on juvenile delinquency. To inform my study on maltreated children, I will review the related empirical studies on children in the general population, examine pertinent theories, and review neighborhood-based delinquency intervention. I conclude by summarizing the gaps in current knowledge and generate research questions for the future.

Child Welfare and Juvenile Delinquency

Child maltreatment and juvenile delinquency

Theories on the maltreatment-delinquency relationship

Three theories, including social control theory, social learning theory, and social strain theory, explain mechanisms in the maltreatment-delinquency relationship. Social control theory indicates that an individual's ties to conventional institutions such as family and school inhibit their disposition toward deviance (Hirschi, 1969). Individuals without such ties are not concerned about jeopardizing cherished relationships, and therefore experience greater freedom to engage in deviance. Victims of child maltreatment are less likely to form close ties and attachments to others (Sampson & Laub, 1993). This poor attachment results in few restraints on delinquency. Therefore, they are more likely to engage in delinquent behaviors. Social learning theory indicates that individuals who learn the motives, drives, rationalization, and attitudes favorable to the violations of laws are likely to exhibit criminal/delinquent behaviors (Sutherland, 1947). Caregivers who maltreat children demonstrate the models of deviant or aggressive behavior, and implicitly teach children that such behavior is acceptable and may be even

desirable. Through modeling, imitation, and reinforcement, victims of child maltreatment learn and adopt the behaviors displayed by their caregivers and become delinquent (Paperny & Deisher, 1983). Social strain theory indicates that individuals who receive negative treatment from others (strain) experience negative emotions, such as anger, frustration, and resentment. Negative emotions lead to corrective action. People sometimes use criminal/delinquent behaviors as corrective action to satisfy desires for revenge and alleviate their feelings of anger and resentment (Agnew, 1992). Victims of child maltreatment, particular adolescents, experience strong feelings of anger and resentment after maltreatment. They are likely to behave in criminal/delinquent ways in order to alleviate their feelings of anger (Ireland, Smith, & Thornberry, 2002; Thornberry, Ireland, & Smith, 2001).

Child maltreatment and juvenile justice involvement

Empirical studies using different samples and measurements have consistently documented the maltreatment-delinquency relationship (English, Widom, & Brandford, 2002; Fang & Corso, 2007; Hussey, Chang, & Kotch, 2006; Ryan & Testa, 2005; Smith & Thornberry, 1995; Widom, 1989; Zingraff, Leiter, Myers, & Johnsen, 1993). As a pioneer in this area, Widom (1989) compared delinquency rates between a sample of maltreated children ($N = 908$) and matched controls ($N = 667$) from a metropolitan area in the Midwest. The match was based on sex, age, race, and approximate socioeconomic status of the families. The author used official records to measure both maltreatment and juvenile delinquency/adult criminal behavior. The author reported that 26% of maltreated children had juvenile delinquency records as compared with 16.8% of matched controls. The difference was statistically significant. It is worth noting that this study has limited generalizability to today's circumstances, more than 20 years later. Widom (1989) identified maltreated children through juvenile court records between 1967 and

1971, which was before the mandatory reporting policy (Child Abuse Prevention and Treatment Act, U.S. Public Law 93-247) was in effect. Before the mandatory reporting policy was in place, only severe maltreatment cases received attention from public. It is likely that the maltreated children in Widom's sample (1989) experienced severe maltreatment. In a replicate study, the authors (English et al., 2002) selected a sample of maltreated children ($N = 877$) and matched controls ($N = 877$) from a large urban area in the state of Washington. The replicate study represents a different geographic area, a different time period (i.e. mandatory reporting policy became in effect), and a different ethnic composition (i.e. including Native Americans). The authors reported that 19.6% of maltreated children had juvenile delinquency records as compared with 4.1% of the matched controls. Again, the difference was statistically significant.

Unlike Widom's studies, most studies measured child maltreatment through Child Protective Service (CPS) records rather than through court records. Since CPS handles the majority of child maltreatment cases without involving courts, using CPS records enhanced the generalizability of their findings. Zingraff and colleagues (1993) compared maltreated children ($N = 633$) with two control groups, school children in general ($N = 281$) and impoverished children ($N = 177$). The sample was selected from Mecklenburg County, North Carolina. The authors reported that delinquency rates were 13.7% among maltreated cases, 5.3% among school children, and 9.0% among impoverished children. Regarding specific offense type, the logistic regression model showed that maltreated children had higher risk of delinquency in general as well as higher risk of status offenses than the other two groups. A more recent study (Ryan & Testa, 2005) using official records, compared delinquency rates of maltreated children and non-maltreated children from Cook County, Illinois. The authors reported that between 1995 and 2000, delinquency rates of maltreated children were 47% higher than for non-maltreated children.

Other studies included self-reports for delinquency measurements. As compared with official records of delinquency, researchers (Smith & Thornberry, 1995) argued that self-reports were less impacted by reporting bias, which means that maltreated children's delinquencies were more likely to be known to law enforcement due to their contact with public agencies. Smith and Thornberry (1995) used the data from the Rochester Youth Development Study (RYDS), which studied a sample of maltreated children ($N = 136$) and non-maltreated children ($N = 864$). The author used official records to measure both maltreatment and juvenile delinquency. In addition, the authors also used a 32-item self-report inventory to measure delinquency. The authors reported that 45.1% of maltreated children and 31.7% of non-maltreated children had official records of delinquency; 78.8% of maltreated children and 69.8% of non-maltreated children had self-reports of delinquency. The positive association between maltreatment experiences and delinquency still held true with control of demographics (i.e. gender, race, underclass status, family structure, and mobility).

Two studies also used self-reports as maltreatment measurements. Hussey and colleagues (2006) studied a sample of 15,197 young adults from the National Longitudinal Study of Adolescent Health (Add Health). They measured child maltreatment through retrospective self-reports, and also measured adolescent violent behaviors through self-reports. The results from the binary logistic regression showed that all types of maltreatment increased the likelihood of violent behavior. Another study (Fang & Corso, 2007) using the same data (Add health) also found that neglect and physical abuse were positively associated with the likelihood of violent behaviors, while sexual abuse was not significant. Running bivariate probit models for male and female samples separately, the authors also reported that neglect and physical abuse increased violent behaviors of males more than females.

Child maltreatment and juvenile justice processing

Although limited in scope, there are a few studies that focused on experiences in the juvenile justice system after arrest (Conger & Ross, 2001; Ryan, Herz, Hernandez, & Marshall, 2007). In general, these studies identified a bias against dually-involved youth (i.e. youth that are simultaneously receiving services from both the child welfare and juvenile justice systems) in juvenile justice processing. Dually-involved youth were more likely to receive detention (Conger & Ross, 2001) and be incarcerated (Ryan et al., 2007). Conger and Ross (2001) identified the foster care bias in detention decisions. The study used administrative data from juvenile justice and child welfare agencies in New York City. The authors reported that after arrest, the probability of detention for youth in foster care was ten percent higher than the probability for youth not in foster care. The authors were concerned that detention could cause education/employment disruption and even placement disruption for youth in foster care. Ryan and colleagues (2007) investigated the relationship between child welfare status and disposition outcomes. The sample included all first time juvenile offenders between 2002 and 2005 ($N = 69,009$) in Los Angeles County, California. Seven percent ($N = 4,811$) of the sample were dually-involved youth. To reduce selection bias, the authors used propensity score matching to match dually-involved youth and non-child welfare youth on race, gender, type of offense, age at first arrest, and number of charges at first arrest. The authors reported that dually-involved youth were more likely to receive dispositions that moved them into group homes, delinquency camps or the California Youth Authority (CYA), while less likely to receive probation.

System-based factors, which are referred to as difficulties that occur when implementing procedures, contribute to the bias. Staff members in the juvenile justice system usually find it

harder to connect with the caseworkers of dually-involved youth than to connect with the parents of other delinquents. For example, police officers have difficulty getting the contact information of caseworkers, and dually-involved youth often failed to provide such information. When law enforcement cannot connect with caseworkers who can perform the function of legal guardian, they are more likely to place dually-involved youth in detention (Conger & Ross, 2001).

Additionally, perceiving child welfare placements as less stable than biological homes of other delinquents, staff members in the juvenile justice system may not trust the supervision provided by child welfare placement. Therefore, they may be less likely to dismiss dually-involved youth or assign them to probation. I think that coordinating the juvenile justice and the child welfare systems might help to reduce the bias. The coordination can start from cross-sectional training. As staff in the juvenile justice system learn more about the consequences of child maltreatment, and understand which services are provided by the child welfare system, they can better evaluate the safety of returning dually-involved youth to their placement within the child welfare system; similarly, as staff in the child welfare system learn more about the operation of the juvenile justice system, they are more likely to understand the importance of representing the best interest of their clients when dealing with the juvenile justice system.

Child maltreatment and recidivism

Several administrative data analysis studies have consistently reported that child maltreatment increased the risk of recidivism (Halemba, Siegel, Lord, & Zawacki, 2004; Huang, Ryan, & Herz, 2012; Wiebush, Freitag, & Baird, 2001). The National Council on Crime and Delinquency (NCCD) (Wiebush et al., 2001) investigated recidivism risk factors among juvenile probationers and parolees. Based on administrative data from several states (i.e. Michigan, Nebraska, Rhode Island, Virginia, and Wisconsin), findings indicated that child maltreatment

was an important risk factor for continuing delinquency. For example, the statistics from Rhode Island showed that juvenile probationers of maltreatment experiences committed crime again at more than 1.5 times the rate of youth without maltreatment experiences (71% versus 46%). A study on Arizona administrative data (Halemba et al., 2004) reported the recidivism rate as 62% for dually-involved youth, which was more than double the recidivism rate (30%) for delinquency only cases. Similarly, a recent study (Huang et al., 2012) using administrative data from Los Angeles County reported that the recidivism rate for dually-involved youth was higher than the recidivism rate for delinquency only cases (56% versus 41%).

The finding from multivariate analysis also showed that child maltreatment increased the risk of recidivism. Ryan (2006) studied a sample of youth released from a large residential program in the Midwest between 1992 and 1993 ($N = 286$). The author reported that 26% ($N = 75$) of the sample had at least one prior substantiated allegation of maltreatment. With control of individual-level and cottage-level variables in the HLM model, the author showed that the odds ratio for recidivism increased by 1.62 for youth with a prior substantiated report of maltreatment.

Higher incarceration rates among dually-involved youth contribute to their higher recidivism rates. As mentioned earlier, dually-involved youth are more likely to be incarcerated than youth without child welfare backgrounds (Ryan et al., 2007). During incarceration, living in the restrictive setting increases the risk of peer contagion. That is, association with deviant peers in group settings escalates problem behavior among youth (Dishion, McCord, Poulin, 1999). To understand the relationship between child maltreatment and recidivism, it is also important to examine how the child welfare system intervenes with delinquent wards released from juvenile justice placements. It is possible that the child welfare system move dually-

involved youth from family-like settings, such as foster homes, to congregate care, such as residential care or group homes. Congregate care features high security facilities. However, similar to the restrictive settings for incarceration, congregate care in the child welfare system might also increase the risk of peer contagion. Moreover, the policies in congregate care might also impact delinquency. First, congregate care requires and enforces more rules. Some youths struggle to follow the rules (Hyde & Kammerer, 2009). When they break the rules, especially the major rules such as runaway, they are likely to be reported to law enforcement. Second, congregate care provides intensive supervision. Staff members in congregate care are likely to report deviant behaviors to law enforcement system. Biological parents usually do not call the police for youth's minor deviant behaviors such as stealing and fighting, but staff members in congregate care call the police about such behaviors (Conger & Ross, 2001). They also call the police when youths act out, which could have been handled informally (Herz, Lee, Lutz, Stewart, Tuell, & Wiig, 2012). Therefore, the new deviant behaviors of dually-involved youth are more likely to gain attention from the juvenile justice system, which results in a new delinquency charge.

Child welfare placement and juvenile delinquency

Although victims of child maltreatment showed higher rates of juvenile delinquency than the general youth population, most victims were not involved in the juvenile justice system. Certain life experiences may limit the consequences commonly associated with maltreatment. One of the experiences is child welfare services. Many victims of child maltreatment receive child welfare services. According to national statistics, 61.2% of victims received postresponse child welfare services and 36% received out of home placement services (U.S. Department of Health and Human Services, 2011). Postresponse services include both in-home services and out

of home services. In-home services include all services provided to families except foster care or removal from the home. In-home services may be provided directly in the home or in a professional setting. Out of home placement services provide twenty-four-hour substitute care for children placed away from their parents or guardians and for whom the State Agency has placement and care responsibility. This includes family foster homes, foster homes of relatives, group homes, emergency shelters, residential facilities, childcare institutions, and pre-adoptive homes. These services intend to fulfill three goals: safety, permanence, and child well-being (Children and Family Research Center, 2011). Delinquency is one of the most studied indicators of child well-being (Doyle, 2007; Jonson-Reid, 2002; Jonson-Reid & Barth, 2000a; Lemmon, 2006; Leitenberg, Burchard, Healy, & Fuller, 1981; Runyan & Gould, 1985; Ryan & Testa, 2005; Widom, 1991). Most attention is focused on whether placing children out of home impacts their risk of delinquency.

Placement in general

Measurement strategies vary in the study of child welfare juvenile justice contacts. Justice system involvement might refer to informal police contact, formal arrest records, adjudications, self-reports, or incarcerations. Consequently, findings are often mixed. Widom (1991) showed that out-of-home placement was not associated with delinquency rates. The author reported that delinquency arrests occurred among 15.1% of maltreated children never placed, 17.8% of maltreated children whose placement was related only to maltreatment, and 92.7% of children placed due to both delinquent behavior and maltreatment. It appeared that maltreated children never placed and those whose placement was related only to maltreatment had similar risks of arrest, and that these youth had much lower risks as compared with children placed due to both delinquent behavior and maltreatment.

With regard to mixed findings, some authors reported that placement might actually help reduce the risk of juvenile justice involvement. Leitenberg and colleagues (1981) compared police contacts among 187 children in Vermont state custody over three years. The authors reported that police contacts were significantly lower for children living in out-of-home placement (foster home and group home) as compared with children remaining with their parents.

Using large-scale samples from administrative data, Jonson-Reid and Barth reported similar findings. Jonson-Reid and Barth (2000a) analyzed administrative data of 159,549 maltreated children in ten counties in California. The authors reported that the provision of child welfare services, including in-home and foster placement, did not change the risk of incarceration for White children. However, for African American ($OR = .52, p < .01$) and Hispanic children ($OR = .58, p < .05$), the receipt of child welfare services significantly decreased the risk of incarceration. Utilizing a sample of 36,653 maltreated children in Missouri, Jonson-Reid (2002) conducted another study to examine in-home and foster/group care separately. The author reported similar findings that both in-home ($OR = .54, p < .01$) and foster/group care ($OR = .35, p < .05$) reduced the risk of incarceration for African American and Hispanic children. The two studies above used incarceration as a delinquency measure, which captured the most serious offenders. Similarly, using administrative data of a cohort ($N = 632$) receiving financial supports or other services from the Pennsylvania Department of Public Welfare's Office of Income Maintenance, Lemmon (2006) reported that having a child welfare placement reduced the odds of a delinquency referral ($OR = .25, p < .001$). Moreover, the author also found that placement reduced the continuation and severity of delinquency.

In contrast, other authors reported the deleterious effects of placement experiences. Runyan and Gould (1985) examined the effects of foster care on juvenile delinquency using a

historical cohort design. The authors used administrative data from six central North Carolina counties. One hundred fourteen foster children were compared with 106 victims of maltreatment who remained with parents. The authors reported no statistical difference in overall crime rates between the two groups. However, the number of foster home placements was correlated with an increased risk of delinquency. Using administrative data from Cook County, Illinois, Ryan and Testa (2005) investigated the relationship between placement, placement instability, and juvenile delinquency. Studying male and female samples separately, their findings indicated that children in placement were at an increased risk of delinquency (male subsample, $OR=1.89, p < .001$; female subsample, $OR=2.11, p < .001$) as compared with children not entering placement. Using similar administrative data from Illinois, Doyle (2007) reported that children on the margin of placement achieved better outcomes when they remained at home as compared with children removed from the biological family. Specifically, Doyle concluded that children removed from home had significantly higher delinquency rates and higher teen birth rates.

Placement characteristics

The mixed findings about the effect of placement on delinquency make it unclear whether children will be better off if they are placed out of home. What adds to the confusion is how to serve children who are placed out of home. The child welfare system offers a variety of placement types, such as nonrelative foster care, kinship care, and congregate care. Due to a variety of reasons, the child welfare system sometimes changes children's placement (James, 2004). It is therefore important to examine how placement types and placement changes impact delinquency.

To examine the impact of placement types and placement changes, researchers usually limited their samples to children placed out of home (36% of victims are placed out of home).

Many studies concluded that placement instability increased the risk of delinquency (Baskin & Sommers, 2011; Jonson-Reid & Barth, 2000b; Jonson-Reid & Barth, 2003; Rubin, O'Reilly, Luan, & Localio, 2007; Ryan & Testa, 2005). Jonson-Reid and Barth (2000b) studied a sample of 79,139 children in out-of-home placement in California. They found that multiple placements, multiple spells in care, and the experience of probation foster care increased the risk of incarceration. Moreover, their finding on multiple spells in care highlighted that returning children of color to their homes might expose them to high crime neighborhoods, and therefore increase their risk of delinquency involvement. In their next study, Jonson-Reid and Barth (2003) treated probation foster care as a dependent variable. Probation foster care is the placement that juvenile probation departments use as a sentencing option for youths who committed a crime that is serious enough to handle formally but does not warrant a more restrictive placement in a juvenile detention facility (Jonson-Reid & Barth, 2003). The sample consisted of 33,929 foster children in California. Consistent with their previous finding, multiple placements during the first spell and multiple spells in care were found to increase the risk of a transition to probation foster care. A longer period during the first spell decreased the risk of probation foster care. Since spells usually ended with returning children to their homes (reunification), their finding suggested that careful decisions are needed for successful reunification. Otherwise, speeding up reunification without necessary supports can increase the risk of probation foster care.

Studies of other places reported similar findings. Studying a sample from Cook County, Ryan and Testa (2005) also found that placement instability increased the risk of delinquency among males. As compared with males who had experienced one placement, the odds ratio of involving in delinquency was 1.54 times higher for males with three placements, and 2.13 times higher for males with four or more placements. However, the authors did not find that placement

instability increased the risk of delinquency among females. Recently, Baskin and Sommers (2011) conducted a similar study using administrative data from Los Angeles County. The authors reported that placement changes increased the likelihood of being arrested (*odds ratio* = 2.27, $p < .001$) and being charged by the district attorney (*odds ratio* = 1.90, $p < .001$).

A study of a national sample also found that placement instability was positively associated with behavior problems. Rubin and colleagues (2007) studied a sample of 729 foster children from the National Survey of Child and Adolescent Well-being (NSCAW). The authors measured the placement instability over the first 18 months in out-of-home care, and grouped children into three levels of placement instability, namely: early stable (stable placement within 45 days), late stable (stable placement beyond 45 days), and unstable (never achieving stability). The authors measured behavioral problems using the Child Behavior Checklist (CBCL) caregiver-reported survey, and created a dummy variable for behavioral problems, i.e., normal ($<83^{\text{rd}}$ percentile) and abnormal ($\geq 83^{\text{rd}}$ percentile). The authors reported that 31% of early stable, 38% of late stable, and 51% of unstable children had abnormal behavioral outcomes after 18 months. The difference was statistically significant. Their finding indicated that both children who achieved stability later and children who did not achieve stability had higher rates of abnormal behavioral outcomes than children who achieved stability early.

The relationship between placement instability and delinquency may be explained by social attachment theory. Children who experience multiple placement disruptions may not have the experience staying with the same caregivers for a long time. Without sufficient time for bonding, they may be unlikely to develop strong attachments with caregivers. Their poor attachments may result in few restraints on delinquency. As they are not concerned that

delinquency can jeopardize cherished relationships, they may experience greater freedom to engage in deviances and present more problematic behaviors.

Another placement characteristic that predicts delinquency outcome is placement type. Similar to findings from criminal justice studies (Dishion et al., 1999), child welfare researchers also have found that congregate care, such as group homes, increased the risk of delinquency (Jonson-Reid & Barth, 2003; Ryan, Marshall, Herz, & Hernandez, 2008). Using probation foster care as a dependent variable, Jonson-Reid and Barth (2003) reported that a primary placement in foster or kinship care was associated with lower risks of entering probation foster care than placement in a group home. Using a sample of 20,309 children with at least one placement episode from Los Angeles County, Ryan and colleagues (2008) compared the delinquency outcome between group home and foster care children. To reduce selection bias, the authors used propensity score matching. The authors included the variables race, gender, maltreatment type, reason for placement change (i.e. runaway and behavior problems), age at first placement, length of stay in placement, and total changes in placement in the matching. After the matching, the results from cox regression showed that the odds ratio of delinquency outcome for children with at least one group home episode was 2.40 times greater than for children in foster care. The authors suggested peer contagion and group home policies pertaining to contacting law enforcement might contribute the higher risk of delinquency.

Findings on the relationship between kinship care and delinquency have been mixed (Rubin et al., 2008; Ryan, Hong, Herz, & Hernandez, 2010). Using a national sample of 1,309 children placed in out-of-home care from NSCAW, Rubin and colleagues (2008) found that kinship care reduced the risk of behavioral problems. Depending on the timing of entering kinship care, the authors grouped children into three types of placement, early kinship care

(kinship care within 1 month), late kinship care (kinship care beyond 1 month), and general foster care (never in kinship care). The authors reported abnormal behavioral outcomes among 32% of early kinship care, 39% of late kinship care, and 46% of general foster care children after 36 months ($p < .01$). The authors therefore concluded that kinship care reduced the risk of behavioral problems. However, Barth (2008) suggested that the relationship between kinship care and better behavioral outcomes may be limited by measuring behavioral problems reported by caregivers, since relatives may be less likely to report problematic behaviors than foster parents. More recently, Ryan and colleagues (2010) studied the relationship between kinship care and juvenile delinquency. To reduce selection bias, the authors used propensity score matching to match kinship care children and foster care children on age at first placement, race/ethnicity, gender, and maltreatment type. Their finding was that among males, kinship care was associated with higher likelihood of delinquency for African Americans, Whites, and Asians, while it was associated with lower likelihood of delinquency for Hispanics. Among females, kinship care was associated with lower likelihood of delinquency for Hispanics, while it was not associated with delinquency for other race groups. Their findings highlighted that kinship care effects varied with race/ethnicity and gender.

The mixed findings on kinship care are also consistent with the complex background of kinship care (Geen, 2004). On one side, kinship care provides better placement stability. Children in kinship care usually live with known relatives, stay in their original neighborhoods, are placed with siblings, and maintain frequent contact with parents. The advantages of kinship care reduce emotional trauma, which can help to prevent delinquency. On the other side, kinship caregivers face more challenges than nonrelative foster caregivers. Kinship caregivers are generally older and have poorer health, lower incomes, and less education. These challenges

limit their abilities to care and supervise children, which are important predictors for juvenile delinquency (Loeber & Dishion, 1983; Loeber & Stouthamer-Loeber, 1987).

Covariates

Age

Many studies have found that timing of maltreatment was related to delinquency (Ireland et al., 2002; Jonson-Reid, 2002; Jonson-Reid & Barth, 2000a; Ryan & Testa, 2005; Smith, Ireland, & Thornberry, 2005; Thornberry et al., 2001). These studies were mostly grounded in developmental theory, which suggests that the age and/or developmental period at which a child is maltreated may play an important role in juvenile delinquency. Findings have suggested that later occurring and chronic abuse increased the risk of delinquency more than early occurring abuse.

Several studies based on the Rochester Youth Development Study (RYDS) reported that maltreatment occurring only in adolescence, and persistent maltreatment from childhood through adolescence caused more negative consequences such as delinquency, than maltreatment occurring only in childhood (Ireland et al., 2002; Smith et al., 2005; Thornberry et al., 2001). Thornberry and colleagues (2001) used a subsample of 736 youth participants who completed all six waves of the study until the age of seventeen. Substantiated maltreatment cases were separated into four timing classifications, namely: early-childhood-only maltreatment (prior to age 6), late-childhood-only maltreatment (ages 6 to 11), adolescence-only maltreatment (ages 12 to 17), and persistent maltreatment (both childhood and adolescence). Their outcome of self-reported delinquency was measured in early (ages 14 to 16) and late (ages 16 to 18) adolescence. Their findings suggested that compared with non-maltreated children, experiencing maltreatment during late childhood doubled the odds of delinquency in early adolescence. Experiencing

maltreatment only during adolescence increased the odds of delinquency in early adolescence by more than four times, and in late adolescence by nearly three times. Experiencing maltreatment during childhood and adolescence persistently increased the odds of delinquency in later adolescence by more than four times. However, youth who were maltreated only during early childhood were not at significantly higher risk for delinquency in early adolescence. In their later studies (Ireland et al., 2002; Smith et al., 2005), the authors incorporated official arrest/contact records as a delinquency measurement. The findings from both later studies confirmed the deleterious impact of maltreatment occurring in adolescence only, and maltreatment during childhood and adolescence persistently.

Similarly, studies that focused on children in placement measured age at placement entry, and found that entering placement at an older age increased the risk of delinquency (Baskin & Sommers, 2011; Ryan & Testa, 2005; Ryan et al., 2010; Ryan et al, 2008).

Gender

Regarding gender difference in delinquency, most studies have shown that maltreated males were more likely to become delinquent than maltreated females (Fang & Corso, 2007; Jonson-Reid, 2002; Jonson-Reid & Barth, 2000a; Jonson-Reid & Barth, 2000b; Jonson-Reid & Barth, 2003; Ryan et al., 2008). Researchers suggested that the difference in delinquency between males and females is due to their different reactions to abuse (Bender, 2010; Maschi, et al, 2008). Generally speaking, males tend to respond to child maltreatment externally, such as with aggression and conduct problems, while females tend to respond internally, such as with depression and suicidal ideation. The external reactions from maltreated males sometimes develop into delinquent behaviors.

Among maltreated children, males and females appear to take different pathways to delinquency. Using a sample from the Longitudinal Pathways to Resilience among Maltreated Youth ($N = 300$), Maschi and colleagues (2008) compared the pathways between males and females. The authors used the CBCL Teach Report to measure of internalizing symptoms and externalizing behaviors. The results from structural equation modeling (SEM) showed that for females, internalizing symptoms mediated the relationship between child maltreatment and externalizing behaviors; for males, there was a direct relationship between child maltreatment and externalizing behaviors. In a recent review article, Bender (2010) reported that for females, mental health problems, substance abuse, and academic problems were important pathways, and for males, association with deviant peers was an important pathway; for both females and males, running away from home was an important pathway. Identifying the various pathways helped to develop intervention strategies to interrupt the relationship between maltreatment and delinquency.

Race/Ethnicity

Regarding racial differences in delinquency, most studies have shown that maltreated minorities were more likely to become delinquent than maltreated Whites (Jonson-Reid, 2002; Jonson-Reid & Barth, 2000a, b; Ryan & Testa, 2005; Ryan et al., 2008; Ryan et al., 2010). The racial/ethnic differences were more apparent when comparing African Americans with Whites. Ryan and colleagues (2007) found that the child welfare system contributed to the overrepresentation of African Americans in the juvenile justice system. Using a sample of juvenile delinquents in Los Angeles County ($N = 69,009$), the authors compared the racial compositions of dependent (i.e. involvement in the child welfare system) and non-dependent subsamples. Within the dependent subsample ($N = 4,811$), there were 46% African American,

39% Hispanic, 11% White, and 1% Asian; within the non-dependent subsample ($N = 64,198$), there were 21% African American, 59% Hispanic, 14% White, and 2% Asian. The authors reported that the effect size associated with African American was medium ($\Phi = .15, p < .01$) and the effect size associated with Hispanic was small ($\Phi = .10, p < .01$). The statistically significant effect sizes indicated that the child welfare system was a contributing source to the overrepresentation.

Although most studies showed that maltreated minorities were more likely to become delinquents than maltreated Whites, no empirical studies have explained the factors affecting racial/ethnic differences. Theoretically, researchers (Jonson-Reid, 2002; Ryan et al., 2008; Ryan et al., 2010) suggested that neighborhood differences between residences of different racial groups might explain differences in delinquency rates. Studies of general populations (Guerra & Williams, 2006; Sampson & Wilson, 1995) found that minority children were more likely to live in dysfunctional neighborhoods, characterized by high crime rates, high unemployment rates, and limited community resources. Exposure to the environmental risks increased their likelihood of delinquency. The same relationship may also be applicable to maltreated children. Since maltreated minority children are more likely to live in dysfunctional neighborhoods than maltreated White children, they are exposed to more environmental risks, and therefore, may have higher delinquency rates.

Maltreatment type

Regarding the association between maltreatment type and delinquency, several studies have reported that neglect was associated with a higher risk of delinquency than other maltreatment types (Jonson-Reid & Barth, 2000a; Jonson-Reid & Barth, 2000b; Widom, 1996). Although neglect was not perceived as being as immediately damaging as physical and sexual

abuse, neglect indicated the lack of parental supervision. Without adequate parental supervision, children from neglectful families were less engaged in academic activities and more exposed to negative peer groups, which increased the risk of delinquency (Jonson-Reid, 2002). Another explanation was the variance in the level of restorative services. Since neglect is usually considered less severe than other types of maltreatment, victims of neglect might receive fewer services than victims of physical and sexual abuse. For example, one study found that victims of neglect were much less likely to receive mental health services than victims of sexual or physical abuse (Garland, Landsvek, Hough, & Ellis-MacLeod, 1996). Without adequate services, victims of neglect were more likely to suffer from the remaining impact of maltreatment and become delinquent (Jonson-Reid & Barth, 2000a). As compared with other maltreatment types, sexual abuse was associated with lower risks of delinquency (Jonson-Reid, 2002). The lower delinquency risk among sexual abuse victims may be confounded by gender impact. Since most of sexual abuse victims were females who were less likely to commit crimes than males, they showed lower delinquency risk.

Neighborhood

Few child welfare studies examined the effect of neighborhoods on delinquency. The only two studies (Schuck & Widom, 2005; Yonas et al., 2010) in this area reported that neighborhood conditions moderated the relationship between maltreatment and delinquency. Each study used different neighborhood measures. Schuck and Widom (2005) reported that neighborhood disadvantages and residential stability moderated the relationship between early child maltreatment and offending. Using the sample of 1,460 children collected from Widom's (1989) earlier study, the authors geocoded the childhood addresses of respondents into the 1970 census tracts. The authors used four indicators of neighborhood conditions, including

concentrated disadvantage (e.g. percentage of families in poverty), residential stability (e.g. percentage of owner occupied and nonmovers in the past 5 years), ethnic heterogeneity (e.g. percentage of nonnative born and Spanish speaking individuals), and concentrated advantage (e.g. individuals with 4 or more years of college). The authors showed that, in the more disadvantaged and more stable neighborhoods, early child maltreatment had a greater impact on later juvenile and adult criminal behavior.

Yonas and colleagues (2010) also reported that neighborhood conditions moderated the relationship between neglect and externalizing behavior. They used a sample of 861 caregivers and 823 youths from a longitudinal study of child abuse and neglect (LONGSCAN). Their neighborhood measure was the mean of caregivers' answers to 12 items assessing collective efficacy (i.e. active participation by neighbors to provide a close, responsible, and accountable neighborhood). The authors showed that, in neighborhoods with higher levels of collective efficacy, youth who experienced neglect had lower externalizing behavior scores in CBCL.

Both studies presented significant limitations with respect to their neighborhood measurements. They only measured the neighborhood conditions of children's original neighborhoods. They did not take into consideration that some children were moved out of their homes after maltreatment. As shown in the annual national report (U.S. Department of Health and Human Services, 2011), 36% of victims of maltreatment were placed into substitute care. Some of the children remain out of their homes for a long time and experienced multiple placement changes. It is possible that their placements are located in neighborhoods outside their original neighborhoods. They in turn may socialize with residents in the new neighborhoods, and adapt to the culture of their new neighborhoods. It is likely that new

neighborhoods have greater influence on them. Future research should examine the impact of new neighborhoods.

Neighborhoods and Juvenile Delinquency

The child welfare systems are required to consider neighborhoods when making placement decisions. As stated in the Adoption Assistance and Child Welfare Act of 1980 (U.S. Public Law 96-272), agencies should find “the least restrictive (most family-like setting) and most appropriate setting available and in close proximity to the parents’ home, consistent with the best interest and special needs of the child”. In practice, placing children in their neighborhoods of origin became the placement priority. Yet this practice is not without debate. Berrick (2006) provided a critical examination of location-based placement criteria. Berrick acknowledged that placing children in their neighborhoods of origin may minimize academic disruptions, encourage cultural continuity, and encourage parents’ visits to their children in care, which increase the likelihood of reunification. However, Berrick argued that placing children in their neighborhoods of origin extended their exposure to distressed neighborhoods, which compromised their potential for achievement in various aspects of life, such as academic performance, health and mental health, and delinquent behavior. Berrick suggested caution towards location-based placement criteria. In contrast, Crampton (2007) argued that placing children in their neighborhoods of origin facilitated child welfare agencies to change the neighborhoods. Child welfare agencies develop partnerships with concerned citizens in those neighborhoods, such as asking them to become foster parents, and provide mentoring or respite for struggling families. Crampton believed that these efforts could strengthen social integration and community support for families, which, in turn, could reduce child maltreatment and the need for foster care.

Both Berrick and Crampton agree that (Berrick, 2006; Crampton, 2007) more research is needed to better understand how neighborhoods may influence children and youth's well-being. One of the important indicators of well-being is delinquency. To date, no study has examined how neighborhoods associated with foster homes might influence delinquency. I hypothesize there is a neighborhood-delinquency relationship for children placed out of their homes. I hypothesize that neighborhood disadvantages, such as high unemployment rates, are positively associated with delinquency, while neighborhood resources, such as collective efficacy, are negatively associated with delinquency. My hypotheses are primarily grounded in the neighborhood studies of the general population. I review this literature and apply the findings to my study of neighborhoods in child welfare. My review will highlight that neighborhood conditions are associated with delinquency, which accounts for racial disproportions in delinquency. In addition to first time offense, studies also have reported that neighborhood conditions impacted recidivism. To explain the mechanisms in neighborhood-delinquency relationships, I will introduce social disorganization theory and social norm theory, both of which have been tested in empirical studies. I will then review neighborhood-based delinquency prevention and intervention programs. I close by proposing critical research questions to contribute to knowledge gaps.

Correlation

Juvenile justice research has a long tradition of studying the impact of neighborhood. Many studies have found that neighborhood conditions were associated with delinquency (Abrams & Freisthler, 2010; De Coster, Heimer, & Wittrock, 2006; Grunwald, Lockwood, Harris, & Mennis, 2010; Mennis & Harris, 2011; Mennis et al., 2011; Sampson, Morenoff, & Raudenbush, 2005; Shaw & McKay, 1942). As early as 1942, Shaw and McKay published their

empirical study on several big cities. They reported that juvenile delinquency was concentrated in the neighborhoods characterized by social disorganization.

Several studies found that neighborhoods largely accounted for racial differences in delinquency (De Coster, Heimer, & Wittrock, 2006; Sampson, Morenoff, & Raudenbush, 2005). More specifically, minority youth have higher rates of delinquency, because they are more likely to live in disadvantaged neighborhoods and to be exposed to community violence. Studying a sample of 11,207 individuals from Add Health, De Coster and colleagues (2006) examined the effects of neighborhood level and individual level variables on violent delinquency. The authors reported that the effect of race disappeared after controlling for community disadvantages. Being a minority did not predict violent delinquency, while community disadvantage was positively associated with violent delinquency. Sampson and colleagues (2005) also reported that the difference on perpetrating violence between different race groups was explained by neighborhood social contexts along with the marital status of parents, and number of immigrant generations.

Dysfunctional neighborhoods can also compromise positive family influences. In dysfunctional neighborhoods, healthy families that feature high levels of parenting practice and structure are less effective in protecting youth from becoming delinquent. Gorman-Smith and colleagues (2000) studied how neighborhood characteristics moderated the effect of family functioning on delinquency. The authors selected a sample of 288 male adolescents from the Chicago Youth Development Study. The authors derived three neighborhood clusters, i.e. inner city with functioning social processes; inner city without functioning social processes; other urban communities-those with fewer disadvantages, and four family functioning clusters, i.e. exceptionally functioning; task-oriented; struggling; and moderately functioning. The authors

reported that the extent to which healthy family functioning protected youth from delinquency depended on neighborhoods. In less disadvantaged neighborhoods, healthy family functioning better protected youth from becoming delinquent, while in more disadvantaged neighborhoods, healthy family functioning was less effective in protecting youth from the effects of deviant street culture.

In addition to first time offence, studies also showed that neighborhood conditions were associated with recidivism (Abram & Freisthler, 2010; Grunwald et al., 2010; Mennis & Harris, 2011; Mennis et al., 2011). First time offenders from disadvantaged neighborhoods are more likely to commit crimes again. Abram and Freisthler (2010) studied the association between the level of neighborhood risks and resources and reentry rates among incarcerated youth. The author collected reentry records of 4,398 juvenile offenders released from LA probation camps in 2007. The authors used zip code as the spatial scale to measure neighborhoods. Using spatial analysis, the authors reported that poverty rates, percentages of African Americans and Hispanics, and neighborhood risks, including assault rates and alcohol outlet density, were positively associated with reentry rates, while none of the neighborhood resource variables were significant. Their finding suggested more efforts are needed to address environmental risks.

Using administrative data from Philadelphia, Grunwald, Mennis, and colleagues also identified the effect of neighborhood conditions on recidivism (Grunwald et al., 2010; Mennis & Harris, 2011; Mennis et al., 2011). Instead of commonly used spatial scales like zip code, they used the forty-five non-overlapping neighborhoods in Philadelphia, developed by researchers at Temple University. Grunwald and colleagues (2010) studied a sample of 7,061 delinquent male juveniles committed to community-based programs. Using hierarchical generalized linear model, the authors showed that neighborhood disadvantages and social capital predicted the recidivism

of drug offenses, but no other types of offense. Youth in disadvantaged neighborhoods are especially attracted to the economic benefits of drug businesses. In another study, Mennis and Harris (2011) reported that the recidivism rates between nearby neighborhoods were positively correlated, which was called spatial contagion. Their third study (Mennis et al., 2011) confirmed the presence of spatial spillover effects that might occur from the interactions between youths in nearby neighborhoods.

Theories

Social disorganization theory and social norm theory have attempted to explain the neighborhood-delinquency relationships. Social disorganization theory emphasizes the inability of a community structure to realize the common values of its residents and maintain effective social controls (Sampson, 1997). According to this theory, neighborhoods characterized by high poverty, residential instability, and ethnic heterogeneity have limited social control over the behaviors of the residents, and therefore, experience high crime rates. Collective efficacy is an important concept in social disorganization theory. It is defined as social cohesion among neighbors, combined with their willingness to intervene on behalf of the common good (Sampson, Raudenbush, & Earls, 1997). Instead of relying on formal controls such as police and courts, residents in socially cohesive neighborhoods are likely to execute informal social control to achieve public order. For example, residents voluntarily monitor spontaneous play groups among children. Social disorganization theory considers collective efficacy as the mechanism behind the association between neighborhood conditions and delinquency.

Shaw and McKay (1942) first proposed social disorganization theory. They suggested that both residential instability and ethnicity heterogeneity increased the likelihood of social disorganization, which accounted for high delinquency rates. However, they did not measure

social disorganization and empirically test social disorganization theory. Their discussion of social disorganization was more of a theoretical interpretation (Bursik, 1988).

Since the 1980s, researchers have started to directly measure social disorganization and test its mediation effect (Elliott et al., 1996; Sampson, 1997; Sampson & Grove, 1989; Sampson, Raudenbush, & Earls, 1997). There have been two types of studies, neighborhood-level studies and multi-level studies. The first group of empirical studies used neighborhood level data. Researchers showed that social disorganization mediated the effect of neighborhood conditions on neighborhood delinquency/crime rates at the neighborhood level. Sampson and Grove (1989) measured social disorganization using three variables, including local friendship networks, control of street-corner teenage peer groups, and the prevalence of organizational participation. The authors used a sample of 230 localities in Great Britain surveyed in 1982 and another sample of 300 British localities surveyed in 1984. Findings from both samples showed that social disorganization mediated the effects of community structural characteristics on neighborhood criminal victimization and offending rates. Sampson's later study (1997) of a sample from the U.S. (City of Chicago) also showed the mediation effect of social disorganization.

The second group of empirical studies used both neighborhood-level and individual-level data. These studies benefited from the development of the hierarchical linear model (HLM), which estimates model coefficients and random effects at each level. HLM takes into account the dependence between individuals nested in the same neighborhoods (Raudenbush & Bryk, 2002). HLM separates the effect of neighborhoods from the effect of individuals and families, and therefore, reduces selection bias. Using HLM, Elliott and colleagues (1996) reported that the organizational and cultural characteristics of neighborhoods mediated the effect of neighborhood disadvantages on problem behavior, which included delinquent behavior, drug use,

and arrest. The authors used data from Chicago and Denver. The authors reported that informal control accounted for 60% of the variance in problem behavior between neighborhoods in Chicago, and informal networks accounted for 26% of the variance in problem behavior between neighborhoods in Denver. Sampson and colleagues (1997) also reported that collective efficacy mediated the effects of concentrated disadvantages and residential stability on violence.

Social norm theory emphasizes the effect of subculture on delinquency. Social norm theory was proposed in Anderson's (1999) ethnographic study of neighborhoods in Philadelphia. Anderson found that neighborhood subculture mediated the association between neighborhood conditions and violent delinquency. The high rates of male joblessness, poverty, substance abuse, and the lack of institutional resources among poor inner-city black neighborhoods fostered the violence-prevalent "code of street", i.e. a set of informal rules governing interpersonal public behavior, particularly violence, and therefore, increased violent delinquency rates. He showed that, as the poor inner-city black neighborhoods became alienated from mainstream society and ignored by institutions like the police, the residents relied on violence to defend themselves and earn respect.

Recently, researchers have started to develop ways to measure the "code of street" and test social norm theory with quantitative data. Using survey data on Seattle neighborhoods collected in 2002-2003, Matsueda and colleagues (2006) explored whether "code of street" could be measured accurately, and correlated with neighborhood conditions. The survey included five items to measure neighborhood codes of violence. For example, one of the items was "Do people in your neighborhood agree that in this neighborhood, for young people to gain respect among their peers, they sometimes have to be willing to fight?" All five items had factor loadings around .80, and therefore, the authors claimed that the five items were highly reliable measures

of neighborhood codes of violence. The authors reported that neighborhoods with higher percentages of African Americans and Latinos were more likely to have prevalent violent culture. Neighborhoods of prevalent violent culture had higher violent crime rates.

Stewart and Simons also conducted two studies (Stewart & Simons, 2006, 2010) to test Anderson's social norm theory. They used data from the Family and Community Health Survey (FACHS). In their first study, the authors (2006) showed that individual's adoption of violent culture mediated the effects of neighborhood conditions, family types (decent family or street family), and racial discrimination on violent delinquency. In their second study, Stewart and Simons (2010) added a measurement of neighborhood street culture, for which primary caregivers indicated the extent to which violent culture operated in their neighborhoods. The authors reported that neighborhood street culture was associated with individual youth's involvement in violent delinquency. Moreover, youths who adopted violent culture were more likely to commit crime if their neighborhoods exhibited prevalent violent culture.

Neighborhood-based prevention and intervention

Given that impoverished neighborhoods in inner-cities reported the majority of crimes especially violent crimes, many community programs have been implemented to address crime. Sherman (1997) reviewed the evaluations of community prevention programs from 1936 through 1995. Sherman grouped the programs into three types, gang violence prevention, community-based mentoring, and after school recreation. Reviewing twelve evaluations of gang violence prevention, Sherman reported that the evaluations showed weak evidence of effectiveness. Reviewing seven evaluations of community-based mentoring, Sherman reported more encouraging short-term effects. The experimental-design evaluation of the Big Brothers/Big Sisters in eight cities showed that the experimental group had less drug use and truancy than the

control group at the one year follow-up. For after-school recreation, Sherman found that there were only three evaluations available, including one from Canada, and suggested further research was needed. In summary, Sherman concluded that the evaluations provided only weak evidence of program effectiveness. Sherman stated that community prevention programs failed to reduce the causes of crime. The programs did not resolve economic deprivation and residential instability in disadvantaged neighborhoods.

Sherman's statement was supported by an empirical study. Peterson and colleagues (2000) assessed whether local institutions mediated the effect of economic deprivation and residential instability on violent crime. The authors counted four types of institutions: libraries, recreation centers, retail/employment, and bars. Ideally, the presence of libraries, recreation centers, and retail/employment should reduce the negative effect of economic deprivation and residential instability, while the presence of bars should enhance the effect (Peterson et al., 2000). However, the findings showed that the effects of economic deprivation and residential instability were independent of local institutions. The authors therefore suggested addressing the macro-structural forces that increase economic deprivation and residential instability.

In a more recent review, Greenwood (2008) identified home-visiting programs targeting the families of teenage mothers as the most successful delinquency prevention programs. As for ex-offenders, programs that emphasized family interactions and provided supervision skills to parents successfully reduced their recidivism rates.

The effective programs mentioned above reflected efforts to address social disorganization in disadvantaged neighborhoods. Specifically, community-based mentoring programs enhanced the interaction between residents, which may strengthen collective efficacy in the neighborhood. Programs that emphasized family interactions and provided parents with

supervision skills addressed the lack of social control in disadvantaged neighborhoods. That is, parental control may make up for the lack of social control.

Instead of improving neighborhoods, more radical interventions moved people from disadvantaged neighborhoods to better neighborhoods. For example, the Moving to Opportunity (MTO) Demonstration is a randomized housing-mobility experiment sponsored by the U.S. Department of Housing and Urban Development (HUD). Between September 1994 and August 1998, the MTO demonstration was carried out in five large cities, Baltimore, Boston, Chicago, Los Angeles, and New York. Very low-income families living in public housing or Section 8 project-based housing in extremely poor neighborhoods were eligible for participation. Families were randomly assigned to three groups, the control group, the Section 8-only group (families received Section 8 housing vouchers without limits on redeemable locations), and the experimental group (families received Section 8 housing vouchers redeemable for housing in census tracts with 1990 poverty rates less than 10%).

The findings from the MTO studies were mixed. In 2001, Ludwig and colleagues (2001) evaluated the impact of MTO on juvenile crime in the Baltimore site. As for the outcome, the authors followed official arrest histories of a sample of 279 MTO teens for an average of 3.7 years. The authors reported that the experimental teens showed the prevalence and incidence of violent crime to be one-half of the control teens; the Section 8-only teens showed the incidence of violent crime to be one-half of the control teens. Their findings suggested that moving families to lower-poverty neighborhoods reduced juvenile crime. Similarly, the study of the Boston site (Katz, Kling, & Liebman, 2000) found that boys in the experimental group and the Section 8 group exhibited around one third of the behavior problems as compared with boys in the control group. However, the authors did not find significant decrease of behavior problems

among girls. The study of New York City site (Leventhal & Brooks-Gunn, 2003) did not show a significantly different delinquency rates between groups. A subsequent study (Kling, Ludwig, & Katz, 2005) using data from all five sites found that moving to better neighborhoods reduced criminal behaviors among girls, but generated mixed results for boys. That is, moving to better neighborhoods was associated with lower rates of violent crime, but higher rates of property crime among boys.

Length of Time in Neighborhood

Neighborhood effects take time to operate. A review of neighborhood effects studies (Dietz, 2002) suggested that the magnitude of neighborhood effects depends on the duration of neighborhood membership. The longer an individual stays in the same neighborhood, the greater he/she is influenced by the neighborhood (Ellen & Turner, 1997). However, the measure of length of time in neighborhood is not always available in studies.

Recent studies on the MTO Demonstration obtained the measure of length of time in neighborhood and included it in their analyses. For example, Kling and colleagues (2007) weighted neighborhood poverty by duration in neighborhood. Their findings indicate that duration-weighted neighborhood poverty was negatively associated with an overall index of adult outcomes, which mainly reflects the relationship between duration-weighted neighborhood poverty and mental health. Clampet-Lundquist and Massey (2008) included the measure of the cumulative amount of time spent in different neighborhood environments, and reported that neighborhood is associated with financial outcomes such as employment, earnings, TANF receipt, and use of food stamps. In a qualitative study at the MTO Baltimore site, Turney et al. (2006) provided an explanation for why the experimental group did not show significantly better adult economic self-sufficiency. One of the explanations is that the experimental group has not stayed in low poverty neighborhoods long enough.

Research Questions

My review finds that there are few child welfare studies on neighborhood effects. Gaining knowledge in this aspect can inform the debate on location based placement criteria (Berrick, 2006; Crampton, 2007). My review of studies on general population does indicate that neighborhoods effect delinquency. Social disorganization theory and social norm theory provide explanations for this relationship. Based on the review, I intended to address following research questions in this study.

1) How are foster care placements distributed in Cook County, Illinois? I hypothesize that there are overlaps between the spatial distribution of foster care placements and neighborhood demographics (e.g. percentage of below the poverty line).

2) Do the neighborhoods associated with foster care placement affect the risk of delinquent offending for adolescents in the child welfare system? I hypothesize that concentrated disadvantages (e.g. high percentage of below the poverty line) and ethnic heterogeneity of the neighborhoods are positively associated with delinquency, while residential stability is negatively associated with delinquency. I also hypothesize that social disorganization and social norms mediate the relationship between neighborhood demographics and delinquency. Social disorganization is indicated by collective efficacy and neighborhood disorder. Collective efficacy is a combination of social cohesion and informal social control. Social norms are indicated by neighborhood violent culture.

3) Does length of time in care moderate the relationship between neighborhood characteristics and delinquency among foster youth? I hypothesize that length of time in care moderates the relationship between neighborhood characteristics and delinquency among foster youth. The magnitude of neighborhood effects is greater for foster youths in care for longer time.

CHAPTER 3

METHODS

Sample

The original sample is 18,676 children from Cook County, Illinois. Cook County contains the City of Chicago and surrounding suburbs. The sample comprises two birth cohorts born in 1983 and 1984. The sample was selected from the official child abuse and neglect records maintained by the Illinois Department of Child and Family Services (IDCFS). All children were associated with at least one substantiated allegation of maltreatment. I extracted all the foster care placement records and delinquency records for each case. Birth cohort studies have unique advantages over regular panel studies. Regular panel studies recruit subjects of different ages. Due to the age differences, subjects are under observation for different lengths of time. For example, a youth aged 14 at the beginning of the study will be followed for three years to document his/her delinquency records until age 16, while another youth aged 15 at the beginning of the study will be followed for two years. Unlike regular panel studies, birth cohort studies allow for equal lengths of observations of all cases in the sample. The unique advantage of birth cohort studies ensures that the outcome measure is independent from individuals' ages. An earlier study by Ryan and Testa (2005) used the same sample. The authors reported that child welfare placement and multiple placement changes increase the risk of delinquency. The current study selected the subsample from the City of Chicago and added the neighborhood variables from the 1990 census and the community survey of the Project of Human Development in Chicago Neighborhoods (PHDCN) into the analysis.

I used four criteria for sample selection. First, I selected the individuals who stayed in at least one out-of-home placement for 30 days or longer. This criterion is used to select foster

youth who spent sufficient time staying in at least one placement and being exposed to the neighborhood. I only selected the placement types that provide youth the opportunities to interact with people in their neighborhoods. Such placements include traditional foster home, relative care, home of adoptive parents, group home, transitional living, and independent living, while not including restrictive placements such as residential treatment centers, hospitals, and correctional institutions. Out of the 18,676 individuals in the original sample, 5,233 individuals stayed in at least one such placement for 30 days or longer. Second, I selected individuals younger than age 14 at the time of first placement. I used the 14th birthday as the dividing line for measuring independent and dependent variables. The independent variables such as neighborhood variables were collected prior to age 14. The measure of the dependent variable, delinquency, followed each individual's delinquency records from age 14 through age 16. In Illinois, the upper age of jurisdiction at a juvenile court is age 16. The dividing line clarifies the temporal order of measuring independent and dependent variables. It enhances the internal validity of this study. Application of the criteria decreased the sample size to 4,906. Third, I selected individuals whose placements were all located in the City of Chicago. This criterion is applied because the variables of neighborhood social processes are only available for the City of Chicago. Dropping the out-of-city cases from the sample decreased the sample size to 2,523. Fourth, I selected the individuals with no delinquency charges prior to age 14. This is in consistent with the dividing line of variable measurements as mentioned in the second criterion. This resulted in a final sample size of 2,360.

The sample was 89.58% African American, 3.22% Caucasian, and 7.20% Hispanic. Nearly half (47.92%) of the sample was male. The average age at the time of first indicated maltreatment was 6.45 years old.

The study was approved by the Institutional Review Board at the University of Illinois at Urbana-Champaign.

Data and Measures

IDCFS administrative data. IDCFS administrative data was obtained from the integrated database provided by the Illinois Department of Children and Family Services (IDCFS). The database documents child protective services and child welfare services provided to the children and households in Illinois. I extracted data on individual demographics, maltreatment experiences (i.e. age at maltreatment, maltreatment types, the numbers of maltreatment report dates), and placement experiences for the sample. I also extracted census tract numbers of the children's placements.

Cook County Juvenile Court administrative data. Cook County Juvenile Court administrative data provides delinquency arrest records. The data contain arrest dates, offense types, and individual demographics. The arrest records and child welfare records were linked by common identifiers (i.e. last name, first name, date of birth, race, and gender) using probabilistic record linkage techniques. Chapin Hall Research Center at the University of Chicago conducted the link for an earlier research study using this data (Ryan & Testa, 2005). The dependent variables in the current study are four dichotomous variables, including delinquency in general, drug offenses, violent offenses, and property offenses.

Census data. This study uses data from the 1990 Census, which provides statistics on the social, political, and economic aspects of neighborhoods. The 1990 census data were collected five years prior to the community survey of the PHDCN. The temporal order allows me to examine the process of neighborhood impacts. To identify the underlying factors in census data, I applied factor analysis. Following a previous study on Chicago neighborhoods (Sampson et al.,

1997), I used the alpha-scoring method for factor extraction and oblique (promax) rotation as the rotation strategy. Opposite from orthogonal rotation which means that the factors are not correlated, oblique (promax) rotation allows the factors to be correlated (Kline, 1994). Previous studies (Sampson et al., 1997) also treated neighborhood factors as being correlated.

The results of factor analysis are displayed in Table 1. Three factors with eigenvalues greater than 0.90 were retained. The traditional benchmark for eigenvalue is 1.0. However, only two factors have eigenvalues greater than 1.0. The factor loadings of only two factors do not provide meaningful interpretation, and so it may be better to use more than two factors. The decision on using three factors is further supported by scree plot. There is a significant jump in the slope of the scree plot from 3 factors to 4 factors (the eigenvalue for 3 factors is 0.94; the eigenvalue for 4 factors is 0.13). The three factors are named concentrated disadvantage, ethnic heterogeneity, and residential stability. Concentrated disadvantage is the combination of percentage of households below the poverty line, households on public assistance, female-headed households, unemployed population, and persons less than 18 years old. Ethnicity heterogeneity is the combination of the percentage of African American, Hispanic, and foreign-born. Residential stability is the combination of the percentage of residents living in the same house as five years earlier, and owner-occupied homes. The emergence of the three factors is consistent with previous literature (Sampson et al., 1997). But unlike previous literature, my analysis finds that the percentage of African American loads on ethnic heterogeneity rather than concentrated disadvantage. For each factor, I calculated a factor regression score that weighted each variable by its scoring coefficient.

Table 1. Rotated factor pattern (N=2,360)

	Concentrated disadvantage	Ethnic heterogeneity	Residential stability
Below poverty line	<u>0.79</u>	-0.01	-0.35
On public assistance	<u>0.87</u>	-0.16	-0.11
Female-headed families	<u>0.86</u>	-0.24	0.08
Unemployed	<u>0.84</u>	-0.17	-0.09
Less than age 18	<u>1.07</u>	0.35	0.19
Black	0.18	<u>-0.85</u>	0.12
Hispanic	0.22	<u>0.99</u>	0.08
Foreign born	-0.09	<u>0.90</u>	-0.11
Same house as in 1985	0.12	-0.37	<u>0.64</u>
Owner-occupied house	-0.22	0.01	<u>0.90</u>

Community survey of PHDCN Based on the City of Chicago, the PHDCN is a longitudinal study designed to investigate the pathways to delinquency and criminal behaviors, and the effects of neighborhoods on individuals. This study uses the data from its community survey, which measured the structural conditions and organization of neighborhoods in Chicago with respect to the dynamic structure of the local community, the neighborhood organizational and political structures, cultural values, information and formal social control, and social cohesion (Earls, Brooks-Gunn, Raudenbush, & Sampson, 2007). The survey was conducted with 8,782 adult Chicago residents from 343 neighborhood clusters (NCs) in 1994 through 1995. The PHDCN researchers combined all 865 census tracts within Chicago into 343 NCs based on spatial contiguity and internal homogeneity with respect to race and ethnicity, socioeconomic status, and family structure. This study uses NC as the spatial scale to define neighborhoods.

This study uses three constructs of neighborhood social process from the community survey. The three constructs are collective efficacy, neighborhood disorder, and violent culture. Collective efficacy is the combination of informal social control and social cohesion. Informal social control was measured by five items asking respondents how likely their neighbors could be counted on to intervene if “children were skipping school and hanging out on a street corner”, “children were spray-painting graffiti on a local building”, “a child was showing disrespect to an adult”, “a fight started in front of their house”, and “the fire station closest to their home was threatened with budget cuts”. Social cohesion was measured by five items asking respondents how strongly they agreed that “people around here are willing to help their neighbors”, “this is a close-knit neighborhood”, “people in this neighborhood can be trusted”, “people in this neighborhood generally do not get along with each other”, and “people in this neighborhood do not share the same values” (the last two items were reversely coded). I used aggregated scores of informal social control and social cohesion that were provided by the PHDCN research scientists. The correlation between informal social control and social cohesion is high ($r = 0.91$, $p \leq 0.001$). Therefore, I combined informal social control and social cohesion into collective efficacy. An earlier study (Sampson et al., 1997) using the PHDCN data also confirmed the validity of the collective efficacy measure as a combination of the same ten items.

Neighborhood disorder was measured by six items asking respondents how much of a problem each item is in their neighborhoods, “litter, broken glass or trash on the sidewalks and streets”, “graffiti on buildings and walls”, “vacant or deserted houses”, “drinking in public”, “people selling or using drugs”, and “groups of teenagers or adults hanging out in the neighborhood and causing trouble”. I used aggregated scores of neighborhood disorder that were provided by the PHDCN research scientists. Violent culture was measured by five items asking

respondents how strongly they agreed that “laws were made to be broken”, “it is okay to do anything you want as long as you do not hurt anyone”, “to make money, there are no right and wrong ways anymore, only easy ways and hard ways”, “fighting between friends or within families is nobody else’s business”, and “nowadays a person has to live pretty much for today and let tomorrow take care of itself”. I used aggregated scores of violent culture that were provided by the PHDCN research scientists. For reference convenience, in Appendix 1, I list the three neighborhood constructs and their corresponding items.

Neighborhood variables were weighted and aggregated at the individual level. Some foster youths lived in multiple neighborhoods due to placement changes. The 2,360 youths in the sample have a record of 3,778 neighborhood clusters. On average, each individual stayed in 1.60 neighborhood clusters. Therefore, I weighted the neighborhood variables by the proportion of length of stay in each specific neighborhood during their total time in care. For example, if a person stayed in Neighborhood A for 40% of the time and Neighborhood B for 60% of the time, I would weight all neighborhood variables of Neighborhood A by .40, and weight all neighborhood variables of Neighborhood B by .60. After weighting, I summed each neighborhood variable at the individual level. This strategy allowed me to include all the neighborhoods associated with each individual in the analysis.

Analytic Strategies

Research question one: The distribution of foster care placements in Chicago

Exploratory spatial data analysis I explored the pattern of foster care placement distribution through mapping and visualizing spatial statistics. I used ArcGIS for mapping. As mentioned earlier, neighborhood variables were weighted and aggregated at the individual level. I also applied weights and aggregation in mapping. In ArcGIS, I constructed the weighted mean

center of all neighborhoods associated with each individual. Each point on the map indicates the weighted mean center of one individual. I projected the individual points on the Chicago map color shaded by poverty rates to examine the overlap between the spatial distribution of foster youths and neighborhood poverty.

I conducted exploratory spatial data analysis to generate two spatial autocorrelation statistics, Moran's I and local indicators of spatial association (LISA), both of which measure spatial cluster. Moran's I measures global spatial association, while LISA measures local spatial association.

Moran's I is a classic indicator of global association (Rogerson & Yamada, 2009).

Moran's I is calculated in the following formula:

$$I = \frac{m \sum_i^m \sum_j^m w_{ij} (y_i - \bar{y})(y_j - \bar{y})}{(\sum_i^m \sum_j^m w_{ij}) \sum_i^m (y_i - \bar{y})^2}$$

In the formula, m indicates the total number of regions, y_i indicates the observed value for the core region i , y_j indicates the observed value for each of all the other regions, \bar{y} is the mean of all regions, and w_{ij} is the measure of the spatial proximity between region i and j . I used first order queen contiguity to create the weight matrix (Appendix 2 illustrates first order queen contiguity). Accordingly, the value of w_{ij} equals 1 when the regions i and j are neighboring regions, and equals 0 when the regions i and j are not neighboring regions. Moran's I roughly ranges within the interval $[-1, 1]$. Similar to the correlation coefficient, a value near zero indicates weak spatial association; a value near 1 indicates strong positive spatial association, while a value near -1 indicates strong negative association. When the total number of regions is greater than 20, Moran's I is assumed to follow normal distribution $N(E(I), var(I))$, where

$$E(I) = \frac{-1}{m-1}$$

$$V(I) = \frac{(m)^2(m-1)S_1 - m(m-1)S_2 + 2(m-2)S_0^2}{(m+1)(m-1)^2S_0^2}$$

$$S_0 = \sum_i^m \sum_{j \neq i}^m w_{ij}$$

$$S_1 = 0.5 \sum_i^m \sum_{j \neq i}^m (w_{ij} + w_{ji})^2$$

$$S_2 = \sum_k^m \left(\sum_j^m w_{kj} + \sum_i^m w_{ik} \right)^2$$

Therefore, I can test the significance of Moran's I by referring to the statistics of normal distribution.

LISA decomposes Moran's I into the contribution of each region (Anselin, 1995). This indicates whether local spatial association exists around each specific region. LISA is calculated for each region in the following formula:

$$I_i = \frac{m(y_i - \bar{y})}{\sum_j (y_j - \bar{y})^2} \sum_j w_{ij} (y_j - \bar{y})$$

The notations are the same as the above in Moran's I. The sum of weighted LISA equals Moran's I. That is, $I = \sum_i \sum_j w_{ij} \sum_i I_i$. Although Anselin (1995) suggested mean and variance of LISA for the randomization hypothesis, he cautioned that LISA may not follow a normal distribution. Instead of a significance test, I followed Anselin's suggestion to present LISA through visualization to indicate local spatial clusters and spatial outliers.

I applied exploratory spatial data analysis to examine the spatial clustering of foster youths. I used the percentage of foster youths rather than the count of foster youths in each

neighborhood for the analysis. The percentage is a better measure, because it takes into consideration the size of the population of children. However, the percentage here is not exactly the percentage of foster youths among children aged 6-7 (the sample of 1983-1984 birth cohorts aged 6-7 in the year 1990). The 1990 census data provides the count of children aged 6 and the count of children aged 7-9. It does not provide a separate count of each age year for children aged 7-9. Therefore, I divided the count of foster youths in each neighborhood by the count of children aged 6-9.

I conducted the exploratory spatial data analysis using GeoDa. GeoDa is a free software program specifically for spatial data analysis (Anselin, Syabri, & Kho, 2006). It was invented by Anselin and his spatial analysis laboratory at UIUC, which moved to Arizona State University in 2007. GeoDa can handle constructing spatial weights, computing spatial autocorrelation statistics, as well as visualizing these statistics, all of which were used in the current study.

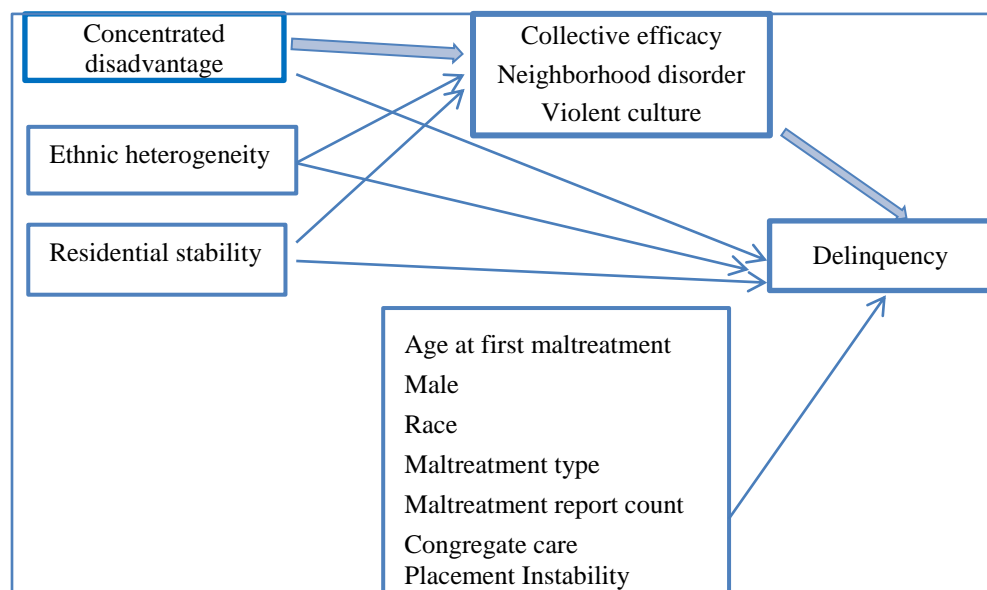
Research question two: The effects of neighborhood on delinquency and the mediators

I used path analysis to examine the relationship between neighborhood sociodemographics and delinquency among foster youths, as mediated by neighborhood social processes. Path analysis is selected for two reasons: first, path analysis simultaneously estimates a system of equations that specify the linkages among a set of variables (Lleras, 2005). Second, path analysis can specify mediation effects. It allows researchers to decompose the total effects of independent variables on the dependent variable into direct and indirect effects. Therefore, researchers can test theoretical hypotheses about mediation mechanisms. In this study, I am interested in examining whether neighborhood social processes mediate the effects of neighborhood sociodemographics on delinquency among foster youths.

I chose path analysis instead of structural equation modeling (SEM). SEM includes both a measurement model and structure model, and has the strength of addressing measurement error. However, in this study, measurement error was corrected in the process of variable construction. The three neighborhood social process variables, collective efficacy, neighborhood disorder, and violent culture, were Empirical Bayes performed by the research scientists of the PHDCN. The research scientists reduced the least square residuals toward zero by a factor proportional to their unreliability (Bryk & Raudenbush, 1992, p.42). The lower the reliability, the more reduction. The research scientists indicated that using the Empirical Bayes performed variables accounts for measurement error and missing data (Morenoff, Sampson, & Raudenbush, 2001).

The hypothesized model is graphed in Figure 1. I hypothesized that neighborhood sociodemographic factors are directly associated with delinquency among foster youths. Their relationship is partly mediated by neighborhood social processes, such as collective efficacy. I controlled the individual characteristics, including demographics, maltreatment experience, and placement experience.

Figure 1. Hypothesized path model



All variables are treated at the same level in the analysis. Multilevel analysis was not used due to the lack of nested structure in the data. Although census data and the PHDCN community survey provide measures of neighborhood characteristics, these variables were weighted and aggregated at the individual level. The neighborhood variables for each individual were based on all of the neighborhoods where he/she had stayed. It is rare that multiple individuals stayed in the same group of neighborhoods, and spent equal proportions of time in each specific neighborhood. Therefore, the data does not have a nested structure.

I conducted the path analysis in Mplus 7.1 (Muthén & Muthén, 2012). The models consist of two types of regression: the regressions on the three neighborhood social process variables, the numeric mediators, are linear regressions; the regressions on delinquency or offense type, the dichotomous dependent variables, are probit regressions. I used weighted least-squares estimation with a mean and variance adjustment (WLSMV), which uses a diagonal weight matrix with standard errors and mean- and variance-adjusted chi-square test statistics that use a full weight matrix (Muthén & Muthén, 2012). The WLSMV fits the data better than Maximum Likelihood (ML), the default estimation method. Since the dependent variables in this study are dichotomous variables, the data violates the assumption of ML, which assumes multivariate normality. The MLSMV does not assume multivariate normality. For dichotomous dependent variables, using MLSMV produces good standard error estimates (Muthén, du Toit, & Spisic, 1997). I will report standardized path coefficients in the tables, which show the relative effect of one variable as compared with other variables (Stage, Carter, & Nora, 2004). When I compare the results of the same model across samples, I will report unstandardized path coefficients in the text.

I used four model fit indices to measure model fit: Tucker Lewis Index (TLI), comparative fit index (CFI), root mean square error of approximation (RMSEA), and weighted root mean square residual (WRMR). The TLI and CFI both assess the model fit by comparing the chi-square value of the model to the chi-square value of the null model that specifies all measured variables to be uncorrelated (Hu & Bentler, 1999). The CFI also takes into account sample size and performs well even when the sample size is small. The TLI and CFI values greater than 0.90 indicate good model fit. RMSEA measures how well the model, with unknown but optimally chosen parameter estimates, would fit the population covariance matrix (Hu & Bentler, 1999). A RMSEA value of 0.05 or less indicates good model fit. Yu and Muthén (2001) suggested that these cut off values are reasonable for categorical dependent variables. WRMR measures the (weighted) average differences between the sample and estimated population variances and covariances (Muthén & Muthén, 2012). The WRMR was recommended by Muthén to measure model fit with categorical observed variables. A WRMR value of less than 0.9 indicates good fit.

I examined neighborhood effects on each offense type in addition to delinquency in general. The variable of offense type indicates charge type in juvenile court records. Each person can have more than one offense type, since each arrest can result in multiple charges. Studying each offense type respectively will show whether certain offense types are more sensitive to neighborhood effects. Previous studies show that neighborhood effects vary with offence type. A study (Kling, Ludwig, & Katz, 2005) on the MTO project showed that male youths that moved to neighborhoods of lower poverty rates had lower violent offenses rates than the control group, but higher property offenses rates. Violent offenses were studied most in earlier studies on neighborhood effects (Anderson, 1999; Sampson et al., 1997). Violent

offenses are assumed to be responsive to neighborhood effects, since youths may learn the violent behaviors from neighborhood violent culture. However, recent studies (Gurnwald et al., 2010; Mennis & Harris, 2003) reported that drug offenses, which are considered instrumental offenses, are more sensitive to neighborhood effects. The authors suggested that youths in neighborhoods with concentrated disadvantages have limited opportunities for employment and legal income, and therefore, are more likely to be involved in the drug business. I examined neighborhood effects on each of three offense types, including drug offenses, violent offenses, and property offenses, while I did not include two other offense types, court order violations and weapon offenses. I did not include court order violations, since they do not indicate offenses which are associated with initial arrests. I did not include weapon offenses, since too few cases were charged with weapon offenses (0.55%).

I split the sample by the length of time in care, and ran the models for each subsample in addition to the whole sample. I used five years as the cut-off point. In the sample, 32.5% of foster youths (N=767) stayed in care for more than five years. This incorporates time dimension into the analysis. As mentioned earlier, time matters for neighborhood effects. The longer an individual stays in the same neighborhood, the greater he/she is influenced by that neighborhood (Ellen & Turner, 1997). In other words, length of stay in care is a moderator in the neighborhood and delinquency relationship. Therefore, I hypothesized that the magnitude of neighborhood effects are greater for the subsample of over five years in care.

To incorporate the time dimension in this study, the strategy of comparing the results from different subsamples works better than using the extended cox model for time-dependent variables. The extended cox model models the time to event in the cases that do not satisfy the proportional hazards assumption, that the hazard ratio between two groups with different values

on the independent variable is constant over time (Kleinbaum & Klein, 2012). As it is hypothesized that neighborhood effects grow with time in care, the hazard ratio is hypothesized to grow greater as time goes, which would be shown as a positive coefficient for the product term involving neighborhood variables and time. However, the extended cox model for time-dependent variables cannot be used in this study, since the neighborhood variables did not simply measure the initial neighborhood where each youth was first placed. Instead, the neighborhood variables are the composites of all neighborhoods in which each individual lived.

I ran separate models for each mediator. I first modeled drug offenses including all three mediators of neighborhood social process in the model. As shown in Table 2, two out of three neighborhood sociodemographic factors, concentrated disadvantage and ethnic heterogeneity, have significant total indirect effects on the risk of drug offenses. That is, each standard deviation increase of concentrated disadvantage is indirectly associated with a 0.13 standard deviation increase on the risk of drug offenses; each standard deviation increase of ethnic heterogeneity is indirectly associated with a 0.02 standard deviation increase on the risk of drug offenses. Given that two total indirect effects are statistically significant, it is clear that three neighborhood social process variables, collective efficacy, neighborhood disorder, and violent culture mediate the relationship between the two neighborhood sociodemographic factors and drug offenses. However, none of the specific indirect effects is statistically significant. Therefore, it is unclear which of the three neighborhood social process variables mediate the relationship between the two neighborhood sociodemographic factors and drug offenses.

Table 2. Result on indirect effects (N=2,360)

Neighborhood sociodemographic factors	Overall (p-value)	Collective efficacy (p-value)	Ethnic heterogeneity (p-value)	Violent culture (p-value)
Concentrated disadvantage	0.13 (0.02)	-0.03 (0.64)	0.12 (0.28)	0.04 (0.46)
Ethnic heterogeneity	0.02 (0.03)	-0.01 (0.64)	0.02 (0.29)	0.01 (0.46)
Residential stability	-0.02 (0.17)	0.01 (0.64)	-0.03 (0.29)	0.00 (0.47)

This may be caused by the strong correlations between the three mediators (Muthén, 2011). The correlations between the three mediators are all statistically significant and have absolute values greater than 0.60. More specifically, the correlation between collective efficacy and neighborhood disorder is as high as -0.91. Multicollinearity can lead the significant variables to appear insignificant in the model (Graham, 2003). To address the problem, previous literature suggested various approaches. For example, Graham (2003) suggested combining the correlated variables into an underlying variable through residual/sequential regression, principal components analysis, or structural equation modeling. I cannot use these approaches, since each of the mediators are related to different theoretical concepts that need to be tested. Therefore, I ran separate models for each mediator.

CHAPTER 4

RESULTS

Exploratory Spatial Data Analysis

Figure 2 shows the spatial distribution of the sample of 2,360 foster youths in Chicago. Each point indicates the weighted mean center of one foster youth. There are 2,360 points on this map. As highlighted, one individual's center is located slightly outside of the city.

Figure 2. Spatial distribution of 2,360 foster youths' mean centers

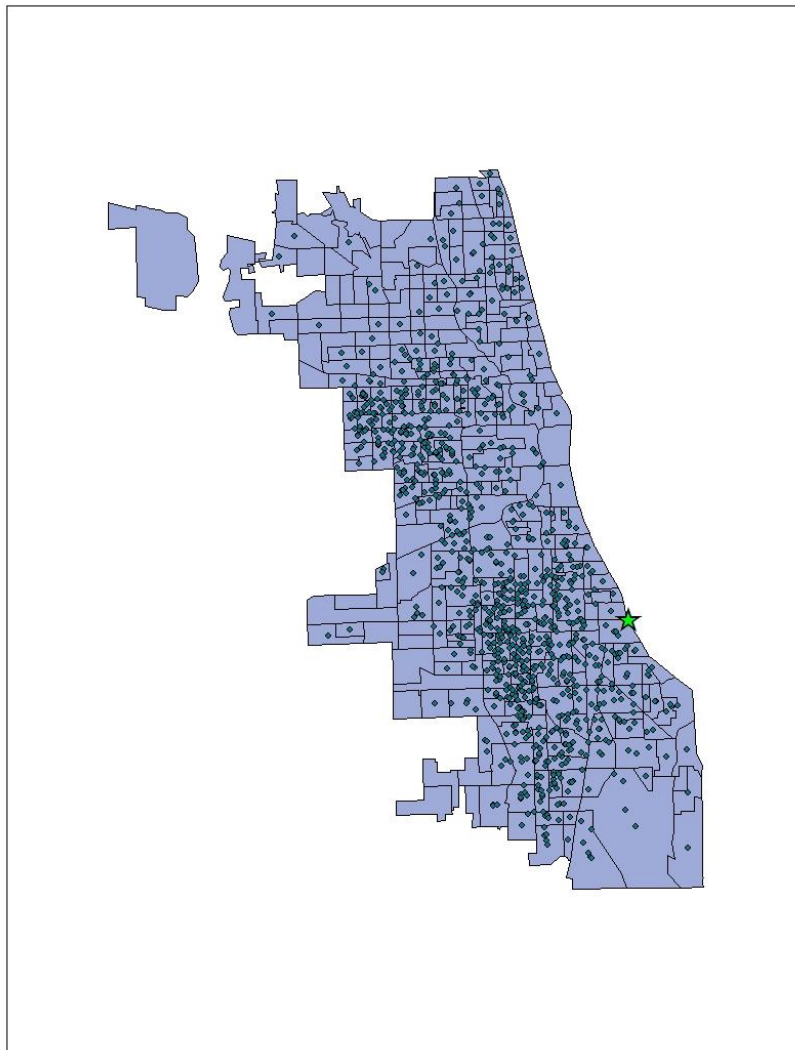


Figure 3 shows the weighted mean center process of this individual. The individual stayed in three different neighborhoods, among which, he/she stayed in the neighborhood in the south for 85% of his/her time in care. The mean center is therefore closest to the neighborhood in the south. Since this individual's weighted mean center is outside of the city, this individual was not included in spatial analysis.

Figure 3. Weighted mean center process for the outside case

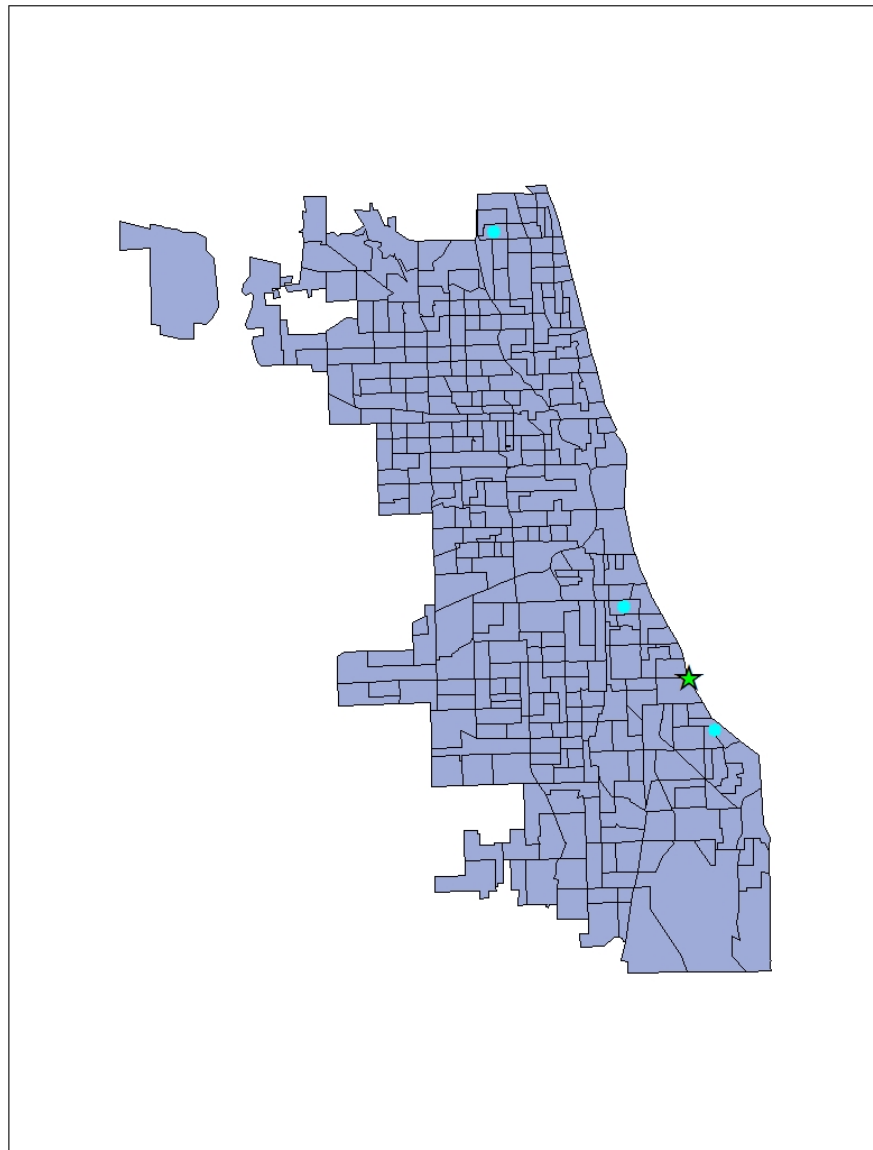
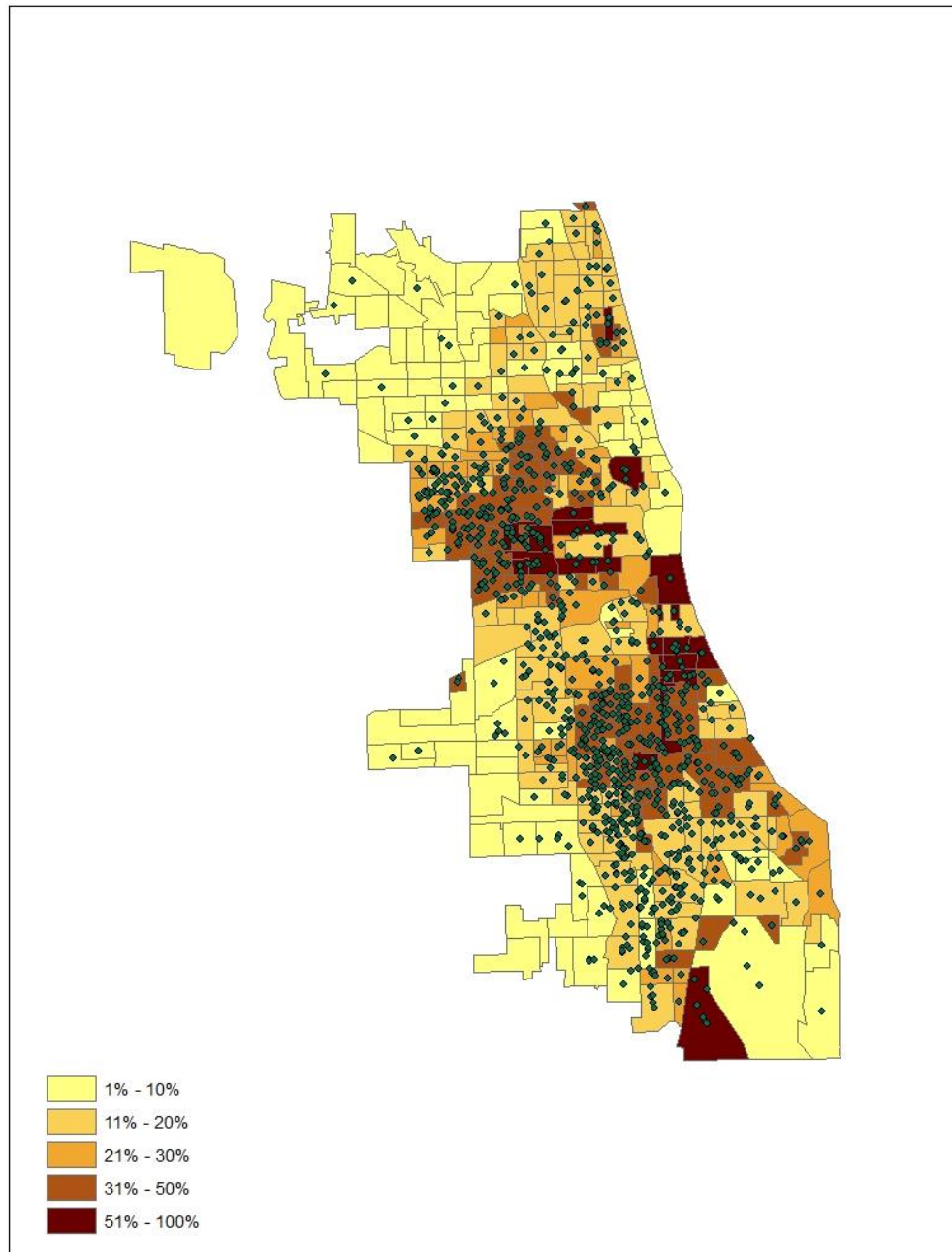


Figure 4 projects the individuals on the map color shaded by poverty rate. It shows that foster youths cluster in the neighborhoods of high poverty rates. This figure serves descriptive purposes. The statistics of spatial cluster are shown in the following part on global and local spatial associations.

Figure 4. Weighted mean centers on the map color shaded by poverty rates



Global spatial association (Moran's I)

I showed both the figure of raw percentage of foster youths and the figure of Moran's I scatter plot to check the consistency of the findings. Figure 5 shows the raw percentage of foster youths in Chicago neighborhoods. The neighborhoods of the two highest percentages of foster youths (3-5% and 6-10%) cluster in the upper west and mid-south sides of Chicago.

Figure 5. Chicago map color shaded by percentage of foster youths

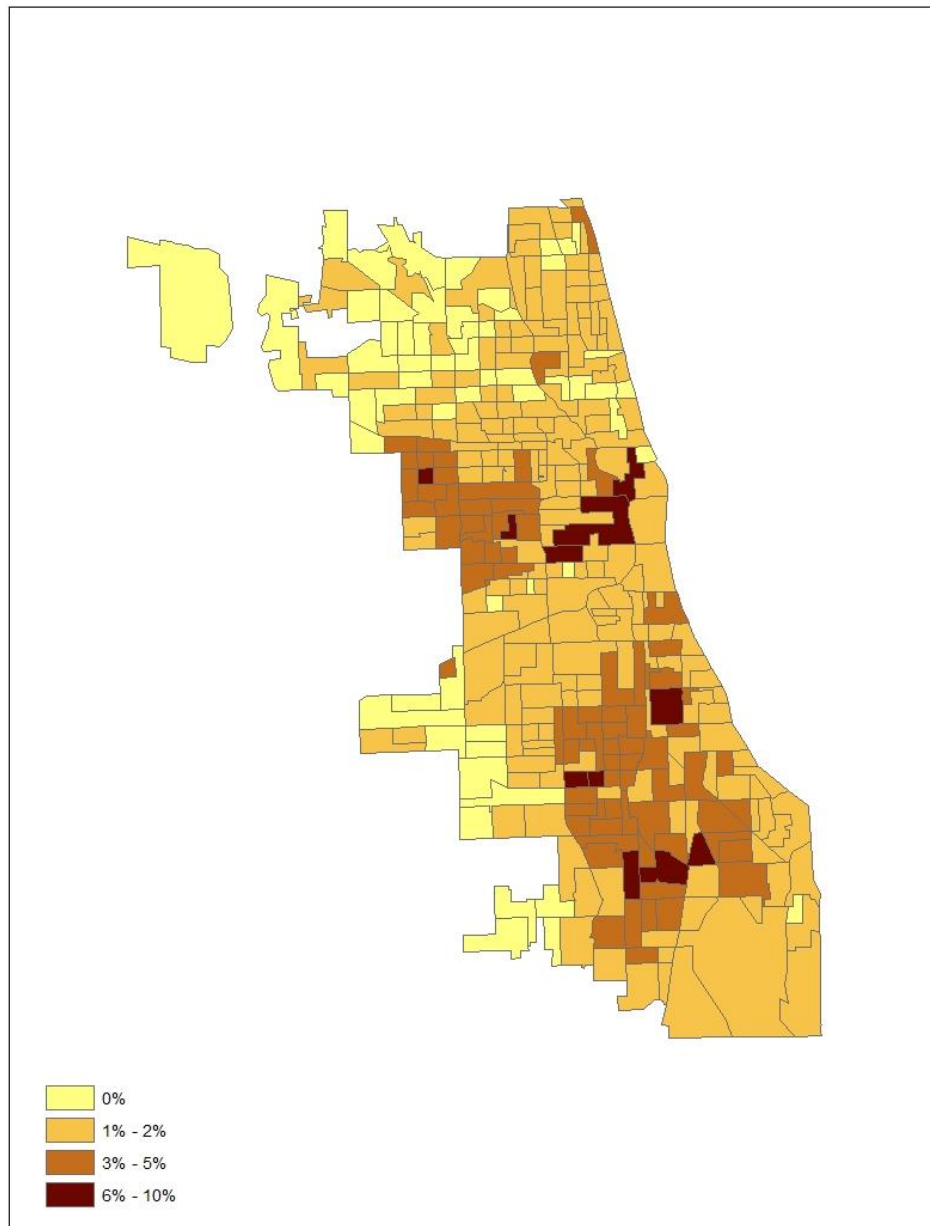
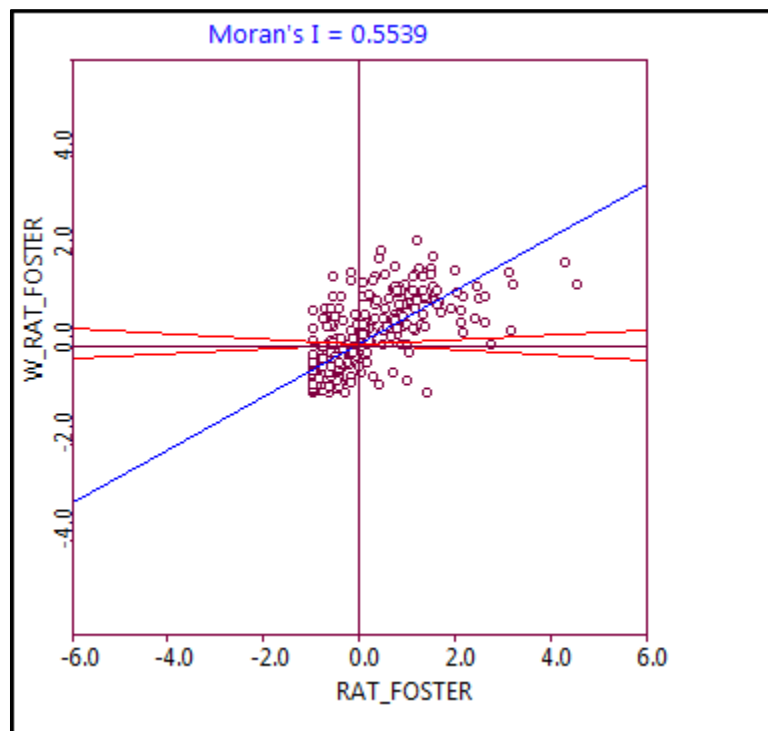


Figure 6 shows Moran scatter plot. The value listed at the top of the figure (0.5539) is the Moran's I statistic. It is significant at $\alpha = .01$ level. The red lines in the figure indicate 95% confidence envelopes around the slope of the regression line in Moran scatter plot. The positive value of Moran's I indicates that the percentage of foster youths in neighboring neighborhoods are positively associated. That is, neighborhoods next to each other have similar levels of percentages of foster youths, which is consistent with the spatial clustering of raw percentages of foster youths in Figure 5.

Figure 6. Univariate Moran scatterplots of foster youths rate at each neighborhood



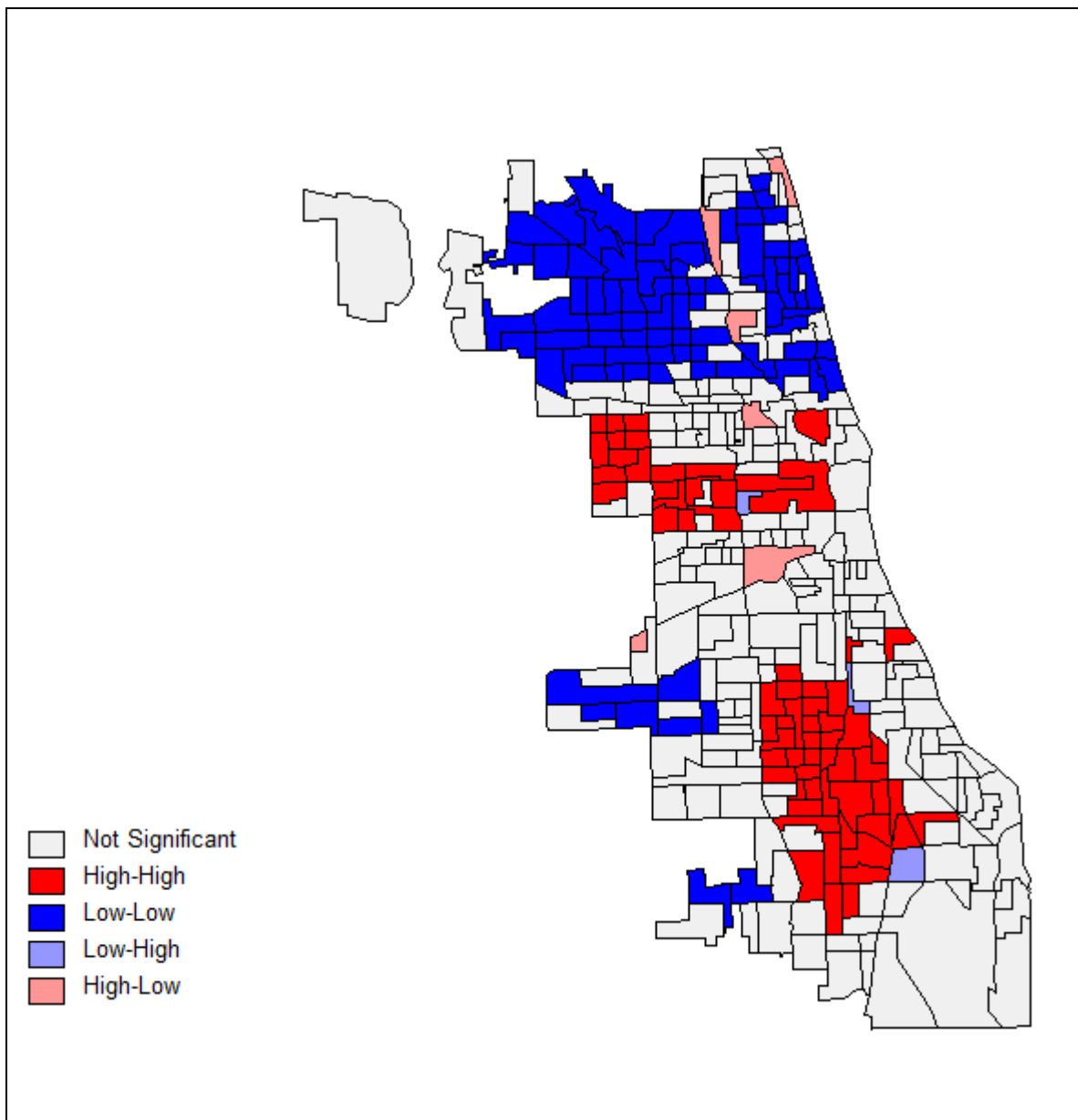
Local indicators of spatial association (LISA)

I used LISA cluster maps to show local spatial clusters. The LISA cluster maps group neighborhoods into five categories depending on significance and type of spatial association (Anselin, 2005). There are five categories: 1) insignificant; 2) high-high indicates the

neighborhood whose own value and its surrounding neighborhoods' values are both greater than the average; 3) low-low indicates the neighborhood whose own value and its surrounding neighborhoods' values are both less than the average; 4) low-high indicates the neighborhood whose own value is less than the average, while its surrounding neighborhoods' values are greater than the average; 5) high-low indicates the neighborhoods whose own value is greater than the average, while its surrounding neighborhoods' values are less than the average. The second and third categories indicate clustering of similar values, while the fourth and fifth categories indicate spatial outliers.

To test my first hypothesis that there are similarities between the spatial distribution of foster care placements and neighborhood demographics, I will compare local spatial clusters between percentage of foster youth and ten census variables. Figure 7 shows a LISA cluster map for percentage of foster youths. As shown in the legend, white indicates not significant, red indicates high-high, blue indicates low-low, purple indicates low-high, and pink indicates high-low. Figure 7 shows that the percentage of foster youths is strongly clustered. The total number of high-high and low-low neighborhoods is much greater than the total number of low-high and high-low neighborhoods. The neighborhoods of high percentage of foster youths cluster in the upper west and mid-south sides of Chicago. The neighborhoods of low percentage of foster youths mostly cluster in the north side of Chicago. These findings are consistent with spatial clusterings of raw percentages of foster youths in Figure 5.

Figure 7. LISA cluster map for percentage of foster youths



The LISA cluster maps for ten census variables are displayed in Figures 8-17, which also indicate strong spatial clustering. The legends used in these figures are the same as the above. The first six variables, percentage of households below the poverty line, households on public assistance, female-headed households, unemployed populations, less than 18 years old, and African American show similar patterns of spatial clustering. That is, high-high neighborhoods of all six of them cluster in the upper west and mid-south sides of Chicago, and low-low

neighborhoods cluster in the north side of Chicago. The two immigration related variables, percentage of Hispanic and foreign-born show similar patterns of spatial clustering. That is, high-high neighborhoods of both of them cluster in the bottom west and middle to north sides of Chicago, and low-low neighborhoods cluster in the upper west and mid-south side of Chicago. The opposite clustering patterns of percentages of African Americans and Hispanics suggest that there are clusters of racially segregated neighborhoods in the City of Chicago. The two residential stability related variables, percentage of residents living in the same house as five years earlier and owner-occupied homes, show similar patterns of spatial clustering. That is, high-high neighborhoods of both of them cluster in the northwest (except for O'Hare airport) and south sides of Chicago, and low-low neighborhoods cluster in the east side of Chicago. It is worth noting that the south cluster of neighborhoods of high-high residential stability does not overlap with the mid-south cluster of neighborhoods of high-high concentrated disadvantages. The south cluster of neighborhoods of high-high residential stability is located further south and around the city edge.

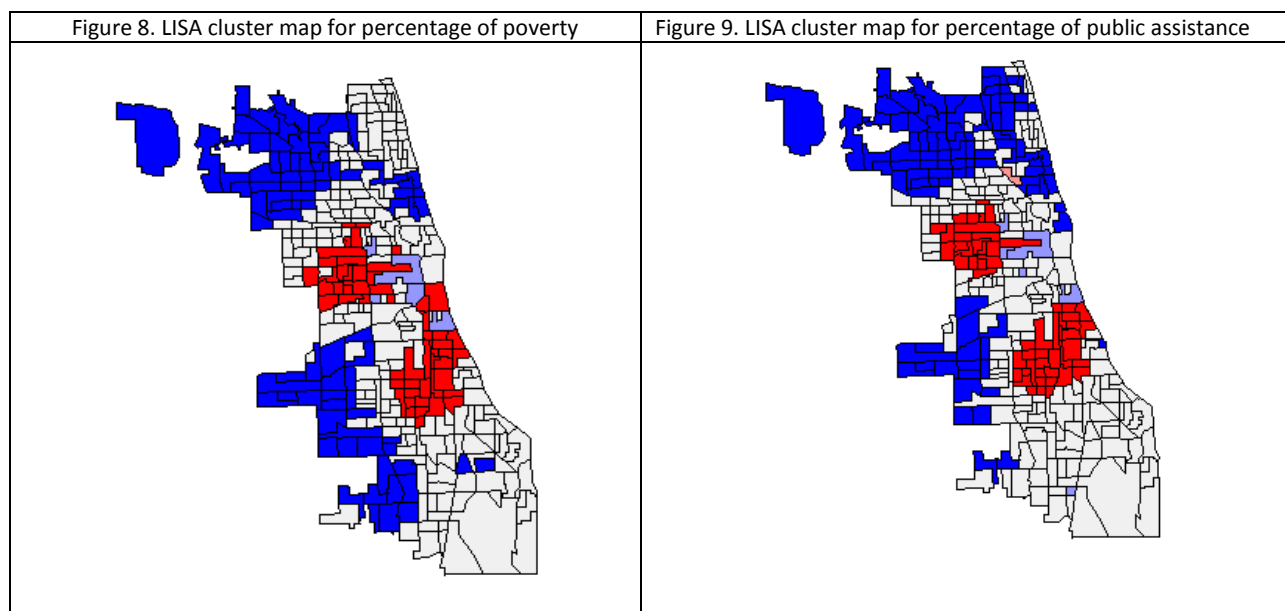


Figure 10. LISA cluster map for percentage of female-headed families

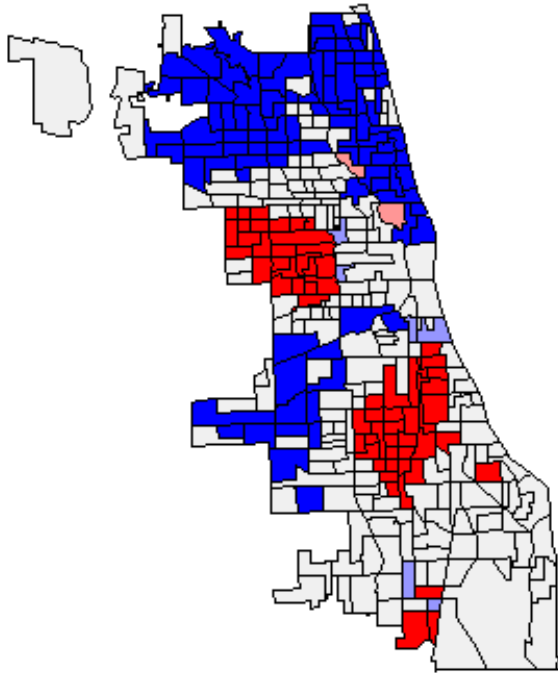


Figure 11. LISA cluster map for percentage of unemployment

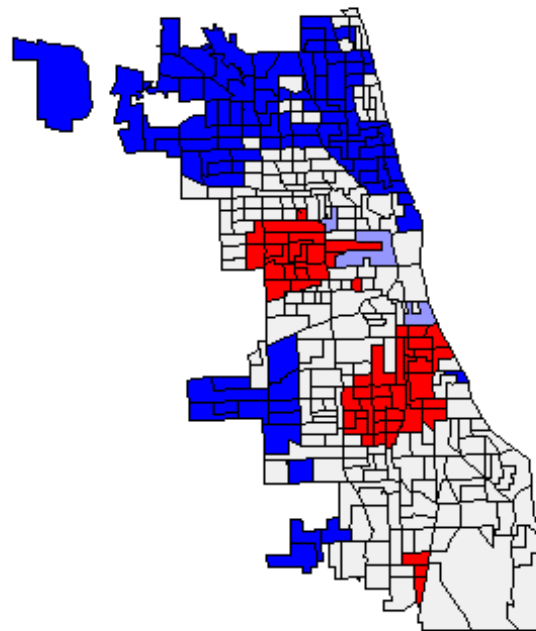


Figure 12. LISA cluster map for percentage of less than age 18

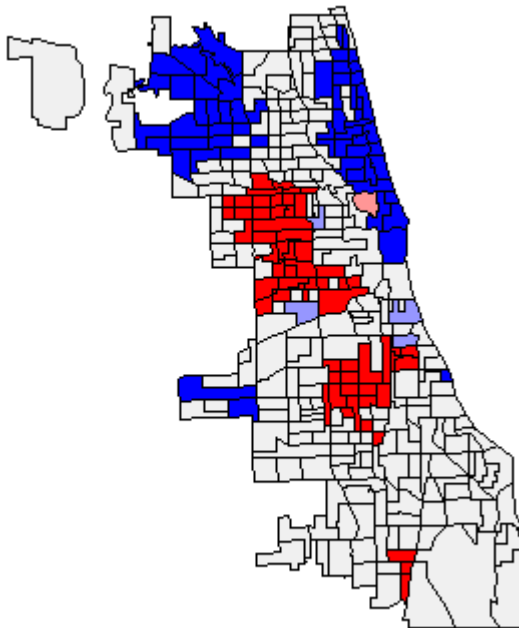
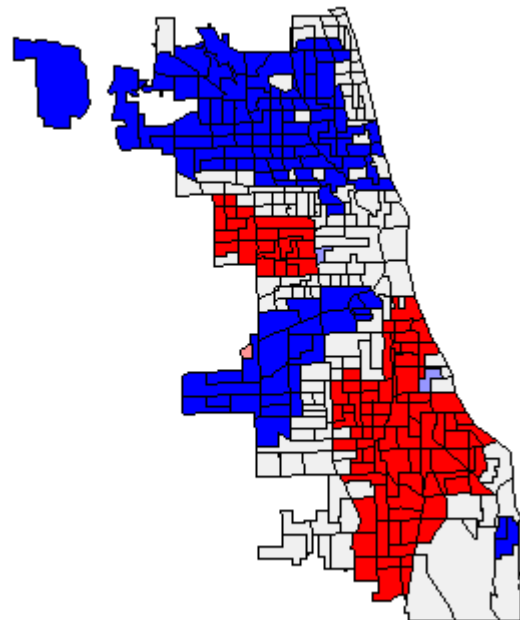
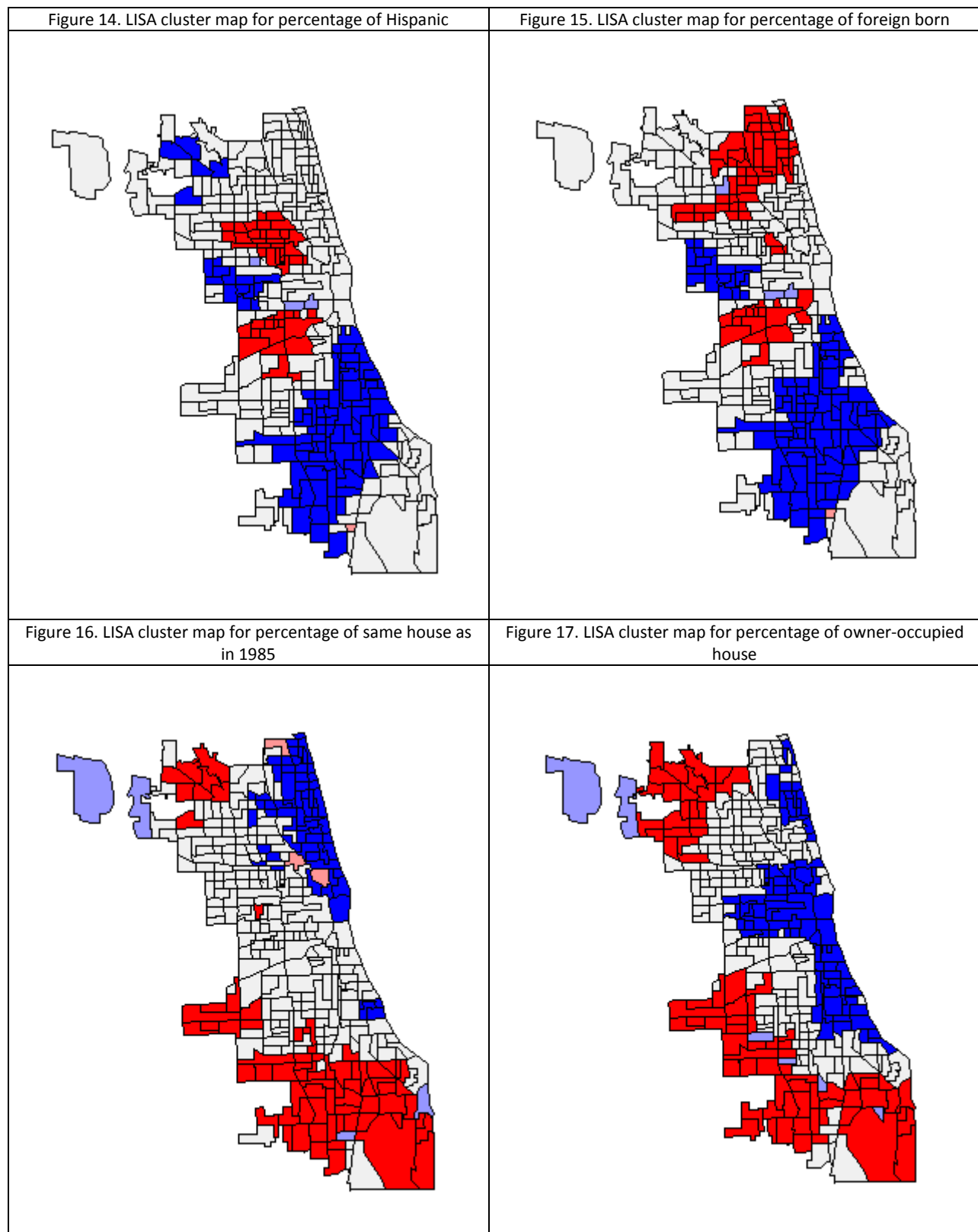


Figure 13. LISA cluster map for percentage of African American





The overlap between the clusters of percentages of foster youths and each of ten census variables is displayed in Table 3. The greater the cell value, the more the overlap. For example,

the first row indicates that 35% of the neighborhoods that are in the high-high category of percentages of foster youths are also in the high-high category of percentages of below the poverty line, while 59% of the neighborhoods that are in the low-low category of percentage of foster youths are also in the low-low category of percentages of below the poverty line. There are large overlaps between the clusters of percentages of foster youths and the first six census variables, namely percentage of households below the poverty line, households on public assistance, female-headed households, unemployed population, less than 18 years old, and African American. The large overlaps support my first hypothesis that there are similarities between the spatial distribution of foster care placements and neighborhood demographics.

The overlap is the largest with the percentages of African Americans. It shows that 92% of the neighborhoods that are in the high-high category of percentages of foster youths are also in the high-high category of percentages of African Americans, while 84% of the neighborhoods that are in the low-low category of percentages of foster youths are also in the low-low category of percentage of African Americans. In other words, foster youths in Chicago cluster in predominantly African American neighborhoods.

Table 3. The Percentage of overlapping high-high and low-low categories

	High-high (%)	Low-low (%)
Below poverty line	35	59
On public assistance	49	75
Female-headed families	62	78
Unemployed	47	75
Less than age 18	35	53
Black	92	84
Hispanic	0	8
Foreign born	0	1
Same house as in 1985	38	38
Owner-occupied house	18	16

Descriptive Analysis

The descriptive analysis of categorical variables is displayed in Table 4. I conducted descriptive analysis of the whole sample, the subsample of 5+ years in care, and the subsample of no more than 5 years in care, respectively. The columns on the left show the frequencies and the ones on the right show the percentages. In the text here, I will first report the results from the whole sample. I will then compare the results between the subsample of different lengths of time in care.

Table 4. Descriptive analysis of categorical variables

	Frequency			Percent		
	All (N=2,360)	5+ years (N=767)	≤5years (N=1,593)	All (N=2,360)	5+ years (N=767)	≤5years (N=1,593)
Age at initial maltreatment (numeric)	6.45	4.68	7.30			
Age at initial maltreatment						
early childhood	1,136	525	611	48.14	68.45	38.36
late childhood	1,074	229	845	45.51	29.86	53.04
adolescence	150	13	137	6.36	1.69	8.60
Male	1,131	369	762	47.92	48.11	47.83
Race						
African American	2,114	729	1,385	89.58	95.05	86.94
Hispanic	170	23	147	7.20	3.00	9.23
Caucasian	76	15	61	3.22	1.96	3.83
Maltreatment type						
sexual abuse	275	88	187	11.65	11.47	11.74
physical abuse	330	107	223	13.98	13.95	14.00
SEI	34	13	21	1.44	1.69	1.32
neglect	1,882	665	1,217	79.75	86.70	76.40
risk of harm	996	235	761	42.20	30.64	47.77
Congregate care	286	64	222	12.12	8.34	13.94
Placement instability						
one placement	843	207	636	35.72	26.99	39.92
two placements	616	215	401	26.10	28.03	25.17
three placements	384	141	243	16.27	18.38	15.25
four+ placements	517	204	313	21.91	26.60	19.65
Length of stay in care						
one year or less	423			17.92		

Table 4 (cont.)

>1-2 years	318			13.47		
>2-5 years	852			36.10		
>5 years	767			32.50		
Delinquency petition	264	88	176	11.19	11.47	11.05
Offense type						
drug offenses	85	31	54	3.60	4.04	3.39
violent offenses	99	36	63	4.19	4.69	3.95
property offenses	80	21	59	3.39	2.74	3.70
court order violations	78	28	50	3.31	3.65	3.14
weapon offenses	13	4	9	0.55	0.52	0.56

Regarding the whole sample, 48.14% of the youths had their first indicated maltreatment report in their early childhood (0-5 years of age); 45.51% of them had their first indicated maltreatment report in late childhood (6-11 years of age); and 6.36% had their first indicated maltreatment report in adolescence (at least 12 years of age). Only a small percent of youths had first report in adolescence, since I excluded the foster youths who entered placement at age 14 or older. Slightly less than half (47.92%) of the youths were male. The vast majority (89.58%) of the sample were African American, 7.2% were Hispanic, and 3.22% were Caucasian.

Maltreatment type indicates the types of all indicated maltreatment allegations associated with each person. Each person can have more than one maltreatment type. The most prevalent types were neglect (79.75%) and risk of harm (42.20%). Few cases (1.44%) were substance exposed infants. Over one tenth (12.12%) of the sample had at least one episode of stay in congregate care placements (i.e. group home, institution of DCFS, institution of private agency, institution of rehabilitation services). Placement instability indicates the number of placements that lasted 14 days or longer. Slightly over one third of the sample stayed in one out-of-home placement, 26.10% stayed in two placements, 16.2% stayed in three placements, and 21.91% stayed in four or more placements. Length of stay in placement indicates the sum of the lengths

of stay in the placements used for creating the neighborhood weight variable. In the sample, 17.92% stayed for one year or less, 13.47% stayed between one and two years, 36.1% stayed over two years but no more than five years, and 32.5% stayed for more than five years.

For the dependent variable, 11.19% of the sample had at least one delinquency petition at 14 years of age or older, which is similar to the delinquency rate (10.62%) of placed youths in the earlier study using the same original dataset (Ryan & Testa, 2005). The slight difference might be due to the sample selection. But the delinquency rate is still much higher than the thgeneral population. The delinquency petition rate of the 1997 national estimate is 3.48% (6.11% delinquency rate \times 57% petition rate = 3.48% petition rate, from Puzzanchera et al., 2000). As for offense type, 3.6% were charged with a drug offenses, 4.19% were charged with a violent offenses, 3.39% were charged with a property offenses, 3.31% were charged with a court order violations, and 0.55% were charged with a weapon offenses.

The subsamples of different lengths of stay have some statistics substantially different from the whole sample. First, nearly 70% of the subsample of 5+ years in care experienced early childhood maltreatment, which is 20% higher than the whole sample, and 30% higher than the subsample of no more than 5 years in care. It is not surprising, since those of 5+ years in care entered care at least 5 years before 14 years of age, which means that they were most likely to have experienced maltreatment at an early age. Second, 95.05% the subsample of 5+ years in care were African American, which is 5% higher than the whole sample, and 8% higher than the subsample of no more than 5 years in care. Previous literature also reported that African Americans tend to stay in care longer than other races (Courtney & Wong, 1996). Third, the subsample of 5+ years in care had more neglect cases but fewer risk of harm cases than the whole sample, while the subsample of no more than 5 years in care had fewer neglect cases but

more risk of harm cases than the whole sample. Fourth, the subsample of 5+ years in care had fewer cases of one placement only than the whole sample, while the subsample of no more than 5 years in care had more cases of one placement only than the whole sample. This is not surprising, since foster youths in care for longer times are likely to experience placement change.

The descriptive analysis of numeric variables is displayed in Table 5. To be consistent with the earlier presentation, I showed the results of each sample separately. Regarding the whole sample, each youth had, on average, 2.07 different maltreatment report dates of indicated allegations. This measures the persistence of maltreatment experiences. On average, the youths lived in neighborhoods with 32% of the residents living below the poverty line, 28% of the residents on public assistance, 34% female-headed families, 21% unemployment rate, 32% of the residents less than 18 years of age, 80% African American residents, 10% Hispanic residents, 6% foreign born residents, 60% of the residents living in the same house as in 1985, and 39% owner-occupied houses. As for the neighborhood social processes, neighborhoods of the whole sample scored 6.97 on collective efficacy, 2.01 on neighborhood disorder, and 2.56 on violent culture. To provide context for understanding the results, I will compare neighborhood variables between the whole sample and all neighborhoods in Chicago in Table 5.

The subsamples of different lengths of stay show similar results as the whole sample, except that the percentages of African American in the neighborhoods for the subsample of 5+ years in care are 5% higher than the whole sample, and 7% higher than the subsample of no more than 5 years in care. I examined statistical differences between the subsamples and show the results in Table 6.

Table 5. Descriptive analysis of numeric variables

	Whole sample (N=2,360)	5+ years (N=767)	≤5years (N=1,593)
	Mean (std)	Mean (std)	Mean (std)
Maltreatment Report Count	2.07 (1.34)	2.21 (1.40)	2.01 (1.31)
Census Variables			
Below poverty line	0.32 (0.17)	0.33 (0.17)	0.32 (0.17)
On public assistance	0.28 (0.15)	0.30 (0.14)	0.28 (0.15)
Female-headed families	0.34 (0.13)	0.36 (0.12)	0.34 (0.13)
Unemployed	0.21 (0.10)	0.22 (0.09)	0.20 (0.10)
Less than age 18	0.32 (0.07)	0.32 (0.07)	0.32 (0.08)
Black	0.80 (0.33)	0.85 (0.27)	0.78 (0.35)
Hispanic	0.10 (0.20)	0.07 (0.16)	0.11 (0.21)
Foreign born	0.06 (0.11)	0.05 (0.09)	0.07 (0.11)
Same house as in 1985	0.60 (0.11)	0.61 (0.10)	0.59 (0.11)
Owner-occupied house	0.39 (0.22)	0.40 (0.22)	0.38 (0.22)
Neighborhood Social Process			
Collective efficacy	6.97 (0.45)	6.95 (0.45)	6.98 (0.45)
Neighborhood disorder	2.01 (0.27)	2.02 (0.27)	2.00 (0.27)
Violent culture	2.56 (0.12)	2.56 (1.12)	2.55 (0.11)

Table 6. Compare means between the Chicago neighborhoods and the sample neighborhoods

	Chicago (N=343)	Whole sample (N=2,360)	p-value for equal mean test	p-value for equal variance test
	Mean (std)	Mean (std)		
Census Variables				
Below poverty line	0.23 (0.17)	0.32 (0.17)	≤0.001	0.79
On public assistance	0.17 (0.15)	0.28 (0.15)	≤0.001	0.40
Female-headed families	0.23 (0.15)	0.34 (0.13)	≤0.001	≤0.001
Unemployed	0.14 (0.10)	0.21 (0.10)	≤0.001	0.75
Less than age 18	0.27 (0.09)	0.32 (0.07)	≤0.001	≤0.001
Black	0.42 (0.44)	0.80 (0.33)	≤0.001	≤0.001
Hispanic	0.20 (0.26)	0.10 (0.20)	≤0.001	≤0.001
Foreign born	0.17 (0.16)	0.06 (0.11)	≤0.001	≤0.001
Same house as in 1985	0.56 (0.13)	0.60 (0.11)	≤0.001	≤0.001
Owner-occupied house	0.42 (0.24)	0.39 (0.22)	0.01	0.05
Neighborhood Social Process				
collective efficacy	7.24 (0.56)	6.97 (0.45)	≤0.001	≤0.001
disorder	1.83 (0.34)	2.01 (0.27)	≤0.001	≤0.001
violent culture	2.49 (0.13)	2.56 (0.12)	≤0.001	≤0.001

The comparison between all Chicago neighborhoods and the neighborhoods associated with the sample is displayed in Table 6. The first column shows the summary statistics of all 343 neighborhood clusters in the City of Chicago. The second column shows the statistics for the neighborhoods associated with the whole sample. I compared their means using independent sample t-test. In the table, I showed both the p-values of the t-test for equality of means and Levene's test for equality of variances. The t-test for equality of means showed that the means of all variables were significantly different between all Chicago neighborhoods and the neighborhoods associated with the sample. Comparatively, foster youths in the sample lived in neighborhoods of 9% higher poverty rate, 11% higher rate of residents on public assistance, 11% higher rate of female-headed families, 7% higher unemployment rate, 5% higher rate of residents less than 18 years of age, 38% higher rate of Black residents, 10% lower rate of Hispanic residents, 11% lower rate of foreign born residents, 4% higher rate of residents living in the same house as in 1985, and 3% lower rate of owner-occupied houses. For the neighborhood social processes, the neighborhoods associated with the sample scored 0.27 lower on collective efficacy, 0.18 higher on neighborhood disorder, and 0.07 higher on violent culture. In summary, the quality of neighborhoods associated with the sample is significantly below the average of Chicago neighborhoods.

The Levene's test for equality of variances (Table 6) showed that the variances of most variables were significantly different between all Chicago neighborhoods and the neighborhoods associated with the sample. As compared with all Chicago neighborhoods, the neighborhoods associated with the sample had smaller variances on rates of female-headed families, rates of residents less than 18 years of age, rates of African American residents, rates of Hispanic residents, rates of foreign born residents, rates of residents living in the same house as in 1985,

rates of owner-occupied houses, collective efficacy, neighborhood disorder, and violent culture. The smaller variances for the sample indicate that the neighborhoods associated with foster care placements of the sample were more homogeneous. There are limited variances on the neighborhood variables. The neighborhoods associated with the sample clustered at the higher values on most neighborhood variables. When independent variables cluster at the highest values, dependent variables are restricted by ceiling effects (Shadish, Cook, & Campbell, 2002, p. 50), which can threaten the power of this study.

Table 7. Compare means between the subsamples of difference length of stay

	5+ years (N=767)	≤5years (N=1,593)	p-value for equal mean test	p-value for equal variance test
	Mean (std)	Mean (std)		
Maltreatment Report Count	2.21 (1.40)	2.01 (1.31)	≤0.001	0.02
Census Variables				
Below poverty line	0.33 (0.17)	0.32 (0.17)	0.14	0.99
On public assistance	0.30 (0.14)	0.28 (0.15)	≤0.001	0.10
Female-headed families	0.36 (0.12)	0.34 (0.13)	≤0.001	≤0.001
Unemployed	0.22 (0.09)	0.20 (0.10)	≤0.001	0.13
Less than age 18	0.32 (0.07)	0.32 (0.08)	0.12	0.01
Black	0.85 (0.27)	0.78 (0.35)	≤0.001	≤0.001
Hispanic	0.07 (0.16)	0.11 (0.21)	≤0.001	≤0.001
Foreign born	0.05 (0.09)	0.07 (0.11)	≤0.001	≤0.001
Same house as in 1985	0.61 (0.10)	0.59 (0.11)	≤0.001	≤0.01
Owner-occupied house	0.40 (0.22)	0.38 (0.22)	0.16	0.75
Neighborhood Social Process				
collective efficacy	6.95 (0.45)	6.98 (0.45)	0.21	0.71
disorder	2.02 (0.27)	2.00 (0.27)	0.10	0.83
violent culture	2.56 (1.12)	2.55 (0.11)	0.04	0.53

The comparison between the subsample of 5+ years in care and the subsample of no more than 5 years in care is displayed in Table 7. I compared their means using independent sample t-test. In the table, I also showed both the p-values of the t-test for equality of means and Levene's test for equality of variances. The subsample of 5+ years in care had 0.2 more maltreatment

report dates than the subsample of no more than 5 years in care. The t-test for equality of means also showed that as compared with the subsample of no more than 5 years in care, the subsample of 5+ years in care stayed in neighborhoods of 2% higher rate of residents on public assistance, 2% higher rate of female-headed families, 2% higher unemployment rate, 7% higher rate of African American residents, 4% lower rate of Hispanic residents, 2% lower rate of foreign born residents, 2% higher rate of residents living in the same house as in 1985, and 2% lower rate of owner-occupied houses. For the neighborhood social processes, the neighborhoods associated with the subsample of 5+ years in care scored 0.01 higher on violent culture. In summary, the quality of neighborhoods associated with the subsample of 5+ years in care is significantly lower than the subsample of no more than 5 years in care.

The Levene's test for equality of variances (Table 7) showed that the subsamples have significantly different variances on six out of ten census variables. More specifically, the subsample of 5+ years in care had smaller variances on rates of female-headed families, rates of residents less than 18 years of age, rates of African American residents, rates of Hispanic residents, rates of foreign born residents, and rates of residents living in the same house as in 1985. As mentioned earlier, the neighborhoods associated with the sample were relatively homogeneous, which might compromise the power to test neighborhood effects. When splitting the sample, the subsample of 5+ years in care had even smaller variances on several census variables, which indicates that it might be even harder to test neighborhood effects for the subsample of 5+ years in care. Therefore, even though I hypothesized that the magnitude of neighborhoods effects is greater for the subsample 5+ years in care due to the longer time of being exposed to the neighborhoods, it might not show in the results.

Bivariate Analysis

Table 8. Bivariate for the whole sample (N=2,360)

		Delinquency		
	N	No (%)	Yes (%)	p-value
<i>Categorical Variables</i>				
Age at initial maltreatment				0.37
early childhood	1,136	89.00	11.00	
late childhood	1,074	88.18	11.82	
adolescence	150	92.00	8.00	
Gender ***				≤0.001
Female	1,229	94.71	5.29	
Male	1,131	82.40	17.60	
Race *				0.02
African American	2,114	88.22	11.78	
Hispanic	170	94.71	5.29	
Caucasian	76	92.11	7.89	
Maltreatment Type				
sexual abuse *	275	94.18	5.82	≤0.01
physical abuse	330	87.58	12.42	0.44
SEI	34	97.06	2.94	0.07
neglect	1,882	88.52	11.48	0.37
risk of harm	996	89.56	10.44	0.33
Placement Type ***				≤0.001
Congregate care	286	81.47	18.53	
Non-Congregate Care	2,074	89.83	10.17	
Placement Instability ***				≤0.001
one placement	843	91.70	8.30	
two placements	616	89.61	10.39	
three placements	384	86.98	13.02	
four+ placements	517	84.53	15.47	
Length of Stay in Placement				0.80
one year or less	423	87.71	12.29	
>1-2 years	318	89.62	10.38	
>2-5 years	852	89.32	10.68	
>5 years	767	88.53	11.47	
<i>Numeric Variables</i>				
Maltreatment Report Count		2.07	2.08	0.97
<i>Census Variables</i>				
Below poverty line		0.32	0.33	0.62
On public assistance		0.28	0.29	0.72

Table 8 (cont.)

Female-headed families		0.34	0.35	0.29
Unemployed		0.21	0.21	0.39
Less than age 18		0.32	0.32	0.83
Black		0.80	0.81	0.60
Hispanic		0.10	0.09	0.28
Foreign born		0.06	0.07	0.75
Same house as in 1985		0.60	0.60	0.88
Owner-occupied house		0.39	0.38	0.64
Neighborhood Social Process				
collective efficacy		6.97	6.94	0.22
disorder		2.01	2.02	0.46
violent culture		2.56	2.56	0.66

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

The bivariate analysis for the whole sample is displayed in Table 8. The bivariate analysis examined the relationship between individual/neighborhood variables and delinquency. The upper part of the table shows the categorical variables regarding individual background. The p-values were from Fisher's exact test when an expected value is less than 5, and the chi-square otherwise. The bottom part of the table shows the numeric variables regarding the count of dates for indicated maltreatment report and neighborhood measures. The p-values were from the t-test for equality of means. As shown in the table, male foster youths had higher delinquency rate than female foster youths (17.60% vs. 5.29%). Delinquency rates vary with race. African Americans had the highest delinquency rate (11.78%), Caucasians had the second highest delinquency rate (7.89%), and Hispanics had the lowest delinquency rate (5.29%). Two placement related variables are significantly associated with delinquency. Foster youths with congregate care experience had higher delinquency rate than those who did not stay in congregate care (18.53% vs. 10.17%). Placement instability is positively associated with delinquency. The delinquency rate for the foster youths with four or more placements is nearly twice the delinquency rate for the foster youth with one placement only (15.47% vs. 8.30%).

However, the length of stay in placement is not significantly associated with delinquency. None of the maltreatment related variables, age at first indicated maltreatment, maltreatment type, and maltreatment report count, was significant.

The bivariate analysis did not show any significant relationship between neighborhood variables and delinquency. The p-values of the t-test for equality of means were greater than 0.50 for eight out of thirteen neighborhood variables. The smallest p-value is 0.22 for collective efficacy. The delinquent group scored lower on collective efficacy than the non-delinquent group (6.94 vs. 6.97). However, the difference did not reach the threshold of statistical significance.

Table 9. Bivariate for the 5+ years sample (N=767)

	N	No (%)	Yes (%)	p-value
Categorical Variables				
Age at initial maltreatment				0.91
early childhood	525	88.38	11.62	
late childhood	229	88.65	11.35	
adolescence	13	92.31	7.69	
Gender ***				≤0.001
Female	369	93.97	6.03	
Male	398	82.66	17.34	
Race				0.77
African American	729	88.61	11.39	
Hispanic	23	86.96	13.04	
Caucasian	15	86.67	13.33	
Maltreatment Type				
sexual abuse *	88	95.45	4.55	0.03
physical abuse	107	89.72	10.28	0.68
SEI	13	100.00	0.00	0.20
neglect	665	88.27	11.73	0.57
risk of harm	235	90.64	9.36	0.22
Placement Type *				0.02
Congregate care	64	89.33	10.67	
Non-Congregate Care	703	79.69	20.31	
Placement Instability				0.21
one placement	207	92.27	7.73	
two placements	215	88.37	11.63	
three placements	141	85.82	14.18	

Table 9 (cont.)

four+ placements	204	86.76	13.24	
Numeric Variables				
Maltreatment Report Count		2.20	2.30	0.56
Census Variables				
Below poverty line		0.33	0.33	0.91
On public assistance		0.30	0.29	0.74
Female-headed families		0.36	0.36	0.56
Unemployed		0.22	0.21	0.72
Less than age 18		0.32	0.32	0.86
Black		0.85	0.85	0.92
Hispanic		0.07	0.07	0.77
Foreign born		0.05	0.05	0.87
Same house as in 1985		0.61	0.62	0.56
Owner-occupied house		0.40	0.40	0.86
Neighborhood Social Process				
collective efficacy		6.95	6.93	0.71
disorder		2.02	2.02	0.96
violent culture		2.56	2.56	0.84

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

The bivariate analysis for the subsample of 5+ years in care is displayed in Table 9. As compared with the whole sample, fewer variables were statistically significant in this analysis. Only gender and placement type were still statistically significant. As shown in the table, male foster youths had higher delinquency rates than female foster youths (17.34% vs. 6.03%). Foster youths with congregate care experience had higher delinquency rates than those who did not stay in congregate care (20.31% vs. 10.67%). Unlike the whole sample, race and placement instability were no longer significant. It is worth noting that there were even smaller percentages of Hispanics and Caucasians in this subsample than in the whole sample. Less than five percent of the subsample were Hispanic or Caucasian. Therefore, caution should be exercised when making inferences about the absence of racial differences in delinquency rates. Similar to the whole sample, none of the maltreatment related variables, age at first indicated maltreatment, maltreatment type, and the count of maltreatment report dates, was significant.

The bivariate analysis did not show any significant relationship between neighborhood variables and delinquency.

Table 10. Bivariate for the ≤ 5 years sample (N=1,593)

	N	No (%)	Yes (%)	p-value
Categorical Variables				
Age at initial maltreatment				0.34
early childhood	611	89.53	10.47	
late childhood	845	88.05	11.95	
adolescence	137	91.97	8.03	
Gender ***				≤ 0.001
Female	831	95.07	4.93	
Male	762	82.28	17.72	
Race **				≤ 0.01
African American	1,385	88.01	11.99	
Hispanic	147	95.92	4.08	
Caucasian	61	93.44	6.56	
Maltreatment Type				
sexual abuse *	187	93.58	6.42	0.03
physical abuse	223	86.55	13.45	0.22
SEI	21	95.24	4.76	0.35
neglect	1,217	88.66	11.34	0.51
risk of harm	761	89.22	10.78	0.74
Placement Type ***				≤ 0.001
Congregate care	222	90.08	9.92	
Non-Congregate Care	1,371	81.98	18.02	
Placement Instability ***				≤ 0.001
one placement	636	91.51	8.49	
two placements	401	90.27	9.73	
three placements	243	87.65	12.35	
four+ placements	313	83.07	16.93	
Length of Stay in Placement				0.63
one year or less		87.71	12.29	
>1-2 years		89.62	10.38	
>2-5 years		89.32	10.68	
>5 years				
Numeric Variables				
Maltreatment Report Count		2.01	1.97	0.67
Census Variables				
Below poverty line		0.32	0.33	0.50

Table 10 (cont.)

On public assistance		0.28	0.28	0.53
Female-headed families		0.34	0.35	0.39
Unemployed		0.20	0.21	0.21
Less than age 18		0.32	0.32	0.72
Black		0.77	0.79	0.53
Hispanic		0.11	0.10	0.34
Foreign born		0.07	0.08	0.64
Same house as in 1985		0.59	0.59	0.81
Owner-occupied house		0.39	0.37	0.47
Neighborhood Social Process				
collective efficacy		6.98	6.94	0.22
disorder		2.00	2.02	0.39
violent culture		2.55	2.56	0.51

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

The bivariate analysis for the subsample of no more than 5 years in care is displayed in Table 10. The results are very similar to the whole sample. As shown in the table, male foster youths had higher delinquency rates than female foster youths (17.72% vs. 4.93%). Delinquency rates vary with race. African Americans had the highest delinquency rate (11.99%), Caucasians had the second highest delinquency rate (6.56%), and Hispanics had the lowest delinquency rate (4.08%). Two placement related variables are significantly associated with delinquency. Foster youths with congregate care experiences had higher delinquency rates than those who did not stay in congregate care (18.02% vs. 9.92%). Placement instability is positively associated with delinquency. The delinquency rate for the foster youths with four or more placements is nearly twice the delinquency rate for the foster youth with one placement only (16.93% vs. 8.49%). However, the length of stay in placement is not significantly associated with delinquency. None of the maltreatment related variables, age at first indicated maltreatment, maltreatment type, and count of maltreatment report dates, was significant.

The bivariate analysis did not show any significant relationship between neighborhood variables and delinquency. The p-values of the t-test for equality of means were greater than 0.50 for eight out of thirteen neighborhood variables. The smallest p-value is 0.22 for collective efficacy.

Path Analysis

Path analysis modeling delinquency in general

I first modeled delinquency petition using collective efficacy as the mediator, and regressed collective efficacy on three neighborhood sociodemographic factors. Most of model fit indices show a good fit except for WRMR (RMSEA=0.04, CFI=0.98, TLI=0.95, WRMR=1.23). The WRMR of this model is greater than the preferable value of 0.90. To improve the model fit, I checked modification indices, which indicate the amount of chi-square changes when the specific parameters are estimated as part of the model (Muthen, 2006). The modification index equal to or greater than 3.84 indicates a significant change on chi square values for one degree of freedom. For my first model, modification indices provided by Mplus indicated that model fit would improve if adding the regression of collective efficacy on African Americans (MI=27.74).

Existing literature on the relationship between race and using kinship care provide theoretical support to the hypothesis that race is associated with the neighborhoods in which foster youths were placed. African American children are more likely to stay in proximity to their parents' neighborhoods, since many of them entered kinship foster care. In this sample, 88% of African Americans stayed in kinship foster care for at least one episode.

The substantial growth of kinship foster care occurred between 1986 and 1994, around the time when the study sample was in care. Testa (1997) provided a historical review of kinship

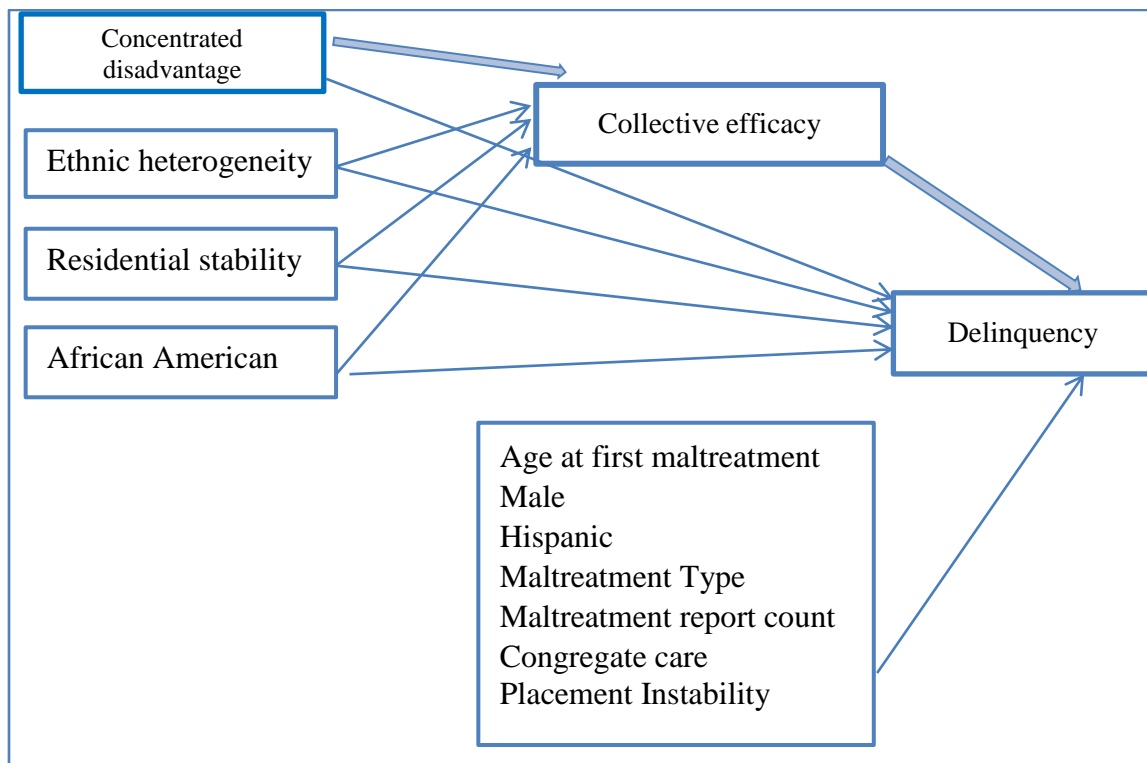
foster care in Illinois. According to his review, since Illinois DCFS extended full foster care benefits to all wards in relative placements, in response to the *Miller v. Youakim* decision, the number of children in kinship care increased almost 500% between 1986 and 1994. Comparatively, the number of children in other types of foster care increased around 80% during the same period of time. As a result, kinship care counted for 55% of foster care placements as of June 1994. Testa noted that “kinship placements in Chicago rose disproportionately among African-Americans” (P 116). The original informal kinship care in African American families, such as “grandmother cases” became incorporated into the formal foster care system. Testa estimated that 41% of first placements with relatives in Cook County were non-removals. Among all foster care placements, 45% of first placements were within five miles of the children’s parents’ addresses. A multivariate study (Grogan-Kaylor, 2000) also reported that African Americans are more likely to enter kinship foster care than other races. Given that many foster children come from neighborhoods of high poverty rates and other disadvantages, the foster care placements in proximity are also more likely to locate in disadvantaged neighborhoods. Several studies (Gibbs & Müller, 2000; Schwartz, 2005) reported that neighborhoods of kinship placements usually show high poverty rates, obvious social and physical disorders, violence, drug use, and drug dealing. A comparison of neighborhood social process between different race groups in this study is displayed in Table 11, which also indicates that African American foster children stayed in neighborhoods with significantly lower collective efficacy, higher neighborhood disorder, and higher levels of violent culture.

Table 11. Comparison of neighborhood social process between race groups (N=2,360)

	African American (N=2,114)	Non-African American (N=246)	p-value for equal mean test
Neighborhood social process			
Collective efficacy	6.94	7.19	<0.001
Neighborhood disorder	2.03	1.87	<0.001
Violent culture	2.56	2.51	<0.001

I therefore decided to modify the model by adding the regression of collective efficacy on African Americans. The revised model is shown in Figure 18. For the purpose of comparing results from different models, I include this regression in all the models. Including this regression will answer the question whether racial differences on delinquency are mediated by neighborhood.

Figure 18. Revised path model



The revised model shows better model fit indices (RMSEA=0.02, CFI=1.00, TLI=0.99, WRMR=0.77). The variance explained in overall delinquency is 14% and collective efficacy is 57%. According to Cohen (1988), the benchmarks for small, medium, and large effect size for R^2 are 0.02, 0.13, and 0.26, respectively. Therefore, the R^2 for overall delinquency is medium, and for collective efficacy is large.

The standardized path coefficients are displayed in Table 12. Since the models examine both the direct and indirect effects of neighborhood sociodemographics, I show them separately in two different columns. Only the four rows for African American and neighborhood sociodemographic factors have both columns filled.

Table 12. Path analysis modeling delinquency with collective efficacy as mediator

Variables	Whole sample (N=2,360)		5+ years sample (N=767)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect	direct	indirect
Probit regression on delinquency						
African American	0.36	0.00	-0.13	0.01	0.53	0.00
Neighborhood sociodemographics						
Concentrated disadvantage	0.00	0.02	-0.05	0.05	0.02	0.01
Ethnic heterogeneity	0.08	0.00	-0.02	0.01	0.13*	0.00
Residential stability	0.00	-0.01	0.05	-0.02	-0.02	-0.01
Neighborhood mediator						
Collective efficacy	-0.03		-0.07		-0.02	
Individual characteristics						
Age at first maltreatment (Reference: Early childhood)						
Late childhood	0.01		0.02		0.01	
Adolescence	-0.22		-0.31		-0.23	
Male	0.63***		0.58***		0.66***	
Race (Reference: White)						
Hispanic	-0.22		0.10		-0.28	
Maltreatment type						
Physical abuse	0.02		-0.13		0.11	
Neglect	-0.01		-0.02		0.00	
Maltreatment report count	-0.02		0.04		-0.05	
Congregate care	0.17		0.40		0.07	

Table 12 (cont.)

Placement instability (Reference: One placement)						
Two placements	0.11		0.19		0.09	
Three placements	0.20		0.25		0.19	
Four + placements	0.28**		0.17		0.37**	
Linear regression on mediator						
Concentrated disadvantage	-0.63***		-0.66***		-0.63***	
Ethnic heterogeneity	-0.12***		-0.12***		-0.11***	
Residential stability	0.26***		0.22***		0.27***	
Black	-0.12***		-0.10**		-0.14***	
R Square						
Delinquency	0.14		0.12		0.18	
Collective efficacy	0.57		0.58		0.57	
Model fit						
RMSEA	0.02		0.00		0.02	
CFI	1.00		1.00		0.99	
TLI	0.99		1.03		0.98	
WRMR	0.77		0.39		0.77	

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

For the whole sample, none of the neighborhood sociodemographic factors showed significant effects on delinquency. Collective efficacy, the mediator, was also not significant in the model. Two individual variables were significantly associated with delinquency. Male foster youths are more likely to offend than female foster youths ($\beta = 0.63$, $p \leq 0.001$). The interpretation of coefficients in probit model is not as straightforward as linear regression. Unlike logit model, the coefficient in probit model cannot be directly reported as changes on odds ratio. Therefore, I manually calculated the average effects of each significant variable with setting the other significant variables at their mean, which is a common practice (Long, 1997). I also had to use unstandardized coefficients that are not reported in the table for the calculations. For example, the effect of being a male is:

$$pr(y = 1|male = 0) = \Phi(0.681 \times 0 + 0.307 \times 0.22^1) = \Phi(0.07) = 0.52790$$

¹ The mean of four+ placement, the other significant variable is 0.22.

$$pr(y = 1|male = 1) = \Phi(0.681 \times 1 + 0.307 \times 0.22) = \Phi(0.75) = 0.77337$$

$$0.77337 - 0.52790 = 0.24547$$

So the probability of delinquency is 0.25 higher for male foster youths than for female foster youths. Using the same approach, the effect of four+ placements can be interpreted as follows: four+ placements is associated with 0.11² higher probability of delinquency as compared with foster youths with one placement experience only.

In the regression on collective efficacy, the mediator, three neighborhood sociodemographic factors, and being African American were all significant. Each standard deviation increase on concentrated disadvantage is associated with a 0.63 standard deviation decrease on collective efficacy. Each standard deviation increase on ethnic heterogeneity is associated with a 0.12 standard deviation decrease on collective efficacy. Each standard deviation increase on residential stability is associated with a 0.26 standard deviation increase on collective efficacy. African American foster youths are associated with a 0.12 standard deviation lower on collective efficacy than foster youths of other races.

As mentioned earlier, I ran the same model for two subsamples separately to examine the moderation effect of length of stay. I hypothesized that neighborhood effects of the longer stay subsample are more likely to be statistically significant and have greater magnitude. To facilitate the comparison, I presented the results of both subsamples on the right columns of the same table as the whole sample. Surprisingly, the subsample of 5+ years in care did not show any significant neighborhood effects on delinquency, while the subsample of no more than 5 years in care showed a significant neighborhood effect of ethnic heterogeneity. Ethnic heterogeneity is

² The calculation is as follows:

$$\begin{aligned} pr(y = 1|four + pl = 0) &= \Phi(0.681 \times 0.48 + 0.307 \times 0) = \Phi(0.33) = 0.62930 \\ pr(y = 1|four + pl = 1) &= \Phi(0.681 \times 0.48 + 0.307 \times 1) = \Phi(0.63) = 0.73565 \\ 0.73565 - 0.62930 &= 0.10635 \end{aligned}$$

positively associated with delinquency. Using the sample approach as mentioned above, the effect of ethnic heterogeneity can be interpreted as follows: each standard deviation increase on ethnic heterogeneity is associated with a 0.05³ higher probability of delinquency.

To compare results across samples, I will report on the unstandardized coefficients in the text, since unstandardized coefficients rather than standardized coefficients should be used for cross sample comparison (Stage, Carter, & Nora, 2004). The coefficient for males varies among samples. As compared with the whole sample, the coefficient for males is smaller in the subsample of 5+ years in care (0.29 vs. 0.32), and slightly er in the subsample of no more than 5 years in care (0.33 vs. 0.32). That is, gender difference on overall delinquency is greater for foster youths who stay in care for shorter time. Gender difference decreases as foster youth stay in care for over 5 years. Another difference across samples is the findings on placement instability. The subsample of 5+ years in care did not show a significant effect of four+ placements. In other words, placement instability is significantly associated with overall delinquency for foster youths who stayed in care for more than five years.

The results of the regression on collective efficacy showed consistent results in three samples. The three neighborhood sociodemographic factors and being African American consistently showed significant effects on collective efficacy. That is, concentrated disadvantage, ethnic heterogeneity, and being African American were negatively associated with collective efficacy, while residential stability was positively associated with collective efficacy.

³ The calculation is as follows:

$$pr(y = 1|ethnic\ heterogeneity = 0) = \Phi(0.681 \times 0.48 + 0.307 \times 0.20 + 0.136 \times 0) = \Phi(0.39) \\ = 0.65173$$

$$pr(y = 1|ethnic\ heterogeneity = 1) = \Phi(0.681 \times 0.48 + 0.307 \times 0.20 + 0.136 \times 1) = \Phi(0.52) \\ = 0.69847$$

$$0.69847 - 0.65173 = 0.04674$$

The results of testing neighborhood disorder as the mediator are displayed in Table 13. The model fit indices show good model fit (RMSEA=0.02, CFI=1.00, TLI=0.99, WRMR=0.76). The variance explained in overall delinquency is 14% and neighborhood disorder is 68%, which indicate that the R^2 for overall delinquency is medium, and for neighborhood disorder is large.

Table 13. Path analysis modeling delinquency with neighborhood disorder as mediator

Variables	Whole sample (N=2,360)		5+ years sample (N=767)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect	direct	indirect
Probit regression on delinquency						
African American	0.37	0.00	-0.11	0.00	0.54	0.00
Neighborhood sociodemographics						
Concentrated disadvantage	0.01	0.01	-0.02	0.02	0.03	0.00
Ethnic heterogeneity	0.08	0.00	-0.01	0.00	0.13*	0.00
Residential stability	0.00	0.00	0.04	-0.01	-0.02	0.00
Neighborhood mediator						
Neighborhood disorder	0.01		0.03		0.00	
Individual characteristics						
Age at first maltreatment (Reference: Early childhood)						
Late childhood	0.01		0.02		0.01	
Adolescence	-0.22		-0.31		-0.23	
Male	0.63***		0.58***		0.66***	
Race (Reference: White)						
Hispanic	-0.22		0.11		-0.28	
Maltreatment type						
Physical abuse	0.02		-0.13		0.11	
Neglect	-0.01		-0.02		0.00	
Maltreatment report count	-0.02		0.04		-0.05	
Congregate care	0.16		0.40		0.07	
Placement instability (Reference: One placement)						
Two placements	0.11		0.19		0.09	
Three placements	0.20		0.25		0.19	
Four + placements	0.29**		0.17		0.37**	
Linear regression on mediator						
Concentrated disadvantage	0.76***		0.74***		0.77***	
Ethnic heterogeneity	0.13***		0.10***		0.14***	
Residential stability	-0.19***		-0.19***		-0.19***	
Black	0.09***		0.05		0.11***	

Table 13 (cont.)

R Square			
Delinquency	0.14	0.11	0.18
Neighborhood disorder	0.68	0.68	0.68
Model fit			
RMSEA	0.02	0.02	0.02
CFI	1.00	1.00	1.00
TLI	0.99	0.99	0.99
WRMR	0.76	0.65	0.81

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

Most results were similar to the models of testing collective efficacy as the mediator. For the whole sample, none of the neighborhood sociodemographic factors showed significant effects on delinquency. Neighborhood disorder, the mediator, was also not significant in the model. Two individual characteristic variables were significantly associated with delinquency. Male foster youths are more likely to offend than female foster youths ($\beta = 0.63$, $p \leq 0.001$). Foster youths with four+ placements are more likely to offend than foster youths with one placement experience only ($\beta = 0.29$, $p \leq 0.01$).

In the regression on neighborhood disorder, the mediator, three neighborhood sociodemographic factors and being African American were all significant. Each standard deviation increase on concentrated disadvantage is associated with a 0.76 standard deviation increase on neighborhood disorder. Each standard deviation increase on ethnic heterogeneity is associated with a 0.13 standard deviation increase on neighborhood disorder. Each standard deviation increase on residential stability is associated with a 0.19 standard deviation decrease on neighborhood disorder. African American foster youths are associated with a 0.09 standard deviation higher on neighborhood disorder than foster youths of other races.

The cross sample comparisons also showed similar results as the earlier models of testing collective efficacy as the mediator. Still, the subsample of 5+ years in care did not show any

significant neighborhood effects on delinquency, while the subsample of no more than 5 years in care showed a significant neighborhood effect of ethnic heterogeneity. Ethnic heterogeneity is positively associated with delinquency ($\beta = 0.13, p \leq 0.05$). As compared with the whole sample, gender difference is smaller in the subsample of 5+ years in care (0.29 vs. 0.32), and slightly greater in the subsample of no more than 5 years in care (0.33 vs. 0.32). Another difference across samples is the findings on placement instability. The subsample of 5+ years in care did not show significant effect of four+ placements.

In the regression on neighborhood disorder, the subsample of no more than 5 years in care showed a different result on the relationship between being African American and neighborhood disorder. Unlike the whole sample and the subsample of 5+ years in care, being African American is not significantly associated with neighborhood disorder for foster youths of no more than 5 years in care. The three neighborhood sociodemographic factors were consistently associated with neighborhood disorder.

The results of testing violent culture as the mediator are displayed in Table 14. For the whole sample, the model fit indices show good model fit (RMSEA=0.01, CFI=1.00, TLI=1.00, WRMR=0.59). The variance explained in overall delinquency is 14% and violent culture is 55%, which indicate that the R^2 for overall delinquency is medium, and for violent culture is large.

Most results were similar to the models of testing collective efficacy and neighborhood disorder as the mediators. For the whole sample, none of the neighborhood sociodemographic factors showed significant effects on delinquency. Violent culture, the mediator, was also not significant in the model. Two individual characteristic variables were significantly associated with delinquency. Male foster youths are more likely to offend than female foster youths

($\beta = 0.63$, $p \leq 0.001$). Foster youths with four+ placements are more likely to offend than foster youths with one placement experience only ($\beta = 0.28$, $p \leq 0.01$).

Unlike the regression on the two mediators above, being African American is not significantly associated with the level of neighborhood violent culture. But three neighborhood sociodemographic factors were still significant. Each standard deviation increase on concentrated disadvantage is associated with a 0.74 standard deviation increase on violent culture. Each standard deviation increase on ethnic heterogeneity is associated with a 0.11 standard deviation increase on violent culture. Each standard deviation increase on residential stability is associated with a 0.07 standard deviation decrease on violent culture.

The cross sample comparisons also showed similar results as the earlier models of testing collective efficacy and neighborhood disorder as the mediators. Ethnic heterogeneity is positively associated with delinquency only for the subsample of no more than 5 years in care ($\beta = 0.13$, $p \leq 0.05$). As compared with the whole sample, gender difference is smaller in the subsample of 5+ years in care (0.29 vs. 0.32), and slightly greater in the subsample of no more than 5 years in care (0.33 vs. 0.32). Another difference across samples is the findings on placement instability. The subsample of 5+ years in care did not show significant effect of four+ placements.

In the regression on violent culture, the results were consistent across samples.

Table 14. Path analysis modeling delinquency with violent culture as mediator

Variables	Whole sample (N=2,360)		5+ years sample (N=767)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect	direct	indirect
Probit regression on delinquency						
African American	0.37	0.00	-0.10	0.00	0.53	0.00
Neighborhood sociodemographics						
Concentrated disadvantage	0.02	0.00	0.01	-0.01	0.01	0.02
Ethnic heterogeneity	0.08	0.00	-0.01	0.00	0.13*	0.00

Table 14 (cont.)

Residential stability	-0.01	0.00	0.03	0.00	-0.02	0.00
Neighborhood mediator						
Violent culture	0.00		-0.02		0.02	
Individual characteristics						
Age at first maltreatment (Reference: Early childhood)						
Late childhood	0.01		0.02		0.01	
Adolescence	-0.22		-0.31		-0.23	
Male	0.63***		0.58***		0.66***	
Race (Reference: White)						
Hispanic	-0.22		0.11		-0.28	
Maltreatment type						
Physical abuse	0.02		-0.13		0.11	
Neglect	-0.01		-0.02		0.00	
Maltreatment report count	-0.02		0.04		-0.05	
Congregate care	0.17		0.40		0.07	
Placement instability (Reference: One placement)						
Two placements	0.11		0.19		0.09	
Three placements	0.20		0.25		0.19	
Four + placements	0.28**		0.17		0.37**	
Linear regression on mediator						
Concentrated disadvantage	0.74***		0.68***		0.77***	
Ethnic heterogeneity	0.11***		0.08*		0.13***	
Residential stability	-0.07***		-0.12***		-0.06**	
Black	0.04		0.04		0.04	
R Square						
Delinquency		0.14		0.11		0.18
Violent culture		0.55		0.53		0.56
Model fit						
RMSEA		0.01		0.00		0.02
CFI		1.00		1.00		1.00
TLI		1.00		1.04		0.99
WRMR		0.59		0.41		0.74

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

Path analysis modeling drug offenses

The results of testing collective efficacy as the mediator are displayed in Table 15. For the whole sample, the model fit indices show good model fit (RMSEA=0.02, CFI=1.00,

TLI=0.99, WRMR=0.77). The variance explained in drug offenses is 20% and collective efficacy is 57%, which indicate that the R^2 for drug offenses is medium, and for collective efficacy is large.

Table 15. Path analysis modeling drug offenses with collective efficacy as mediator

Variables	Whole sample (N=2,360)		5+ years sample (N=767)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect	direct	indirect
Probit regression on drug offenses						
African American	0.35	0.01	-0.62	0.01	1.75	0.00
Neighborhood sociodemographics						
Concentrated disadvantage	0.00	0.04	-0.02	0.10	0.00	0.01
Ethnic heterogeneity	-0.01	0.01	-0.10	0.02	0.02	0.00
Residential stability	-0.07	-0.02	0.01	-0.03	-0.07	-0.01
Neighborhood mediator						
Collective efficacy	-0.07		-0.15		-0.02	
Individual characteristics						
Age at first maltreatment (Reference: Early childhood)						
Late childhood	0.08		-0.02		0.10	
Adolescence	-0.04		-0.09		0.04	
Male	0.70***		0.61*		0.45***	
Race (Reference: White)						
Hispanic	-0.17		-0.02		-0.89***	
Maltreatment type						
Physical abuse	-0.07		-0.14		-0.01	
Neglect	0.16		0.17		0.10	
Maltreatment report count	-0.07		-0.10		-0.03	
Congregate care	0.02		0.05		0.02	
Placement instability (Reference: One placement)						
Two placements	0.08		0.29		0.00	
Three placements	0.28		0.34		0.19	
Four + placements	0.29		0.38		0.17	
Linear regression on mediator						
Concentrated disadvantage	-0.63***		-0.66***		-0.63***	
Ethnic heterogeneity	-0.12***		-0.12***		-0.11***	
Residential stability	0.26***		0.22***		0.27***	
Black	-0.12***		-0.10**		-0.14***	
R Square						
Drug offenses	0.20		0.17		0.73	

Table 15 (cont.)

Collective efficacy	0.57	0.58	0.57
Model fit			
RMSEA	0.02	1.00	0.02
CFI	1.00	1.03	0.99
TLI	0.99	0.39	0.98
WRMR	0.77	0.00	0.77

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

For the whole sample, only one variable is significantly associated with drug offenses. None of the neighborhood sociodemographic factors were significant. Collective efficacy, the mediator, was also not significant in the model. Only one individual characteristic variable was significantly associated with drug offenses. Male foster youths are more likely to commit drug offenses than female foster youths ($\beta = 0.70$, $p \leq 0.001$). Placement instability, which was significant in modeling delinquency in general, was not significant here.

The regression on collective efficacy shows the same results as Table 12, which models overall delinquency with testing collective efficacy as the mediator. Three neighborhood sociodemographic factors and being African American were all significantly associated with the level of neighborhood collective efficacy. Each standard deviation increase on concentrated disadvantage is associated with a 0.63 standard deviation decrease on collective efficacy. Each standard deviation increase on ethnic heterogeneity is associated with a 0.12 standard deviation decrease on collective efficacy. Each standard deviation increase on residential stability is associated with a 0.26 standard deviation increase on collective efficacy. African American foster youths are associated with a 0.12 standard deviation lower on collective efficacy than foster youths of other races.

The cross sample comparisons showed three differences. First, as compared with the whole sample, gender difference is smaller in the subsample of 5+ years in care (0.67 vs. 0.78),

and greater in the subsample of no more than 5 years in care (0.88 vs. 0.78). Second, the finding on Hispanics varies with the sample. Hispanics are less likely to commit drug offenses than Caucasians only for the subsample of no more than 5 years in care ($\beta = -0.89$, $p \leq 0.001$). Third, the R^2 for drug offenses for the subsample of no more than 5 years in care is as large as 0.73, which is much greater than the other two samples.

The results of testing neighborhood disorder as the mediator are displayed in Table 16. For the whole sample, the model fit indices show good model fit (RMSEA=0.02, CFI=1.00, TLI=0.99, WRMR=0.76). The variance explained in drug offenses is 20% and neighborhood disorder is 68%, which indicate that the R^2 for drug offenses is medium, and for neighborhood disorder is large.

Table 16. Path analysis modeling drug offenses with neighborhood disorder as mediator

Variables	Whole sample (N=2,360)		5+ years sample (N=767)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect	direct	indirect
Probit regression on drug offenses						
African American	0.33	0.01	-0.58	0.01	1.75	0.01
Neighborhood sociodemographics						
Concentrated disadvantage	-0.07	0.11*	-0.11	0.19*	-0.02	0.03
Ethnic heterogeneity	-0.02	0.02**	-0.10	0.03*	0.02	0.01
Residential stability	-0.06	-0.03*	0.02	-0.05*	-0.06	-0.01
Neighborhood mediator						
Neighborhood disorder	0.14*		0.25*		0.04	
Individual characteristics						
Age at first maltreatment (Reference: Early childhood)						
Late childhood	0.08		-0.02		0.10	
Adolescence	-0.04		-2.63		0.04	
Male	0.70***		0.57*		0.45***	
Race (Reference: White)						
Hispanic	-0.18		-0.01		-0.89***	
Maltreatment type						
Physical abuse	-0.07		-0.13		-0.01	
Neglect	0.17		0.15		0.10	
Maltreatment report count	-0.09		-0.13		-0.04	

Table 16 (cont.)

Congregate care	0.02		0.04		0.02	
Placement instability (Reference: One placement)						
Two placements	0.08		0.27		0.00	
Three placements	0.28		0.32		0.19	
Four + placements	0.29		0.35		0.17	
Linear regression on mediator						
Concentrated disadvantage	0.76***		0.74***		0.77***	
Ethnic heterogeneity	0.13***		0.10***		0.14***	
Residential stability	-0.19***		-0.19***		-0.19***	
Black	0.09***		0.05		0.11***	
R Square						
Drug offenses	0.20		0.28		0.73	
Neighborhood disorder	0.68		0.68		0.68	
Model fit						
RMSEA	0.02		0.02		0.02	
CFI	1.00		1.00		1.00	
TLI	0.99		0.99		0.99	
WRMR	0.76		0.65		0.81	

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

For the whole sample, four neighborhood variables are all significantly associated with drug offenses. Three neighborhood factors show significant indirect effects, but do not show significant direct effects. Concentrated disadvantage ($\beta = 0.11$, $p \leq 0.05$) and ethnic heterogeneity ($\beta = 0.02$, $p \leq 0.05$) are positively associated with drug offenses. Residential stability ($\beta = -0.03$, $p \leq 0.05$) is negatively associated with drug offenses. Neighborhood disorder, the mediator, is positively associated with drug offenses ($\beta = 0.14$, $p \leq 0.05$). Only one individual characteristic variable was significantly associated with delinquency. Male foster youths are more likely to commit drug offenses than female foster youths ($\beta = 0.70$, $p \leq 0.001$).

The regression on neighborhood disorder shows the same results as Table 13, which models overall delinquency with testing neighborhood disorder as the mediator. Three

neighborhood sociodemographic factors were all significantly associated with neighborhood disorder. Each standard deviation increase on concentrated disadvantage is associated with a 0.76 standard deviation increase on neighborhood disorder. Each standard deviation increase on ethnic heterogeneity is associated with a 0.13 standard deviation increase on neighborhood disorder. Each standard deviation increase on residential stability is associated with a 0.19 standard deviation decrease on neighborhood disorder. Being African American foster youths is positively associated with neighborhood disorder ($\beta = 0.09$, $p \leq 0.001$).

This is the first model that shows indirect effects of neighborhood factors. The neighborhood effects can be interpreted as follows: neighborhoods with higher concentrated disadvantage, higher ethnic heterogeneity, and lower residential stability are more likely to show neighborhood disorder, which places foster youths in these neighborhoods at higher risk of being involved in drug offenses.

The cross sample comparisons showed five differences. First, neighborhood variables, both sociodemographic factors and neighborhood disorder, are not significantly associated with drug offenses for the subsample of no more than 5 years in care. Second, as compared with the whole sample, gender difference is smaller in the subsample of 5+ years in care (0.67 vs. 0.78), and greater in the subsample of no more than 5 years in care (0.88 vs. 0.78). Third, the finding on Hispanics varies with sample. Hispanics are less likely to commit drug offenses than Caucasians only for the subsample of no more than 5 years in care ($\beta = -0.89$, $p \leq 0.001$). Fourth, being African American are not significantly associated with living in disordered neighborhoods for the subsample of 5+ years in care. Fifth, the R^2 for drug offenses for the subsample of no more than 5 years in care is as large as 0.73, which is much greater than the other two samples.

The results of testing violent culture as the mediator are displayed in Table 17. For the whole sample, the model fit indices show good model fit (RMSEA=0.01, CFI=1.00, TLI=1.00, WRMR=0.59). The variance explained in drug offenses is 20% and violent culture is 57%, which indicates that the R^2 for drug offenses is medium, and for violent culture is large.

Table 17. Path analysis modeling drug offenses with violent culture as mediator

Variables	Whole sample (N=2,360)		5+ years sample (N=767)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect	direct	indirect
Probit regression on drug offenses						
African American	0.36	0.01	-0.54	0.01	1.71	0.00
Neighborhood sociodemographics						
Concentrated disadvantage	-0.04	0.08	0.00	0.08	-0.04	0.06
Ethnic heterogeneity	-0.01	0.01	-0.08	0.01	0.01	0.01
Residential stability	-0.08	-0.01	-0.01	-0.01	-0.07	0.00
Neighborhood mediator						
Violent culture	0.11		0.11		0.08	
Individual characteristics						
Age at first maltreatment (Reference: Early childhood)						
Late childhood	0.08		-0.02		0.10	
Adolescence	-0.04		-2.63		0.04	
Male	0.70***		0.57*		0.46***	
Race (Reference: White)						
Hispanic	-0.18		-0.01		-0.91***	
Maltreatment type						
Physical abuse	-0.07		-0.13		-0.01	
Neglect	0.16		0.15		0.10	
Maltreatment report count	-0.09		-0.13		-0.05	
Congregate care	0.02		0.04		0.02	
Placement instability (Reference: One placement)						
Two placements	0.08		0.27		0.00	
Three placements	0.28		0.32		0.19	
Four + placements	0.29		0.35		0.17	
Linear regression on mediator						
Concentrated disadvantage	0.74***		0.68***		0.77***	
Ethnic heterogeneity	0.11***		0.08*		0.13***	
Residential stability	-0.07***		-0.12***		-0.06**	
Black	0.04		0.04		0.04	

Table 17 (cont.)

R Square			
Drug offenses	0.20	0.26	0.72
Violent culture	0.55	0.53	0.56
Model fit			
RMSEA	0.01	0.00	0.02
CFI	1.00	1.00	1.00
TLI	1.00	1.04	0.99
WRMR	0.59	0.40	0.74

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

For the whole sample, only one variable is significantly associated with drug offenses. None of the neighborhood sociodemographic factors were significant. Violent culture, the mediator, was also not significant in the model. Only one individual characteristic variable was significantly associated with delinquency. Male foster youths are more likely to commit drug offenses than female foster youths ($\beta = 0.70$, $p \leq 0.001$).

The regression on violent culture shows the same results as Table 14, which models overall delinquency with testing violent culture as the mediator. Three neighborhood sociodemographic factors are all significantly associated with the level of violent culture. Being African American is not significantly associated with living in the neighborhoods of prevalent violent culture.

The cross sample comparisons showed three differences. First, as compared with the whole sample, gender difference is smaller in the subsample of 5+ years in care (0.67 vs. 0.78), and greater in the subsample of no more than 5 years in care (0.88 vs. 0.78). Second, the finding on Hispanics varies with sample. Hispanics are less likely to commit drug offenses than Caucasians only for the subsample of no more than 5 years in care ($\beta = -0.91$, $p \leq 0.001$). Third, the R^2 for drug offenses for the subsample of no more than 5 years in care is as large as 0.72, which is much greater than the other two samples.

Path analysis modeling violent offenses

The results of testing collective efficacy as the mediator are displayed in Table 18. For the whole sample, the model fit indices show good model fit (RMSEA=0.02, CFI=1.00, TLI=0.99, WRMR=0.77). The variance explained in violent offenses is 13% and collective efficacy is 57%, which indicate that the R^2 for violent offenses is medium, and for collective efficacy is large.

Table 18. Path analysis modeling violent offenses with collective efficacy as mediator

Variables	Whole sample (N=2,360)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect
Probit regression on violent offenses				
African American	0.51	-0.01	0.43	0.00
Neighborhood sociodemographics				
Concentrated disadvantage	0.10	-0.04	0.08	-0.01
Ethnic heterogeneity	0.15*	-0.01	0.18*	0.00
Residential stability	0.07	0.02	0.03	0.01
Neighborhood mediator				
Collective efficacy	0.07		0.02	
Individual characteristics				
Age at first maltreatment (Reference: Early childhood)				
Late childhood	-0.08		-0.17	
Adolescence	-0.33		-0.51	
Male	0.38***		0.41***	
Race (Reference: White)				
Hispanic	-0.61		-0.67	
Maltreatment type				
Physical abuse	0.17		0.23	
Neglect	-0.09		-0.11	
Maltreatment report count	0.01		-0.12	
Congregate care	0.28*		0.23	
Placement instability (Reference: One placement)				
Two placements	0.06		0.05	
Three placements	0.16		0.10	
Four + placements	0.18		0.19	
Linear regression on mediator				
Concentrated disadvantage	-0.63***		-0.63***	

Table 18 (cont.)

Ethnic heterogeneity	-0.12***		-0.11***	
Residential stability	0.26***		0.27***	
Black	-0.12***		-0.14***	
R Square				
Violent offenses	0.13		0.16	
Collective efficacy	0.57		0.57	
Model fit				
RMSEA	0.02		0.02	
CFI	1.00		0.99	
TLI	0.99		0.98	
WRMR	0.77		0.77	

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

For the whole sample, one neighborhood variable and two individual characteristic variables are significantly associated with violent offenses. Ethnic heterogeneity has direct effect on violent offenses. That is, ethnic heterogeneity is positively associated with violent offenses ($\beta = 0.15$, $p \leq 0.05$). Male foster youths are more likely to commit violent offenses than female foster youths ($\beta = 0.38$, $p \leq 0.001$). Foster youths with congregate care experience are more likely to commit violent offenses than those with no congregate care experience ($\beta = 0.28$, $p \leq 0.05$).

The regression on collective efficacy shows the same results as Table 12, which models overall delinquency with testing collective efficacy as the mediator. Three neighborhood sociodemographic factors and being African American were all significantly associated with the level of neighborhood collective efficacy. Each standard deviation increase on concentrated disadvantage is associated with a 0.63 standard deviation decrease on collective efficacy. Each standard deviation increase on ethnic heterogeneity is associated with a 0.12 standard deviation decrease on collective efficacy. Each standard deviation increase on residential stability is associated with a 0.26 standard deviation increase on collective efficacy. Being African

American foster youths is associated with a 0.12 standard deviation lower on collective efficacy than foster youths of other races.

I also intended to compare the results of the three samples. However, the model did not run for the subsample of 5+ years in care. The weight matrix part of violent offenses is non-invertible due to the empty cell in the crosstab of African American and violent offenses, as shown in Table 19. I was only able to compare the results between the whole sample and the subsample of no more than 5 years in care. All models in this section were compared between these two samples.

Table 19. Crosstab of race and violent offenses (N=767)

	N	No (%)	Yes (%)
African American	729	95.06	4.94
Non-African American	38	100	0

The comparison shows two differences. First, as compared with the whole sample, gender difference is greater in the subsample of no more than 5 years in care (0.45 vs. 0.40), which is consistent with earlier models. Second, congregate care is not significant in the model for in the subsample of no more than 5 years in care.

The results of testing neighborhood disorder as the mediator are displayed in Table 20. For the whole sample, the model fit indices show good model fit (RMSEA=0.02, CFI=1.00, TLI=0.99, WRMR=0.76). The variance explained in violent offenses is 14% and neighborhood disorder is 68%, which indicate that the R^2 for violent offenses is medium, and for neighborhood disorder is large.

Table 20. Path analysis modeling violent offenses with neighborhood disorder as mediator

Variables	Whole sample (N=2,360)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect
Probit regression on violent offenses				
African American	0.52	-0.01	0.44	-0.01
Neighborhood sociodemographics				
Concentrated disadvantage	0.17*	-0.11	0.12	-0.06
Ethnic heterogeneity	0.16*	-0.02	0.19*	-0.01
Residential stability	0.06	0.03	0.03	0.01
Neighborhood mediator				
Neighborhood disorder	-0.14		-0.07	
Individual characteristics				
Age at first maltreatment (Reference: Early childhood)				
Late childhood	-0.08		-0.17	
Adolescence	-0.33		-0.51	
Male	0.38***		0.41***	
Race (Reference: White)				
Hispanic	-0.61		-0.67	
Maltreatment type				
Physical abuse	0.17		0.23	
Neglect	-0.09		-0.11	
Maltreatment report count	0.01		-0.12	
Congregate care	0.28*		0.23	
Placement instability (Reference: One placement)				
Two placements	0.06		0.05	
Three placements	0.16		0.10	
Four + placements	0.18		0.19	
Linear regression on mediator				
Concentrated disadvantage	0.76***		0.77***	
Ethnic heterogeneity	0.13***		0.14***	
Residential stability	-0.19***		-0.19***	
Black	0.09***		0.11***	
R Square				
Violent offenses	0.14		0.16	
Neighborhood disorder	0.68		0.68	
Model fit				
RMSEA	0.02		0.02	
CFI	1.00		1.00	
TLI	0.99		0.99	
WRMR	0.76		0.81	

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

For the whole sample, two neighborhood variables and two individual characteristic variables are significantly associated with violent offenses. Concentrated disadvantage and ethnic heterogeneity has direct effect on violent offenses. That is, both concentrated disadvantage ($\beta = 0.17, p \leq 0.05$) and ethnic heterogeneity ($\beta = 0.16, p \leq 0.05$) are positively associated with violent offenses. It is worth noting that concentrated disadvantaged is marginally significant ($p = 0.05$). Male foster youths are more likely to commit violent offenses than female foster youths ($\beta = 0.38, p \leq 0.001$). Foster youths with congregate care experience are more likely to commit violent offenses than those with no congregate care experience ($\beta = 0.28, p \leq 0.05$).

The regression on neighborhood disorder shows the same results as Table 13, which models overall delinquency with testing neighborhood disorder as the mediator. Three neighborhood sociodemographic factors and being African American were all significantly associated with the level of neighborhood disorder. Each standard deviation increase on concentrated disadvantage is associated with a 0.76 standard deviation increase on neighborhood disorder. Each standard deviation increase on ethnic heterogeneity is associated with a 0.13 standard deviation increase on neighborhood disorder. Each standard deviation increase on residential stability is associated with a 0.19 standard deviation decrease on neighborhood disorder. Being African American foster youths is associated with a 0.09 standard deviation higher on neighborhood disorder than foster youths of other races.

The comparison between the whole sample and the subsample of no more than 5 years in care shows three differences. First, concentrated disadvantage is not significant ($p = 0.25$) in the model for the subsample of no more than 5 years in care. Second, as compared with the whole sample, gender difference is greater in the subsample of no more than 5 years in care (0.45

vs. 0.40), which is consistent with earlier models. Third, congregate care is not significant in the model for in the subsample of no more than 5 years in care.

The results of testing violent culture as the mediator are displayed in Table 21. For the whole sample, the model fit indices show good model fit (RMSEA=0.01, CFI=1.00, TLI=0.99, WRMR=0.59). The variance explained in violent offenses is 14% and violent culture is 55%, which indicate that the R^2 for violent offenses is medium, and for violent culture is large.

Table 21. Path analysis modeling violent offenses with violent culture as mediator

Variables	Whole sample (N=2,360)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect
Probit regression on violent offenses				
African American	0.50	-0.01	0.44	-0.01
Neighborhood sociodemographics				
Concentrated disadvantage	0.16*	-0.11*	0.17*	-0.10
Ethnic heterogeneity	0.15*	-0.02*	0.19*	-0.02
Residential stability	0.08	0.01*	0.03	0.01
Neighborhood mediator				
Violent culture	-0.14*		-0.14	
Individual characteristics				
Age at first maltreatment (Reference: Early childhood)				
Late childhood	-0.08		-0.17	
Adolescence	-0.33		-0.51	
Male	0.38***		0.41***	
Race (Reference: White)				
Hispanic	-0.61		-0.67	
Maltreatment type				
Physical abuse	0.17		0.23	
Neglect	-0.09		-0.11	
Maltreatment report count	0.01		-0.12	
Congregate care	0.28*		0.23	
Placement instability (Reference: One placement)				
Two placements	0.06		0.05	
Three placements	0.16		0.10	
Four + placements	0.18		0.19	
Linear regression on mediator				
Concentrated disadvantage	0.74***		0.77***	

Table 21 (cont.)

Ethnic heterogeneity	0.11***		0.13***	
Residential stability	-0.07***		-0.06**	
Black	0.04		0.04	
R Square				
Violent offenses	0.14		0.16	
Violent culture	0.55		0.56	
Model fit				
RMSEA	0.01		0.02	
CFI	1.00		0.99	
TLI	1.00		0.98	
WRMR	0.59		0.74	

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

For the whole sample, three neighborhood variables and two individual characteristic variables are significantly associated with violent offenses. Concentrated disadvantage and ethnic heterogeneity has both direct and indirect effects on violent offenses. The total effect for each of them is the sum of direct and indirect effects. That is, both concentrated disadvantage ($\beta = 0.05$, $p \leq 0.05$) and ethnic heterogeneity ($\beta = 0.13$, $p \leq 0.05$) are positively associated with violent offenses ($\beta = -0.14$, $p \leq 0.05$). However, violent culture is negatively associated with violent offenses. Male foster youths are more likely to commit violent offenses than female foster youths ($\beta = 0.38$, $p \leq 0.001$). Foster youths with congregate care experience are more likely to commit violent offenses than those with no congregate care experience ($\beta = 0.28$, $p \leq 0.05$).

The regression on violent culture shows the same results as Table 14, which models overall delinquency with testing neighborhood violent culture as the mediator. Three neighborhood sociodemographic factors were still significant. Each standard deviation increase on concentrated disadvantage is associated with a 0.74 standard deviation increase on violent

culture. Each standard deviation increase on ethnic heterogeneity is associated with a 0.11 standard deviation increase on violent culture. Each standard deviation increase on residential stability is associated with a 0.07 standard deviation decrease on violent culture. Being African American is not significantly associated with the level of neighborhood violent culture.

The comparison between the whole sample and the subsample of no more than 5 years in care shows three differences. First, concentrated disadvantage and ethnic heterogeneity show only direct effects in the model for in the subsample of no more than 5 years in care. Their effects on violent offenses are greater in the model for in the subsample of no more than 5 years in care. Second, as compared with the whole sample, gender difference is greater in the subsample of no more than 5 years in care (0.45 vs. 0.40), which is consistent with earlier models. Third, congregate care is not significant in the model for in the subsample of no more than 5 years in care.

Path analysis modeling property offenses

The results of testing collective efficacy as the mediator are displayed in Table 22. For the whole sample, the model fit indices show good model fit (RMSEA=0.02, CFI=1.00, TLI=0.99, WRMR=0.77). The variance explained in property offenses is 7% and collective efficacy is 57%, which indicate that the R^2 for property offenses is small, and for collective efficacy is large.

Table 22. Path analysis modeling property offenses with collective efficacy as mediator

Variables	Whole sample (N=2,360)		5+ years sample (N=767)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect	direct	indirect
Probit regression on property offenses						
African American	0.00	0.01	-0.37	0.02*	0.12	0.01
Neighborhood sociodemographics						
Concentrated disadvantage	-0.11	0.06	-0.16	0.11**	-0.08	0.04
Ethnic heterogeneity	0.01	0.01	-0.01	0.02*	0.01	0.01

Table 22 (cont.)

Residential stability	-0.01	-0.03	-0.04	-0.04**	-0.01	-0.02
Neighborhood mediator						
Collective efficacy	-0.10		-0.17**		-0.06	
Individual characteristics						
Race (Reference: White)						
Hispanic	-0.05		0.21		-0.12	
Age at first maltreatment (Reference: Early childhood)						
Late childhood	0.01		-0.26		0.07	
Adolescence	0.08		-0.08		0.21	
Male	0.45***		0.43		0.48***	
Maltreatment type						
Physical abuse	-0.12		-0.59		-0.02	
Neglect	-0.03		-0.32		0.04	
Maltreatment report count	0.02		-0.09		0.05	
Congregate care	0.07		0.51		-0.11	
Placement instability (Reference: One placement)						
Two placements	0.07		-0.15		0.16	
Three placements	0.00		-0.21		0.13	
Four + placements	0.22		-0.25		0.44*	
Linear regression on mediator						
Concentrated disadvantage	-0.63***		-0.66***		-0.63***	
Ethnic heterogeneity	-0.12***		-0.12***		-0.11***	
Residential stability	0.26***		0.22***		0.27***	
Black	-0.12***		-0.10**		-0.14***	
R Square						
Property offenses	0.07		0.16		0.09	
Collective efficacy	0.57		0.58		0.57	
Model fit						
RMSEA	0.02		0.00		0.02	
CFI	1.00		1.00		0.99	
TLI	0.99		1.03		0.98	
WRMR	0.77		0.39		0.77	

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

For the whole sample, only one variable is significantly associated with property offenses.

None of the neighborhood variables is significantly associated with property offenses. Male

foster youths are more likely to commit property offenses than female foster youths ($\beta = 0.45$, $p \leq 0.001$).

The regression on collective efficacy shows the same results as Table 12, which models overall delinquency with testing collective efficacy as the mediator. Three neighborhood sociodemographic factors and being African American were all significantly associated with the level of neighborhood collective efficacy.

The cross-sample comparison shows five differences, the first four of which highlight the unique findings from the subsample of 5+ years in care. First, for the subsample of 5+ years in care, neighborhood sociodemographic factor show indirect effects on property offenses. Concentrated disadvantage ($\beta = 0.11$, $p \leq 0.01$) and ethnic heterogeneity ($\beta = 0.02$, $p \leq 0.05$) are positively associated with property offenses. Residential stability is negatively associated with property offenses ($\beta = -0.04$, $p \leq 0.01$). Their indirect effects are mediated by collective efficacy. Second, for the subsample of 5+ years in care, collective efficacy is negatively associated with property offenses ($\beta = -0.17$, $p \leq 0.01$). Third, gender difference is not statistically significant for the subsample of 5+ years in care ($p = 0.144$). Fourth, the R^2 for property offenses is greater in the model for 5+ years in care than the other two samples (0.16 vs. 0.07/0.09). Fifth, the experience of four+ placements is positively associated with property offenses in the model for the subsample of no more than 5 years in care ($\beta = 0.44$, $p \leq 0.05$).

The results of testing neighborhood disorder as the mediator are displayed in Table 23. For the whole sample, the model fit indices show good model fit (RMSEA=0.02, CFI=1.00, TLI=0.99, WRMR=0.76). The variance explained in property offenses is 7% and neighborhood disorder is 68%, which indicate that the R^2 for property offenses is small, and for neighborhood disorder is large.

Table 23. Path analysis modeling property offenses with neighborhood disorder as mediator

Variables	Whole sample (N=2,360)		5+ years sample (N=767)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect	direct	indirect
Probit regression on property offenses						
African American	0.02	0.01	-0.31	0.00	0.12	0.00
Neighborhood sociodemographics						
Concentrated disadvantage	-0.09	0.05	-0.10	0.06	-0.07	0.03
Ethnic heterogeneity	0.01	0.01	0.01	0.01	0.01	0.01
Residential stability	-0.03	-0.01	-0.06	-0.01	-0.02	-0.01
Neighborhood mediator						
Neighborhood disorder	0.07		0.08		0.04	
Individual characteristics						
Age at first maltreatment (Reference: Early childhood)						
Late childhood	0.01		-0.25		0.07	
Adolescence	0.08		-2.75		0.21	
Male	0.45***		0.41		0.48***	
Race (Reference: White)						
Hispanic	-0.05		0.19		-0.13	
Maltreatment type						
Physical abuse	-0.12		-0.55		-0.02	
Neglect	-0.03		-0.31		0.03	
Maltreatment report count	0.02		-0.08		0.05	
Congregate care	0.07		0.48		-0.11	
Placement instability (Reference: One)						
Two placements	0.07		-0.14		0.16	
Three placements	0.00		-0.20		0.13	
Four + placements	0.22		-0.24		0.44*	
Linear regression on mediator						
Concentrated disadvantage	0.76***		0.74***		0.77***	
Ethnic heterogeneity	0.13***		0.10***		0.14***	
Residential stability	-0.19***		-0.19***		-0.19***	
Black	0.09***		0.05		0.11***	
R Square						
Property offenses	0.07		0.24		0.09	
Neighborhood disorder	0.68		0.68		0.68	
Model fit						
RMSEA	0.02		0.02		0.02	
CFI	1.00		1.00		1.00	
TLI	0.99		0.99		0.99	
WRMR	0.76		0.65		0.81	

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

For the whole sample, only one variable is significantly associated with property offenses. None of the neighborhood variables is significantly associated with property offenses. Male foster youths are more likely to commit property offenses than female foster youths ($\beta = 0.45$, $p \leq 0.001$).

The regression on neighborhood disorder shows the same results as Table 13, which models overall delinquency with testing neighborhood disorder as the mediator. Three neighborhood sociodemographic factors and being African American were all significantly associated with the level of neighborhood collective efficacy. Each standard deviation increase on concentrated disadvantage is associated with a 0.76 standard deviation increase on neighborhood disorder. Each standard deviation increase on ethnic heterogeneity is associated with a 0.13 standard deviation increase on neighborhood disorder. Each standard deviation increase on residential stability is associated with a 0.19 standard deviation decrease on neighborhood disorder. Being African American foster youths is associated with a 0.09 standard deviation higher on neighborhood disorder than foster youths of other races.

The cross-sample comparison shows three differences, the first two of which focus on the unique findings from the subsample of 5+ years in care. First, gender difference is not statistically significant for the subsample of 5+ years in care ($p = 0.14$). Fourth, the R^2 for property offenses is much greater in the model for 5+ years in care than the other two samples (0.24 vs. 0.07/0.09). Fifth, the experience of four+ placements is positively associated with property offenses in the model for the subsample of no more than 5 years in care ($\beta = 0.44$, $p \leq 0.05$).

The results of testing violent culture as the mediator are displayed in Table 24. For the whole sample, the model fit indices show good model fit (RMSEA=0.01, CFI=1.00, TLI=1.00,

WRMR=0.59). The variance explained in property offenses is 7% and violent culture is 55%, which indicate that the R^2 for property offenses is small, and for violent culture is large.

Table 24. Path analysis modeling property offenses with violent culture as mediator

Variables	Whole sample (N=2,360)		5+ years sample (N=767)		<=5 years sample (N=1,593)	
	direct	indirect	direct	indirect	direct	indirect
Probit regression on property offenses						
African American	0.04	0.00	-0.30	0.00	0.14	0.00
Neighborhood sociodemographics						
Concentrated disadvantage	-0.06	0.02	-0.06	0.01	-0.07	0.03
Ethnic heterogeneity	0.02	0.00	0.01	0.00	0.02	0.01
Residential stability	-0.04	0.00	-0.07	0.00	-0.02	0.00
Neighborhood mediator						
Violent culture	0.03		0.01		0.04	
Individual characteristics						
Age at first maltreatment (Reference: Early childhood)						
Late childhood	0.01		-0.25		0.07	
Adolescence	0.08		-2.75		0.21	
Male	0.45***		0.41		0.48***	
Race (Reference: White)						
Hispanic	-0.05		0.19		-0.12	
Maltreatment type						
Physical abuse	-0.12		-0.55		-0.02	
Neglect	-0.03		-0.31		0.03	
Maltreatment report count	0.02		-0.08		0.05	
Congregate care	0.07		0.48		-0.11	
Placement instability (Reference: One placement)						
Two placements	0.07		-0.14		0.16	
Three placements	0.00		-0.20		0.13	
Four + placements	0.22		-0.24		0.44*	
Linear regression on mediator						
Concentrated disadvantage	0.74***		0.68***		0.77***	
Ethnic heterogeneity	0.11***		0.08*		0.13***	
Residential stability	-0.07***		-0.12***		-0.06**	
Black	0.04		0.04		0.04	
R Square						
Property offenses	0.07		0.23		0.09	
Violent culture	0.55		0.53		0.56	

Table 24 (cont.)

Model fit			
RMSEA	0.01	0.00	0.02
CFI	1.00	1.00	0.99
TLI	1.00	1.04	0.98
WRMR	0.59	0.41	0.74

* $p \leq 0.05$., ** $p \leq 0.01$, *** $p \leq 0.001$

For the whole sample, only one variable is significantly associated with property offenses. None of the neighborhood variables is significantly associated with property offenses. Male foster youths are more likely to commit property offenses than female foster youths ($\beta = 0.45$, $p \leq 0.001$).

The regression on violent culture shows the same results as Table 14, which models overall delinquency with testing neighborhood disorder as the mediator. Three neighborhood sociodemographic factors were still significant. Being African American is not significantly associated with the level of neighborhood violent culture.

The cross sample comparison shows three differences, the first two of which focus on the unique findings from the subsample of 5+ years in care. First, gender difference is not statistically significant for the subsample of 5+ years in care ($p = 0.144$). Fourth, the R^2 for property offenses is much greater in the model for 5+ years in care than the other two samples (0.23 vs. 0.07/0.09). Fifth, the experience of four+ placements is positively associated with property offenses in the model for the subsample of no more than 5 years in care ($\beta = 0.44$, $p \leq 0.05$).

The summary of the results on neighborhood variables is displayed in Table 25. I only show the significant results. I list variables in rows by samples, and list dependent variables in columns by effect types. Some cells contain multiple numbers, since neighborhood sociodemographic factors were tested in multiple models, each of which is for different

mediators. The models may report different results on the same factor. As long as one of them is statistically significant, I list all of them. For example, in the part for whole sample, the cell at the cross of concentrated disadvantage and violent offenses direct contains three results. The first result “n.s.” indicates that concentrated disadvantage shows insignificant effect in the model testing collective efficacy as the mediator; the second result “0.17*” indicates that concentrated disadvantage shows significant and positive effect in the model testing neighborhood disorder as the mediator; the third result “0.16*” indicates that concentrated disadvantage shows significant and positive effect in the model testing violent culture as the mediator.

Table 25. Summary of results on neighborhood variables

	Overall delinquency		Drug offenses		Violent offenses		Property offenses	
	direct	indirect	direct	indirect	direct	indirect	direct	indirect
<i>Whole sample (n=2,360)</i>								
<i>Neighborhood sociodemographics</i>								
Concentrated disadvantage				0.11 *	n.s. 0.17 * 0.16 *	-0.11 *		
Ethnic heterogeneity				0.02 *	0.15 * 0.16 * 0.15 *	-0.02 *		
Residential stability				-0.03 *				
<i>Neighborhood social process</i>								
Collective efficacy								
Neighborhood disorder			0.14 *					
Violent culture					-0.14 *			
<i>5+ years sample (n=767)</i>								
<i>Neighborhood sociodemographics</i>								
Concentrated disadvantage				0.19 *				0.11 **
Ethnic heterogeneity				0.03 *				0.02 *
Residential stability				-0.05 *				-0.04 *
<i>Neighborhood social process</i>								
Collective efficacy							-0.17 **	
Neighborhood disorder			0.25 *					
Violent culture								
<i><=5 yrs sample (n=1,593)</i>								

Table 25 (cont.)

<i>Neighborhood sociodemographics</i>								
Concentrated disadvantage					n.s. n.s. 0.17 *			
Ethnic heterogeneity	0.13 * 0.13 * 0.13 *				0.18 * 0.19 * 0.19 *			
Residential stability								
<i>Neighborhood social process</i>								
Collective efficacy								
Neighborhood disorder								
Violent culture								

CHAPTER 5

DISCUSSION

Spatial Distribution of Placements

This study presents the spatial distribution of foster care placements in Chicago neighborhoods. The findings support the first hypothesis that foster youths were clustered in neighborhoods with high concentrated disadvantage, low collective efficacy, prevalent neighborhood disorder, and violent culture. Similarly, the t-test statistics on the comparison between placement related neighborhoods and all neighborhoods in Chicago indicate that the average quality of the neighborhoods associated with foster care placements is significantly below the average of Chicago neighborhoods. There is limited variance among the neighborhoods associated with foster care placements.

This is the first study that investigates spatial distribution of foster care placements. This dissertation was designed to answer the question about where the child welfare system places foster children in an urban environment. Previous child welfare studies focused on spatial distribution of maltreatment incidences (Drake & Pandey, 1996; Ernst, 2000; Kim, 2004; Freisthler et al., 2005). To my knowledge, none of the previous studies focused on the spatial distribution of foster care placements. The findings on spatial distribution of foster care placements help us measure the depth of child welfare intervention. Traditionally, the depth of child welfare intervention is measured from the dimension of service types. Each indicated allegation is followed by one or more of three types of interventions, including no service, in-home services and out-of-home placement. Out-of-home placement is generally considered the most intensive intervention among the three types. This study adds the spatial dimension to the measurement of child welfare services. Placing children within similar neighborhoods is a less intensive intervention than placing them in different neighborhoods. The current study offered

limited support on the neighborhood effects on delinquency. Future research can study its relationship with maltreatment recurrences, permanence, and other well-being outcomes such as education and health. The importance of measuring the spatial dimension depends on neighborhood effects on all of these outcomes.

The overlap between the clusters of placement related neighborhoods and the clusters of disadvantaged neighborhoods might be due to the fact that many foster children were placed close to their original neighborhoods. Child welfare policy requires that agencies take neighborhoods into consideration in making placement decisions. According to the Adoption Assistance and Child Welfare Act of 1980 (U.S. Public Law 96-272), agencies should find “the least restrictive (most family-like setting) and most appropriate setting available and in close proximity to the parents’ home, consistent with the best interest and special needs of the child”. In practice, placing children in their neighborhoods of origin became a placement priority. This is especially true for kinship foster care. Around the time when the study sample was in care, between 1986 and 1994, kinship foster care increased almost 500% in Illinois (Testa, 2001). In Chicago, “grandmother cases” in African American families were incorporated into the formal foster care system. Many cases in relative foster care were non-removals. Among all foster care placements, 45% of first placements were within five miles of the children’s parents’ addresses. Many foster youths were from families in disadvantaged neighborhoods. Numerous studies report that disadvantaged neighborhoods have higher rates of child maltreatment, especially neglect (Drake & Pandey, 1996; Kim, 2004; Freisthler et al., 2004). Therefore, placing foster youths in their original neighborhoods is likely to keep them in the disadvantaged neighborhoods.

Staying in disadvantaged neighborhoods adds to the cumulative negative experiences of foster youths. Not only do foster youths experience maltreatment and get placed out of home,

they typically remain or are placed in disadvantaged neighborhoods. The cumulative negative experiences might increase the risk of delinquency among foster youths. The delinquency petition rate of foster youths in this study is over three times the rate of the general population (11.19% vs. 3.48%).

Neighborhood Effects

The findings indicate that neighborhood sociodemographics are associated with neighborhood social process, including collective efficacy, neighborhood disorder, and violent culture. Neighborhood sociodemographic variables were summarized in three factors, concentrated disadvantage, ethnic heterogeneity, and residential stability. All three factors were associated with each mediator. Regarding collective efficacy, neighborhoods concentrated disadvantage and ethnic heterogeneity are negatively associated with collective efficacy, while residential stability is positively associated with collective efficacy. Regarding neighborhood disorder, neighborhoods concentrated disadvantage and ethnic heterogeneity are positively associated with neighborhood disorder, while residential stability is negatively associated with neighborhood disorder. Regarding violent culture, neighborhoods concentrated disadvantage and ethnic heterogeneity are positively associated with violent culture, while residential stability is negatively associated with violent culture. The directions of these relationships are all consistent with previous literature (Sampson, 1997; Sampson et al., 1997).

The findings indicate that neighborhood sociodemographic factors have direct impacts on violent offenses (Table 18, 20, & 21). Foster youths associated with neighborhoods characterized by higher levels of concentrated disadvantage and ethnic heterogeneity are more likely to commit violent offenses. Residential stability is not directly associated with violent offenses. Previous literature also reported similar impacts of concentrated disadvantage

(Peterson et al., 2000; Sampson 1997; Morenoff, Sampson, & Raudenbush, 2001) and ethnic heterogeneity (Sampson & Grove, 1989) on violent offenses with control of neighborhood social process variables.

The relationship between concentrated disadvantage and ethnic heterogeneity and violent offenses may be explained by gang concentration in the neighborhoods characterized by high concentrated disadvantage and ethnic heterogeneity. As one type of violent offenses, gang violence is prevalent in Chicago. Four major gangs, Black Gangster Disciples Nation (BGDN), Latin Disciples, Latin Kings, and Vice Lords, cluster in South and West sides of Chicago (Block & Block, 1993). The South side is characterized by a high level of concentrated disadvantage. The West side is characterized by an ethnically mixed composition.

The finding that residential stability is not significantly associated with violent offenses may be tied to the trend of population changes in Chicago. Chicago has experienced dramatic population change since 1960s. White families as well as middle classes African American families moved out of the city. Residential stability measures the percentage of living in the same house as five years ago and percent of homeownership. Unlike other places, the percentage of living in the same house as five years ago in Chicago may not necessarily indicate that families are financially stable to stay. Instead, families may have to stay in the same house because they do not have the resources to move out of the city. The protective effect of residential stability may be overshadowed by the deleterious effect of concentrated disadvantage, which might explain the finding that residential stability is not statistically significant in any model.

Another significant direct effect is that for the subsample of no more than five years in care, ethnic heterogeneity is positively associated with general delinquency, while the

relationship is not statistically significant for the whole sample or the subsample in care over five years. This finding is contradictory to the hypothesis that neighborhood effects are more likely to be significant for the subsample in care for longer time. This might be because foster youths who were in care for no more than five years had limited time for assimilation, which can be more challenging when they were placed in the neighborhoods with higher percentages of residents of different races. When foster youth do not assimilate well, they might be more likely to act out.

The findings indicate that neighborhood sociodemographic factors have indirect effects on drug offenses mediated by neighborhood disorder (Table 16), and have indirect effects on property offenses mediated by collective efficacy (Table 22). Concentrated disadvantage and ethnic heterogeneity are positively associated with drug offenses, while residential stability is negatively associated with drug offenses. These relationships are completely mediated by neighborhood disorder. In other words, foster youths in the neighborhoods of higher concentrated disadvantage, higher ethnic heterogeneity, and lower residential stability are more likely to commit drug offenses, since their neighborhoods have higher levels of neighborhood disorder. The finding supports the “Broken window” theory (Wilson & Kelling, 1982), which suggests that physical signs of disorder, such as broken windows, indicate the unwillingness of residents to intervene in a crime. Therefore, potential offenders feel more freedom to commit offenses in these neighborhoods. However, it should be noted that there is an overlap between the measurement of neighborhood disorder and drug offenses. Among the five questions on neighborhood disorder, one asks respondents how much “people selling or using drugs” is a problem in their neighborhoods. Therefore, the positive relationship between neighborhood disorder and drug offenses may actually indicate that they are measuring the same construct. In

a review of neighborhood studies, Sampson, Morenoff, and Gannon-Rowley (2002) also found that it is undecided as to whether neighborhood disorder is an explanatory mechanism or an outcome.

Concentrated disadvantage and ethnic heterogeneity are positively associated with property offenses, while residential stability is negatively associated with property offenses. These relationships are completely mediated by collective efficacy. In other words, foster youths in the neighborhoods of higher concentrated disadvantage, higher ethnic heterogeneity, and lower residential stability are more likely to commit property offenses, since their neighborhoods have lower levels of collective efficacy. Previous literature also reported that collective efficacy is associated with reduced delinquency and problem behaviors among adolescents (Bellair, 2000; Ellitt et al., 1996; Sampson, 1997). Most of these studies used a single indicator of delinquency that captures all types of delinquent or behavior problems together (Ellitt et al., 1996; Sampson, 1997). Bellair (2000) studied assault and burglary separately, and showed that collective efficacy is associated with reduced risks of both types of offenses.

The findings supported the hypothesis that the length of stay in care moderates neighborhood effects on delinquency among foster youths. More neighborhood effects are statistically significant for foster youths with over five years in care. The indirect neighborhood effect on property offenses is only found for the subsample of foster youths with over five years in care. The indirect neighborhood effect on drug offenses is found for the whole sample and the subsample of foster youths over five years in care, but not for the subsample of foster youths no more than five years in care. The only exception is that ethnic heterogeneity is positively associated with general delinquency for the subsample of no more than five years in care. It is unclear why this relationship is only found for foster youths with shorter lengths of time in care.

Individual Characteristics

Hispanic This study shows that among foster youths in care no more than five years, Hispanic foster youth are less likely to commit drug offenses than Caucasian foster youths (Table 15, 16, & 17). Drug offenses capture both drug use and drug sale related offenses. This finding is consistent with previous literature. Hagan and Palloni (1999) studied the 1991 survey of state prison inmates, and reported that drug uses among Hispanic offenders are similar or lower than the broader population of inmates. Other empirical studies also consistently reported that Hispanics have lower rates of substance use than Caucasians (Fishbein & Perez, 2000; SAMHSA, 1998; Vacarro & Wills, 1998; Wells et al., 1992).

This study does not show that Hispanic foster youth differ from Caucasian foster youths on other types of offenses. Previous studies (Sampson et al., 2005) reported that the odds of violent offenses for Hispanics is 10% lower than for Caucasian. The difference was no longer statistically significant as the authors added the mediators, including having married parents, living in a neighborhood with a high concentration of immigrants, and being first generation immigrants. The current study also controlled for neighborhood variables, but did not control for parents' marital status and immigrant generation status.

African American Bivariate analysis showed that African Americans have significantly higher delinquency rates than Caucasians. However, the result of the multivariate analysis did not confirm the difference. Multivariate analysis controlled for individual demographics, maltreatment experiences, placement experiences, as well as neighborhood variables. This finding is different from an earlier study using the same dataset. Ryan and Testa (2005) showed that African Americans are associated with higher risk of delinquency as compared with Caucasians in their multivariate analysis. The different findings between the two studies might

be due to different control variables. The current study added neighborhood variables into analysis. I tested the hypothesis that the effects of being African American are mediated through neighborhood social process. This hypothesis is based on Sampson and Wilson's theory (2005) that African American's overrepresentation in violent crime is due to their exposure to structural barriers and social disorganization at the community level.

Previous child welfare studies (Jonson-Reid, 2002; Ryan et al., 2008; Ryan et al., 2010) proposed theoretical speculations that neighborhood differences between residences of different racial groups might explain differences in delinquency rates. To my knowledge, this is the first child welfare study that uses empirical data to examine whether neighborhoods explains racial differences on delinquency. This study partially supports the hypothesis that neighborhood social process mediates the relationship between race and delinquency. Among foster youths who stayed in care over 5 years, being African American is associated with higher risks of property offenses than being other races, which is mediated by collective efficacy (Table 22). In other words, being African American is associated with higher risks of being placed in the neighborhoods of lower collective efficacy, which is associated with higher risk of committing property offenses.

Previous studies on the general population also showed that neighborhood variables explained racial differences on delinquency. However, they identified different neighborhood variables as mediators. Sampson and colleagues (2005) reported that the odds of perpetrating violence for African Americans is 85% higher than for Caucasians, and over 60% of the difference was explained by neighborhood social context, as well as parents' marital status and immigrant generation. The mediators included percent of first generation immigrants (negatively associated with perpetrating violence), percent of professional/managenial occupations

(negatively associated with perpetrating violence), and level of moral/legal cynicism (called “violent culture” in this study) (positively associated with perpetrating violence). Similarly, studies using national data (McNulty & Bellair, 2003) and the Pittsburgh youth study (Peeples & Loeber, 1994) also reported that neighborhood disadvantage accounted for the higher rates of violent offenses among African Americans as compared with Caucasians.

In addition, the sample is primarily comprised of African American foster youths. African Americans make up for 89.58% of the whole sample, 95.05% of the subsample of over five years in care, and 86.94% of the subsample of no more than five years in care. There are limited numbers of Caucasian and Hispanic foster youths in the sample. The big gaps in the sizes of each racial group compromises the power to examine race differences.

Gender The current study shows that male foster youths are more likely to commit offenses than female foster youths among most types of offenses. The only exception is property offenses. Among foster youths in care for over five years, gender is not significantly associated with property offenses. Previous literature also found gender differences exist for personal crime (i.e. violent crimes), but not for property crimes (Friedman & Rosenbaum, 1988), with control of other individual, family, and school characteristics. It is unclear why the absence of gender difference on property crimes only occurs for foster youths in care for over five years. It is worth researching to identify which experiences for the long stayers explain the absence of gender differences. A similar trend shows in the models for offenses in general and other offense types, in which gender differences for the subsample of over five years in care are statistically significant, but smaller than the subsample of no more than five years in care.

Congregate Care This study reports that congregated care experiences are associated with increased risks of violent offenses. This finding is consistent with previous literature (Huang,

Ryan, Herz, 2012; Ryan, Marshall, Herz, & Hernandaz, 2008). Ryan and colleagues (2008) showed that foster youths in group home are more likely to commit violent offenses as compared with foster youths in other placements (29% vs. 18%). Studying dually-involved youths in LA County, Huang and colleagues (2012) showed the distribution of the most serious offense types for foster youths in various placement types. The authors reported that youths in group homes were involved in higher percentage of violent offenses than foster youths in other placements. Nearly half (45%) of the charges for youths in group home were for violent offenses.

Three reasons might explain the increased risk of violent offenses for youths who live in group home. First, foster youths in congregate care are likely to be exposed to peer contagion. Congregate care usually houses youths from both child welfare and other public service systems, such as the juvenile justice system. Some youths developed deviant behaviors before entering congregate care. Other youths socialize with deviant peers and learn problem behaviors (Dishion, McCord, Poulin, 1999). Second, congregate care provides the environment for more intensive peer interaction. Youths in congregate care usually have to share space with a group of peers. For example, in the transitional living program of a local child welfare agency, around 5-10 youths of the same gender are placed in the same house (author's observation during MSW internship). They share living rooms, bathrooms, kitchens, board games, and furniture like TV sets. Disagreement on the usage of public spaces and resources is frequently a source of conflicts. Youths also get into fights because their peers cause noise in the house. The intensive peer interaction, and more importantly, the need to share space and resources increase the likelihood of peer conflicts, some of which become physical and escalate into violent offenses. Third, congregate care has a more sensitive reporting policy on violent behaviors. Staff members in congregate care are likely to report to law enforcement agencies about deviant behaviors (Herz,

Lee, Lutz, Stewart, Tuell, & Wiig, 2012), which may be handled informally in family setting placements.

Placement Instability Placement instability is associated with higher risks of general delinquency for the whole sample and the subsample of no more than five years in care (Table 12, 13, & 14). As for the specific offense type, placement instability is associated with higher risks of property offenses for the subsample of no more than five years in care (Table 22, 23, & 24). Placement instability is more deleterious for the subsample of shorter lengths of time in care, since high placement instability during shorter lengths of time means more frequent placement changes.

CHAPTER 6

LIMITATIONS

First, this study does not differentiate the cases who returned home. Some cases in the sample returned home following placement. They are exposed to neighborhood effects of both placement neighborhoods and home neighborhoods. The cases who returned home early can be living in their home neighborhoods for a long period of time, and can be especially influenced by home neighborhoods. Future research should include home environment, and examine the impacts of placement neighborhoods and home neighborhoods respectively with the consideration of time spent in each neighborhood. Studying neighborhood effects of home neighborhoods can inform biological parents about how to prevent their children from becoming involved in delinquency.

Second, the unusual racial composition of the sample limits the external validity of this study. This study uses a sample predominated by African Americans, which might be unique to Chicago. In the study sample, 89.58% were African American, 3.22% were White, and 7.20% were Hispanic. The racial composition of the study is different from most geographic areas in the US. The percentage of African Americans in this sample is greater than their percentage in the State of Illinois. For example, among the children who entered substitute care in Illinois in 1994 (Children and Family Research Center, 1999), 70.77% (n=8,833) were African American, 5.08% (n=634) were Hispanic, and 24.15% (n=3,014) were Caucasian. The percentage of African Americans in this sample is also greater than their percentage among foster children in other states. For examples, among foster children in California (Berrick, Needell, Barth, & Jonson-Reid, 1998), 37% were African American, 36% were Caucasian, 25% were Hispanic, and 2% were other. The findings on neighborhood effects from this study might only be

applicable to the areas that are predominately African American, while might not be generalizable to the areas of different racial compositions.

Third, this study uses neighborhood data that were collected nearly 20 years ago, which raises concerns about the generalizability of this study to current research and practice. However, neighborhood conditions usually do not change rapidly. Sampson (2008) showed that the neighborhoods remain stable regarding poverty, crime, collective efficacy, and trust. For example, even though the crime rate decreased in the 1990s, the ranking of crime rates among neighborhoods remained similar. Therefore, the findings of this study may still be applicable to current research and practice.

Fourth, this study dichotomizes the measures of dependent variables on offense type. The dependent variables indicate whether one individual was charged with one type of offense. I coded “0” for all the individuals who did not commit the specific type of offense. I decided not to differentiate the ones without any offense and the ones with only other offenses. The decision was based on two considerations. First, there were a small number of cases with only other offenses. Second, I intended to model one individual’s tendency to commit one specific type of offense. To better differentiate the two groups within the ones coded “0”, future research should use multinomial analysis.

Fifth, this study does not examine congregate care as the mediator. Living in disadvantaged neighborhoods can jeopardize foster youths’ adjustment in foster care placements, especially when foster youths learned to behave defiantly through socializing with deviant peers. Deviant behavior and poor adjustment in foster care placements can increase the likelihood of moving into congregate care placement. This study shows that congregate care placement is associated with the increased risk of violent offenses. Congregate care might mediate the

relationship between neighborhood and delinquency. Not including the relationship between neighborhood and congregate care can limit whether neighborhood effects show up in the model.

Sixth, I did not examine the moderation effect of gender through either separate sample analysis or interaction. Previous research shows that males and females respond differently to neighborhood change (Kling, Ludwig, & Katz, 2005). For example, in the MTO project, an experimental project in which the experimental group families moved to low-poverty neighborhoods, female youths in the experimental group reported fewer offenses than female youths in the control group. However, male youths show mixed results. Male youths in the experimental group reported fewer violent offenses than male youths in the control group, but more property offenses. The qualitative research on the MTO sample showed that gender differences on behavior outcomes are due to their differences on assimilation into new neighborhoods and schools (Clampet-Lundquist, Edin, Kling, & Duncan, 2011). In general, female youths assimilated better and faster. I did not test the moderation effect, since I already split the sample by lengths in care. Future research can utilize interaction terms for this purpose.

Seventh, this study does not control for confounding variables related to caregivers and peers. Criminal history and parenting behaviors of caregivers and behaviors of peer groups have great impacts on children's behavior (Chung & Steinberg, 2006; Rankin & Quane, 2002). A study using national inmate surveys in 1986 and 1991 (Johnson & Waldfogel, 2002) estimated that at least 7% of foster children have incarcerated parents. Studies also showed that children of criminal parents are more likely to commit crimes (Lattimore, Visher, & Linster, 1995). Positive parenting can buffer the impact of disadvantaged neighborhoods (Gorman-Smith et al., 2000). More structured parenting and more time spent with children protect children from becoming involved in delinquency. Mental illness and substance abuse of caregivers can also compromise

children's positive development. Peers also have great impacts on adolescents (De Coster et al., 2006; Rankin & Quane, 2002). Foster youths who experienced maltreatment are more likely to have difficulty regulating their emotions and behaviors, which become barriers for them in their socialization with conventional peers (Bender, 2010). Therefore, they are more likely to socialize with delinquent peers. However, I do not have measures of the characteristics of biological parents and foster care providers and peers. Future research should consider adding the data on caregivers and peers, such as merging data from criminal justice and education systems.

CHAPTER 7

IMPLICATIONS

Research Implications

First, future study could study the effects of the surrounding neighborhoods on delinquency among foster youths. Previous studies on the general population show the spillover effects of surrounding neighborhoods (Grunwald et al., 2010; Mennis & Harris, 2011; Mennis et al., 2011). The current study indicates the statistically significant spatial clustering of neighborhood census variables and percentage of foster youths. Future research should start by studying spatial clustering of delinquency among foster youth. If spatial clustering is statistically significant, researchers should follow up with spatial cross-regressive modeling to model spatial autocorrelation between nearby areas. Spatial cross-regressive models include a spatial lagged measure of the independent variables. As an example, Crowder and South (2008) used spatial cross-regressive modeling to study the effects of local and extralocal racial conditions on neighborhood out-migration. Researchers can use the distance-decay strategy to define the spatial weight matrix as $w_{ij} = 1/d_{ij}$ where d_{ij} indicates the distance between the centroid of tract i and the centroid of tract j . Several scholars (Anselin, 2002; Downey 2006) reported the advantages of the distance-decay strategy over the simpler adjacency approach.

Second, future study should study whether service type moderates neighborhood effects. It is particularly important to study the moderation effects of kinship care. Staying in kinship care is likely to be associated with staying in the disadvantaged neighborhoods, which are close to parents' homes. However, kinship care has many advantages (Geen, 2004). Children in kinship care usually live with known relatives, stay in their original neighborhoods, are placed with siblings, and maintain frequent contact with parents. These advantages of kinship care

reduce emotional trauma, which can help to prevent delinquency. Future research should examine whether kinship care reduces the deleterious effects of neighborhood concentrated disadvantage and ethnic heterogeneity.

Third, future study should include more diverse neighborhoods. In this study, foster youths in the sample live in homogenous neighborhoods. They were all placed in the City of Chicago. The neighborhoods associated with their placements clustered in disadvantaged neighborhoods in the South and West side of Chicago. The values of neighborhood sociodemographics and social processes have limited variance, which limited the power of this study. Future research should select samples from more diverse neighborhoods. For example, future research can include foster children placed in suburban Cook County. Given that there is no existing data on neighborhood social process data for suburban areas, future research can start by examining the impacts of neighborhood sociodemographics, which can be extracted from census data. Another direction to go is to use national dataset that sampled child welfare population from diverse neighborhoods, such as NSCAW. NSCAW data also has the advantage of including children and youths in a variety of service programs, including investigation only, in-home services, and out-of-home placement. Besides, NSCAW contains rich variables collected from multiple stakeholders with a variety of measures. Grogan-Kaylor and colleagues (2008) used NSCAW data to study risk and protective factors of behavior problems. The authors did not find significant neighborhood effects.

Fourth, future study should consider using more advanced models to control selection bias in studying neighborhood effects. Including more diverse neighborhoods, researchers can also consider using Propensity Score Matching (PSM) to compare delinquency outcomes between similar foster children placed in different neighborhoods. Directly modeling the

assignment, PSM reduces multidimensional covariates to a propensity score, and can yield unbiased causal effect estimates (Guo & Fraser, 2010). Matching should be based on individual characteristics as well as caregiver and peers related variables. Future research should consider merging the data on caregivers and peers, such as administrative data from criminal justice and education systems.

Practice Implications

First, understanding the effects of neighborhoods offers a new perspective to view neighborhood based foster care. Child welfare agencies currently consider placing children in their neighborhoods of origin as a priority. It is believed that placing children in their neighborhoods of origin may minimize academic disruptions, encourage cultural continuity, and encourage parents' visits to their children in placement, which increase the likelihood of reunification (Berrick, 2006). However, the neighborhoods of origin for maltreated children usually have some disadvantages. This study partly supports the hypothesis that neighborhood disadvantages increase the risk of delinquency among foster youths. The findings suggest that the child welfare system should be mindful of neighborhood effects on child well-being in the long run. The deleterious effects of disadvantaged neighborhoods may outweigh the benefits of staying close to social ties. Strong social ties between residents may not always guarantee collective efficacy. Some neighborhoods with strong social ties show low collective efficacy. Relatives do not intervene when seeing disorder. This is particularly true in disadvantaged neighborhoods (Sabol, Coulton, & Korbin, 2004). Without collective efficacy, those neighborhoods report higher crime rates similar to the ones with low social ties and collective efficacy. Using PHDCN data, Morenoff and colleagues (2001) showed that hot spots of homicide are distributed nearly equally between the neighborhoods with low ties and low

efficacy (40 out of 103), and the neighborhoods with high ties but low efficacy (38 out of 103). Another study (Sampson et al., 2005) showed that adult extended kin living in the household did not have significant effects on violent behavior among adolescents.

Caseworkers should choose to place foster children in less disadvantaged neighborhoods, when they choose from foster care placements that are similar in all aspects except for neighborhood conditions. Moreover, caseworkers should learn from the MTO program that relocates the families who receive public housing to low-poverty neighborhoods. The evaluation of the MTO project reported that female youths in the experimental group report fewer offenses than female youths in the control group, while male youths show mixed results (Kling, Ludwig, & Katz, 2005). The qualitative research on the MTO sample indicated that female youths assimilated into new neighborhoods and schools better than male youths, which contributes to their differences on delinquency outcomes (Clampet-Lundquist et al., 2011). Therefore, caseworkers should help foster children assimilate into new neighborhoods. This is particularly important for male foster children.

Second, understanding the mediators through which neighborhood demographics impact the risk of delinquency can inform delinquency prevention programs. This study shows that collective efficacy and neighborhood disorder mediate the relationship between neighborhood sociodemographic factors and delinquency. The finding suggests that social service agencies should enhance collective efficacy and control neighborhood disorder in disadvantaged neighborhoods. To do that, child welfare agency should collaborate with other social service agencies such as community services agencies, which is consistent with the current trend towards service integration (Bowden, Lutz, & Herz, 2010; Mattingly, 2010). Social service agencies can use community justice and community policing.

Community justice can be used to enhance collective efficacy. Unlike formal sanctioning institutions, community justice is an informal sanctioning response to youth delinquency (Bazemore, 2000). In practice, offenders meet with their victims and community members in neighborhood settings in informal decision-making and dialogue sessions (Bazemore, 2001). Offenders are expected to learn about the effect of their offense on others and reach a contract how they can make amends to victims and the community. Victims are also engaged in the process. They discuss how their lives are impacted by delinquency, learn about the offender's motivation, and give input into informal sanction. Since community justice focuses on repairing harm, it is also called restorative justice. Bazemore (2000 & 2001) suggested that community justice involves volunteers in conflict resolution and problem solving, which build their confidence in intervening on behalf of the common good, which is the essence of collective efficacy. Ohmer and colleagues (2010) developed a training program to facilitate residents with interventions pertaining to neighborhood problems in Atlanta, Georgia. Their training incorporated the principles from community justice, peacemaking criminology, and macro social work. The authors reported that participants increased their intervention in neighborhood problems and were more likely to use direct, non-violent and peaceful intervention strategies. Regarding its effects on delinquency, a meta-analysis (Latimer, Dowden, Muise, 2005) of restorative justice literature over 25 years (Year 1980 through Year 2005) indicated that restorative justice is associated less recidivism as compared with traditional sanctions.

Community policing can be used to address neighborhood disorder. Community policing is different from traditional policing, which serves to stop ongoing crimes, investigate and arrest criminals, and initiate processing. Community policing emphasizes proactive policing and crime prevention. Community policing aims to identify the social conditions that generate crime and

change them, which helps reduce crime and therefore, protect the quality of life of citizens (Xu, Fiedler, & Flaming, 2005). Community policing considers neighborhood disorder as a major and immediate condition that generates crime, and therefore, aims to reduce neighborhood disorder. Xu and colleagues (2005) studied the effectiveness of community policing. The authors used working with community and crime prevention as the indicators of community policing, and reported that community policing is associated with reduced neighborhood disorder, which led to reduced crime. Another benefit is that community policing is a collaboration effort between police and communities, which helps to connect segregated and disadvantaged neighborhoods with outside resources.

Third, neighborhood programs should remain in operation for a long time. This study shows that more neighborhood effects are statistically significant for foster youth in care for over five years than for those in care for no more than five years. The finding indicates that it takes a long time for neighborhood effects to impact individual's behaviors. Therefore, social programs targeting neighborhood should remain in operation for a long time. Previous literature also suggested that neighborhood effects take time to operate (Clampet-Lundquist & Massey, 2008, p. 128). Neighborhood programs may not address social problem quickly, while they may show positive outcomes in the long term. In addition to the time that it takes for neighborhood changes to impact individuals' behaviors, it also takes time for neighborhood programs to change the neighborhoods.

Funding long-term neighborhood program can be supported by community development that enhances local economic development. Neighborhood crime prevention programs work best in combination of community development (Sabol et al., 2004). Community development relies on the support from higher levels of power outside the community. For example, empowerment

zones refer to the tax policies through which businesses receive tax incentives for locating in economically depressed neighborhoods. Similar types of support on community development include Job Corps and School-to-work transition programs. These programs increase local employment opportunities and economic development.

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APPENDIX A

MEASURES OF NEIGHBORHOOD SOCIAL PROCESS IN PHDCN

<u>Collective Efficacy</u>	
<u>Informal Social Control</u>	
“Neighbors would do something if ...”	1 - 5, strongly disagree - strongly agree
1. Children were skipping school and hanging out on a street corner.	
2. Children were spray-painting graffiti on a local building.	
3. A child was showing disrespect to an adult.	
4. A fight started in front of their house.	
5. The fire station closest to their home was threatened with budget cuts.	
<u>Social Cohesion</u>	1 - 5, strongly disagree - strongly agree
1. People around here are willing to help their neighbors.	
2. This is a close-knit neighborhood.	
3. People in this neighborhood can be trusted.	
4. * People in this neighborhood generally do not get along with each other.	
5. * People in this neighborhood do not share the same values.	
<u>Neighborhood Disorder</u>	1 - 5, strongly disagree – strongly agree
1. Litter, broken glass or trash on the sidewalks and streets.	
2. Graffiti on buildings and walls.	
3. Vacant or deserted houses.	
4. Drinking in public.	
5. People selling or using drugs.	
6. Groups of teenagers or adults hanging out in the neighborhood and causing trouble.	
<u>Violent Culture</u>	1 - 5, strongly disagree – strongly agree
7. Laws were made to be broken.	
8. It is okay to do anything you want as long as you do not hurt anyone.	
9. To make money, there are no right or wrong ways anymore, only easy ways and hard ways.	
10. Fighting between friends or within families is nobody else’s business.	
11. Nowadays a person has to live pretty much for today and let tomorrow take care of itself.	

* indicates reversely coded items.

APPENDIX B

FIRST ORDER QUEEN CONTIGUITY

As shown in the following figure, all the other regions are considered neighboring regions of region *a*.

Figure 19. First order queen contiguity

(f)	(b)	(g)
(d)	(a)	(e)
(h)	(c)	(i)