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Washington University in St. Louis

The Brown School

Social Work

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Poverty, Child Maltreatment and Adverse Childhood Experiences – Just Comorbidities?

By

Darejan Dvalishvili

A dissertation presented to the Brown School of Washington University in St. Louis in
partial fulfillment of the requirements for the degree of Doctor of Philosophy

December 2022

St. Louis, Missouri

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Dedication

To My Family: Roman, Tamar, Irakli, and Levan who have been always there for me,
and
to My Grandfather Gugula who taught me to dream big

Acknowledgments

First of all, I would like to express my sincere gratitude to my professor, mentor, and chair of my committee, Dr. Melissa Jonson-Reid. I wouldn't be able to complete my dissertation project and my entire doctorate journey without her invaluable patience, and consistent support both professionally and personally.

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Abstract

Poverty, Child Maltreatment and Adverse Childhood Experiences – Just Comorbidities?

By

Darejan Dvalishvili

Doctor of Philosophy in Social Work

The Brown School, Washington University in St. Louis, Year

Professor Melissa Jonson-Reid, Chair

Both child abuse and neglect (hereafter maltreatment) and poverty are serious social and public health problems that are related to numerous negative and costly outcomes as well as being related to other so-called adverse childhood experiences (ACES). A significant, yet recent, body of work suggests a strong, perhaps causal, relationship between poverty and maltreatment. Much remains unknown about how they are associated and whether or not a true causal relationship exists while controlling for other potential risks in the ecology. This dissertation conducted a secondary analysis of the Panel Study of Income Dynamics (PSID) to help address this gap. First the prospective relationship between poverty over time and a proxy measure for maltreatment was explored. Next retrospective recall of maltreatment and others ACEs in adulthood were explored to see how they were associated with childhood history and if child maltreatment had a distinct set of predictors from other ACES.

Findings suggest that both family level and neighborhood level poverty are associated with caregiver report of harsh and neglectful parenting while controlling for demographics, family conflict and other neighborhood factors. Later adult self-report of ACEs was common (nearly 80% reported at least one). Certain measures of poverty increased the likelihood of

reporting of ACES, while there was an indication that receipt of poverty services at birth decreased that likelihood. Further exploration of adult recall of ACES, however, suggested that the co-occurrence of various ACES was difficult to disentangle. In other words, there were few differences by type of ACE, though a latent class analysis suggested it was possible to discriminate between those who reported more as compared to fewer ACES but not between types. While there are a number of limitations to the measures and data, findings suggest that addressing income needs at an early age may have preventive impacts in both caregiver-reported behaviors that suggest maltreatment as well as later retrospective recall of maltreatment and other ACEs. The fact that it was difficult to differentiate between types of ACEs suggests that anti-poverty efforts may also impact the likelihood of other ACEs though more research is required to establish the range of benefits.

Epigraph

“All grown-ups were once children... but only few of them remember it.”

Le Petit Prince by Antoine de Saint-Exupéry

Chapter 1: Introduction

The data are clear that both child poverty and Adverse Childhood Experiences (ACEs), including child maltreatment, are significant public health concerns due to their high prevalence and associated adverse short- and long-term outcomes in later life (Bellis et al., 2019; Chokshi, 2018). Both result in significant costs for society. A recent meta-analysis estimated that total annual costs attributable to ACEs were about \$748 billion in North America (US, Canada) alone (equivalent to 3.55% of GDP) (Bellis et al., 2019). Specifically, based on 2015 substantiated incident cases of child maltreatment alone (482,000 nonfatal and 1,670 fatal victims), the estimated economic burden on the U.S. population was \$428 billion, translating into lifetime costs of \$2 trillion (Peterson et al., 2018). Child poverty costs (monetary value of the reduction in adult productivity, increased costs of crime, health expenditures associated with children growing up in poor families, and increased costs as a result of child homelessness and maltreatment) range from 4.0 %- 5.4 % of annual Gross Domestic Product (GDP) – roughly between \$800 billion and \$1.1 trillion annually if measured in terms of the size of the U.S. economy in 2018 (NASEM et al., 2019).

Child maltreatment occurs in all social classes, and although most parents living in poverty do not abuse their children, children of low-income and poor families are highly over-represented among the children reported to CPS services for child abuse and neglect (Berger, 2004; Drake & Pandey, 1996; Hussey & Guo, 2005; Pelton, 2015; Sedlak et al., 2010). The numerous studies found this relationship with differing forms of data (Pelton, 2015) and that it is not limited to studies using official reports or surveys of mandated reporters (Pelton, 2015; Sedlak et al., 2010). The National Incidence Study-IV surveyed mandated reporters and case characteristics of reported and suspected cases and found that children in low socioeconomic

status households experienced abuse at more than three times the rate of other children, with neglect being about seven times more common among poor children (Sedlak et al., 2010).

Other ACEs also occur across all social classes. However, low socioeconomic status in childhood also increases the risks of experiencing ACEs beyond maltreatment alone (NASEM, (NASEM et al., 2019; Walsh et al., 2019). The National Survey of Child Health showed that on average, the poorest children experience twice as many ACEs as do children in the highest income stratum (Slopen et al., 2013). Like the outcomes associated with child maltreatment, ACEs are not only more prevalent among the poor, but they are also associated with deleterious effects of poverty (Mersky et al., 2017).

The primary focus of the present dissertation is to better understand the links between child maltreatment and poverty, however. the overlap in forms of maltreatment and other adverse childhood experiences makes it difficult to isolate the experience of abuse or neglect. Further, while emerging evidence indicates that poverty can be considered as a causal factor for child maltreatment as well as other ACEs, far less is known about the extent to which poverty reduction policies and family support services might mitigate this relationship (Jones et al., 2006; Walsh et al., 2019). Of the various ACEs included in studies, maltreatment has perhaps received the most attention related to poverty. While the association between poverty and maltreatment is generally well-accepted (Pelton, 2015), little research is available to attempt to explain a causal path or even estimate the effect size for the relationship between poverty and maltreatment, mostly due to design and measurement inconsistencies (Slack et al., 2017). The influence and strength of the relationship between poverty and child maltreatment are particularly interesting to consider in the context of policies and interventions aiming to reduce poverty (Esposito et al.,

2017) (Esposito et al, 2017). This relationship is also strongly tied to the field of social work, which, nationally and internationally, is still at the forefront of child protection practices and policies.

Scope and Definitions of Poverty, ACEs, and Child Maltreatment

Child poverty, maltreatment, and the broader group of ACEs are complex constructs. Broadly defined, child poverty is measured by the number of children living in families/households with incomes below the federal poverty line (NASEM et al., 2019). Even though poverty is conceptualized and measured in various ways, the data indicate that it is a phenomenon that is distributed unevenly by race, age, gender, or educational status (Matters, 2020) (Matters, 2020). Also, no matter how it is measured (Official Poverty Measure (OPM) vs. Supplemental Poverty Measure (SPM)), poverty is associated with the same demographic patterns in terms of age, gender, race, family structure, educational attainment, working experience, and disability status (Fox, 2019). According to the SPM, in 2017, the overall SPM rate was 13.9% for all populations and 15.6 % for children (Fox, 2018). Even though the differences between these two measures were statistically significant at a 90% confidence level, both measures (OPM and SPM) showed that among different age groups, children were the most affected by poverty (Fox, 2019).

No matter how maltreatment is measured, it is universally agreed that it is common. Using official administrative data, around 4 million children are the subjects of at least one report to CPS annually (53.5 referrals per 1,000 children) (U.S. Department of Health & Human Services (U.S. DHHS, 2019). Some studies that link self-reports to official statistics indicate that the official data underestimate the actual prevalence (Gilbert et al., 2009). In one study, children

who were being monitored by agencies reported four to six times more episodes of abuse than did official records (Everson et al., 2008). Another study found that only 5% of children who were physically abused and 8% of those sexually abused were reported to the CPS agencies (MacMillan et al., 2003). Disparities between official records and community surveys are even more substantial for different age groups: there are increased risks of under-reporting of child maltreatment by parents of younger children and underestimated by child-protection agencies in older children (Gilbert et al., 2009). In addition, the annual estimates dramatically underestimate the cumulative number of children impacted. Interestingly, the lifetime estimates of child maltreatment measured by the self-report or official reports are about 30% (Finkelhor et al., 2015; Kim et al., 2017).

Similar to the variation in how maltreatment is defined and measured, there are differing views of what should or should not be considered an ACE. The original Adverse Childhood Experiences (ACEs) framework consisted of seven adverse childhood experiences like psychological, physical, and sexual abuse; violence against the mother; living with household members who were substance abusers, mentally ill (including suicidal), or ever imprisoned (Felitti et al., 1998). Although the original scale has been altered by various researchers to add and/or substitute other types of adverse experiences, all studies found childhood adversity to be common. According to the most recent estimations, more than 61% of adults had experienced at least one type of ACE, and almost one in six reported - four or more types of ACEs (Merrick et al., 2018). Prospectively, only 54% of children were classified in low ACEs class in the cohort study of children (Lacey et al., 2020).

Poly-victimization

In addition to trying to accurately define ACEs and maltreatment and poverty, there is a confound related to comorbidity. Studies show that experiencing child maltreatment and other types of violence increases the likelihood of experiencing other types of violence (Cyr et al., 2012; Finkelhor et al., 2009; Finkelhor et al., 2015). For example, having a past-year child maltreatment report was associated with a 2.1 times higher likelihood of experiencing a physical assault and a 2.0 times higher likelihood of sexual assaults, and risks for additional types of exposure were increased by at least a factor of 2 for most past-year and lifetime exposures (Finkelhor et al., 2015). All these make it difficult to understand even the prevalence of a given/isolated type of maltreatment in many data sources.

The Overlap of Poverty with Child Maltreatment and ACEs

Several studies indicate children of low-income and poor families are highly over-represented among the children reported to CPS for child abuse and neglect (Berger, 2004; Hussey, Chang, & Kotch, 2006; Pelton, 2015; Sedlak et al., 2010). According to the recent estimations, poverty prevalence among families reported to CPS is commonly over 60% although it varies by state (Kim, Drake, & Jonson-Reid, 2018). While some have suggested that is due to reporting bias, there has not been empirical support for class/surveillance bias explanations (Chaffin & Bard, 2006; Drake, Jonson-Reid & Kim, 2017; Jonson-Reid et al., 2009; McDaniel and Slack, 2005). Professionals make between 50 and 65% of reports depending on the state, but only 10% of reports were made by social services personnel (U.S. DHHS, 2022). Mandated reporters are also proportionally less likely to be the report source in lower income counties (Kim, Drake, Jonson-Reid, 2018). If children were being reported merely due to

poverty, their (behavioral, mental and physical health) outcomes for reported children should look similar to those of other poor children, but this is not consistent with the research (Jonson-Reid et al., 2009). However, as the evidence indicates, not only do children from lower SES households have a higher incidence of child maltreatment but also, they have worse outcomes (Jonson-Reid, Drake, & Kohl, 2009), including significantly higher hospitalization rates (the trend is generally consistent across all age groups and ethnicities (Irman, Cross & Das, 2019); and increased rates of fatalities (Farrell et al., 2017).

There are also theoretical and practical reasons to believe that poverty places families at greater risk, including its comorbidity with other risk factors like domestic violence, substance abuse, and mental illness (Fong, 2017). Dubowitz and his colleagues (2011) found that low-income mothers from urban areas had a higher relative risk for CPS involvement if the caregivers had more depressive symptoms (RR= 1.28, CI: 1.09–1.51, p=0.003) and ever used drugs (RR= 1.71, CI: 1.01–2.90, p=0.045). Considering the multiplicative relationships between risk factors, the authors argued that the risk ratio due to having multiple risk factors was equal to the product of the risk ratios for the individual risk factors (Dubowitz et al, 2011). However, as the family environment is often characterized by interplay of various risk factors and adversities (Dong, 2004; Fong, 2017; Warmingham et al., 2019), the concept of ACEs captures more attention from the researchers.

The data indicate that poverty and economic disadvantage are linked to location (Sharkey, 2013). By 2009, 10.5 % of poor people in US lived in in extreme-poverty neighborhoods—where at least 40 % of individuals lived below the poverty (Kneebone, Nadeau & Berube, 2011). As Coulton and her colleagues (2007) suggested both neighborhood structural

factors (e.g., concentrated disadvantage) and social processes (e.g., informal social control) play a role in incidents of child maltreatment. Sampson, Raudenbush & Earls (1997) found that high-poverty neighborhoods also tend to be racially segregated with high rates of crime and disorder and low-quality public services.

For the last two decades, numerous scholars have investigated community factors thought to be related to maltreatment (Ben-Arieh, 2010; Coulton, Korbin, & Su, 1999; Ernst, 2001; Freisthler, 2004; Freisthler, Bruce, & Needell, 2007; Freisthler, Gruenewald, Remer, Lery, & Needell, 2007; Freisthler, Gruenewald, Ring, & LaScala, 2008; Irwin, 2009; Kim, 2004; Korbin, Coulton, Chard, Platt-Houston, & Su, 1998). For instance, Drake and Pandey (1996) indicated that neighborhoods with low-poverty rates had the least number of reported and substantiated incidents, and the high poverty neighborhoods (40%+ of the poor population) had the most cases for all types of child abuse. They estimated that even though neglect was most strongly associated with poverty (ratio of 1:5:18 in low, moderate, and high poverty communities), the incidents of physical abuse were also heavily skewed (ratio of 1:3:7) indicating that high concentration of poverty could be a risk for child maltreatment.

The Present Study

Despite the consistent finding that ACEs and maltreatment are associated with poverty, much remains unknown about the potential causal nature and the magnitude of this relationship. Further, recent work on the nature of maltreatment and its co-occurrence with other forms of adverse experiences makes it important to be able to take this into account in regard to potential prevention and intervention policies or programs. Few longitudinal studies of maltreatment and/or ACEs exist and even fewer have adequate measurements of poverty and other

socioeconomic indicators over time. Poverty is not a unitary or static state, making longitudinal measures critical. This dissertation will conduct a secondary analysis of the Panel Study of Income Dynamics (PSID) to help address this gap. While not originally a study designed to focus on maltreatment or ACEs, the additional Child Development Supplement (CDS) introduced in 1997 and repeated over time along with the Childhood Retrospective Circumstances Study (CRCS) in 2014 that measured ACEs, provides the capacity to study the dynamic processes of early human and social capital formation, economic conditions, childhood proxies of maltreatment or poor parenting and direct retrospective measures of childhood adverse experiences.

The present study examines both prospective measures of harsh and neglectful parenting behaviors that have been used as proxies for maltreatment as well as retrospective recall of a number of ACEs. The combination of measures helps to address weaknesses in either alone. Prospective measures are likely to undercount the occurrence of adverse parenting behaviors due to biases in caregiver reporting (Hardt & Rutter, 2004), while retrospective measures may suffer from problems with recall (Reuben et al, 2016) and do not adequately capture more chronic negative parenting behaviors. Analyses of prospectively collected caregiver reported behaviors and parent-child interactions are complemented by analyses of retrospective recall of maltreatment and other adverse experiences over the years. First, analyses examine the dynamic relationship between various forms of family and community economic indicators and caregiver reported proxies for harsh and neglectful parenting. Second, analyses examine the relationship of childhood economic conditions and parenting behaviors are associated with adult recall of specific forms of abuse and neglect along with other adverse childhood experiences.

The following chapter will review the links between poverty and child maltreatment and other ACEs in more detail and the proposed theoretical framework. The chapter four will describe the methodology, chapter five – will provide the study results, and chapter seven will discuss the study findings and implications.

Chapter 2: Poverty, Child Maltreatment, and Other ACEs: Empirical Evidence

This chapter reviews research looking at the relationship between poverty (socio-economic status, income, welfare participation) and child maltreatment and other ACEs. Also, other covariates, such as community/neighborhood characteristics as well as family demographics, are addressed. First, a brief review of the measurement of maltreatment and ACEs is provided.

Measuring Child Maltreatment and ACEs

Child Maltreatment

Child maltreatment and other ACEs can be measured in a variety of ways including both self-report and the use of administrative records from child protective services and other health and social service organizations. There are pros and cons to the various approaches. Official records may miss cases that do not come to the attention of a service organization which nevertheless have important implications for a child's development. Self-report measures introduce potential bias in regard to accurate recall (Hardt & Rutter, 2004; Reuben et al, 2016) as well as potential problems in how questions might be asked or even what types of experiences are most important to capture (Cotter et al, 2018; Finkelhor, 2018). In some studies proxies for maltreatment in the form of risk for behaviors or behaviors thought to capture aspects of maltreatment have been used (e.g., Berger, 2004).

The Child Abuse Prevention and Treatment Act (CAPTA), (P.L. 100–294), amended by the CAPTA Reauthorization Act of 2010 (P.L. 111–320), defines child abuse and neglect in the U.S. as, at a minimum: “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 or exploitation; or an act or failure to act, which presents an imminent risk of serious harm” (section 3). Generally, child maltreatment includes reference to physical and sexual abuse as well as neglect. In the United States, some regions include additional actions or conditions such as prenatal substance exposure or emotional abuse (Children’s Bureau, 2019). However, some studies defined the constructs differently. For instance, the National Incidence Studies (Sedlak et al., 2010; Sedlak & Broadhurst, 1996) used cases provided by child protective services and community agencies (law enforcement, medical staff, teachers, etc.) from randomly selected counties for their analysis; The prevalence studies on Childhood Exposure to Violence, Crime, and Abuse (Finkelhor et al, 2013; Finkelhor Et al. 2015)) used self-report/caregiver reported Juvenile Victimization Questionnaire (JVQ) (Finkelhor, et al, 2005); National Survey of Child and Adolescent Well-Being (NSCAW) studies - Home Observation for Measurement Environment (HOME) Inventory (Bradley & Caldwell, 1984). Another popular self-report/caregiver’s reported instrument is Parent-Child Conflict Tactics Scale (Strauss et al, 1998).

Child maltreatment can include multiple types of maltreatment experiences but it is also common for a child to suffer multiple types of maltreatment simultaneously or over the course of their childhood. For instance, the official records show that while 84.5% of child victims suffered a single type of maltreatment, 15.5% of children had records of two or more types of maltreatment reports just in 2018 (U.S. DHHS, 2020). While 60.8% of victims were reported only due to neglect, 10.7% were reported for physical abuse, 7.0% were reported for sexual abuse (even though they could suffer the same types of maltreatment, but multiple times), and the remaining victims (15.5%) experienced a combination of various types of maltreatments (U.S. DHHS, 2020). However, the official records probably underestimate the co-occurrence

among multiple forms of maltreatment (Kim, Mennen & Trickett, 2017; McGee et al., 1995) as many studies show that co-occurrence of multiple types of child abuse and neglect often happens at higher rates both cross-sectionally and longitudinally (Boxer & Terranova 2008; Claussen & Crittenden, 1991; Higgins & McCabe, 2001; Jonson-Reid et al., 2003; Kim, Mennen & Trickett, 2017).

The likelihood of multi-type victimization makes it difficult to describe costs related to a given experience and link them to certain outcomes. Even though child maltreatment has been found to have a “dose-response” effect on outcomes (Jonson-Reid, Kohl, & Drake, 2012), it is still challenging to explain if this effect is due to the actual number of different types or a particular combination of types (Kim, Mennen & Trickett, 2017). The studies also show that maltreating familial context is often characterized by an interplay of risk factors (Fong, 2017; Vial et al., 2020; Warmingham et al., 2019), making it often challenging to isolate risk factors for a particular type of child maltreatment and their isolated effects on children’s functioning (Kim, Mennen & Trickett, 2017).

Adverse Childhood Experiences (ACEs)

Many families that experience poverty or abuse and neglect also experience other adversities such as substance abuse, mental illness, domestic violence and criminal justice involvement (Fong, 2017). Thus, increasing numbers of studies are trying to capture broader measures of childhood adversity. The original Adverse Childhood Experiences (ACEs) framework consisted of seven adverse childhood experiences like psychological, physical, or sexual abuse; violence against mother; or living with household members who were substance abusers, mentally ill or suicidal, or ever imprisoned (Felitti et al., 1998).

Initially developed to study the interrelated risks and generated insights into the origins of disorder and disease (Felitti et al., 1998; Mersky, Janczewski & Topitzes, 2017), the original research on ACEs used self-reported surveys among adult populations. As the initial items in ACEs were not selected based on a systematic process of measurement theory and population testing (an initial sample consisted of 79.8% of White participants), there are various attempts to revisit the scale with different questions and samples (Mersky, Janczewski & Topitzes, 2017). For instance, Cronholm et al., 2015 added: experience of racism, bullying, witnessing violence, living in an unsafe neighborhood, and having a history of living in foster care to the conventional ACEs. Finkelhor et al. (2015) added items from the Juvenile Victimization Questionnaire. Others added economic adversities/poverty measurements (Crouch et al., 2019; Finkelhor et al., 2013; Green et al., 2010; Laditka & Laditka, 2018; Lanier et al., 2018; Mersky, Janczewski & Topitzes, 2017). In addition to economic adversities (frequent family financial problems, food insecurity, homelessness), Mersky, Janczewski & Topitzes (2017) added even more items from the Behavioral Risk Factor Surveillance System (BRFSS) questionnaire, physical neglect and emotional neglect, prolonged parental absence, and death of parent or sibling, frequent peer victimization and violent crime victimization (total 17 items).

Studies have also found that experience of one of ACE increased the likelihood of experiencing additional ACEs (Dong et al., 2004; Lanier et al., 2018). Similar to research on child maltreatment, studies have also found a dose-response effect (Felitti et al, 1998; Lanier et al, 2018; Ramiro et al., 2010). There is also evidence that different forms of ACEs share some common risk factors (Brown et al., 1998; Dong et al., 2004; Soares et al, 2016; Thornberry et al., 2014). These findings regarding ACEs suggests that the adversities may not be easily characterized as independent events when examining prevalence, risk and protective factors, and

consequences (Soares et al., 2016). Thus, increasing numbers of studies are trying to capture broader measures of childhood adversity and related modifiable factors. However, the multifaceted natures of the experiences, numerous definitions of these constructs and associated high financial and social costs make such research both complex and essential in guiding preventive approaches (Gabrielli & Jackson, 2019).

Poverty, Socioeconomic Well-being, and Child Maltreatment

Family Financial hardship

Evidence from a number of studies over time indicates that material hardship and low SES among families are often present in child maltreatment cases (Pelton, 2015). Cox, Kotch, and Everson (2003) showed that family income adjusted for family size was a significant predictor of child maltreatment (t ratio for estimate = -2.10 ($p < 0.05$)). According to Berger and Brooks-Gunn (2005), family income below the poverty level increased the probability of maltreatment by 21.9 %. In addition, they showed that with the addition of the socioeconomic variables, the effect size of associated caregiver and child characteristics decreased. The association of maltreatment with maternal education decreased by 62.3 %, the birth weight effect by 18.8 %, and maternal prenatal substance (tobacco) use variables were no longer statistically significant.

Prior National Incidence Studies (NIS) found that family-level poverty (income) was associated with heightened risk for child abuse and neglect, regardless of whether maltreatment was reported to CPS (Sedlak & Broadhurst, 1996; Sedlak et al., 2010). The most recent National Incidence Study (NIS-4) estimated that overall child maltreatment incidence among low

socioeconomic¹ households is more than 5 times higher than in other households (22.5 children per 1,000 children vs. 4.4 children per 1,000 children) including a 3 times higher rate for abuse and 7 times higher rate for neglect (p.5-12) (Sedlak et al., 2010). Almost the same relative risk value of 4.94 for substantiated cases of child maltreatment was found to be associated with the households living under the federal poverty line by Daley and his colleagues in 2016. Families who experienced fatal child maltreatment were more likely to have financial problems than those of children who did not die from maltreatment (Douglas & Mohn, 2014).

The association between family poverty and maltreatment also appears to hold in self-report measures of poverty. Perceived parent- and family-level economic disadvantage and poverty (OR: 1.90, $p < 0.001$) were also associated with increased young adults' retrospective reports of child maltreatment, even after controlling other economic factors such as parental education, occupation, unemployment (OR: 1.56, $p < 0.001$) and house ownership (Doidge et al., 2017). Furthermore, Doidge and his colleagues estimated that 27% of all child maltreatment was jointly attributable to economic factors.

Family Material and Concrete Needs

Beyond income, material hardships (housing, utility, food, medical) have also been found to be positively and strongly associated with CPS involvement regardless of the types of reports investigated (OR=3.04 (SE=0.79) $p < 0.001$), even after controlling other socio-demographic and psychological distress variables (OR=3.27 (SE=0.93) $p < 0.001$) (Yang, 2015). Slack and colleagues (2004) found that CPS neglect reports were increased by 46% with a perceived

¹ a composite measure of family socioeconomic status (SES) was created with household income ($< \$15,000$), any household poverty-related program participation and parents' education variables (parents' highest education level was less than high school)

hardship scale² while controlling parenting, numerous demographic variables, and CPS involvement history³ (OR:1.46, SE=0.10, p<0.05).

Studies have also found associations between material hardship and behaviors associated with maltreatment. Marcal (2018) found that housing instability increased the expected number of maltreatment behaviors (b=0.99, p < .001) while younger mother's age (b=-0.05, p<0.001), race (for Black: b=0.36, p<0.05; Hispanic: -0.61, p<0.01), and stress (b=0.67, p<0.001) were all also significantly associated with increased maltreatment behaviors (Marcal, 2018). Brooks-Gunn, Schneider and Waldfogel (2013) found a significant association between the large decline in consumer confidence during the Great Recession, as measured by the Consumer Sentiment Index (CSI), was associated with increased levels of high frequency spanking (OR 1.067, p < 0.05), a parenting behavior that is associated with greater likelihood of being contacted by child protective services. This association remained significant even after controlling for spanking practices at the previous wave (before recession) (OR 1.070, p < .05), even though the official reports to CPS did not go up (Brooks-Gunn, Schneider and Waldfogel, 2013).

Another way of assessing the relationship between material needs and maltreatment is to assess whether maltreatment is impacted once needs are addressed. A small amount of funds for family emergency needs insufficiencies, such as utility payments, food, clothing for children, or transportation assistance (up to \$600 per family) were found to be associated with a significant reduction in recidivism of CPS referrals by 11% in first year (b=- 0.116, SE = 0.052, p = 0.026,

² Measured by measured by "My financial situation is better than it's been in a long time," "I worry about not having enough money in the future," "These days I can generally afford to buy the things we need," and "There never seems to be enough money to buy something or go somewhere just for fun."

³ Prior CPS involvement were associated with 18.84 fold increases in CPS neglect reports (OR: 18.84, SE=0.46, p<0.05) (Slack, Holl, McDaniel, Yoo nad Bolger, 2004)

HR = 0.890). The odds of a first-year re-report were reduced even further, to nearly 17% ($b = -0.185$, $SE = 0.085$, $p = 0.030$, $HR = 0.831$) while compared families who received funds with those who did not (Rostad, Rogers & Chaffin, 2017). Another study found that with provision of clothing and furniture supplies, the risk of maltreatment decreased (as measured by substantiated reports) by 18% ($OR = .82$, $p < 0.05$) (Ryan and Schuerman, 2004). In another study, material assistance was associated with lower rates of new reports for families with low SES (Relative Hazard (RH) = 0.589, $p = 0.038$) (Loman and Siegel, 2012).

Employment

In addition to family income and disposable income measures, changes in employment opportunities among poor families are also associated with a change in maltreatment likelihood. Employment might serve as an important buffering role for families, even in the absence of cash assistance (Conrad-Hiebner & Byram, 2020). A one-percentage-point increase in the current rate of unemployment within counties in Pennsylvania was associated with a 2.0 % ($p < 0.001$) increase in the count of CPS investigations and 2.4 % ($p = 0.009$) increase in substantiated CPS investigations, controlling for temporal effects (Frioux et al, 2014). Courtney, Dworsky, Pilavin & Zinn (2005) found that having worked at some point in the previous 12 months prior to the interview lowered the estimated hazard of CPS investigation among TANF applicants ($HR = 0.71$, $p < 0.05$).

The income from employment could help to mitigate the risk of CPS involvement. Slack and colleagues (2017) found that families receiving income neither from work nor welfare ($OR = 5.12$, $p < 0.10$) and only from welfare had a greater risk of CPS involvement ($OR = 4.34$, $p < 0.05$) in comparison to the families who worked. Moreover, the families who received only

welfare income but did not work were more likely (OR=1.84, $p < 0.10$) to have CPS involvement than the families who had income from both welfare and employment despite relatively similar income levels (the average income among families only on welfare was \$16,299 (\$11,884) and for families who worked and had welfare - \$17,724 (\$10,662)). Research also indicates that social safety nets can mitigate the effect of unemployment on neglect, but with small effects in states that introduce longer extensions to the duration of unemployment benefits (Brown & De Cao, 2017). Specifically, they found that a one-percentage-point increase in the unemployment rate with 55 weeks of benefits led to a 21 % increase in neglect, whilst 87 weeks of benefits led to only a 14 % increase (Brown & De Cao, 2018).

It should be noted that some studies have shown associations with employment and behavior that do not appear to be associated with CPS involvement. Schneider, Waldfogel & Brooks-Gunn (2017) found that a one-point decrease in Consumer Sentiment Index (CSI) was found to associated with a 4% increase in the odds of frequent physical aggression ($p < 0.05$) and a 2% increase in the odds of frequent psychological aggression ($p < 0.05$), while a one-point increase in the unemployment rate - with a 15% increase in the odds of frequent physical aggression ($p < 0.05$) and 12% increase in the odds of frequent psychological aggression ($p < 0.01$) (Schneider, Waldfogel & Brooks-Gunn, 2017). However, according to the official administrative data, the rate of substantiated child maltreatment cases during that period actually decreased (US Children's Bureau, 2010, 2011). As Frioux and her colleagues argue, low rate of substantiation during the recent recession may be reflective of other policy changes related to how cases were processed (Frioux et al, 2014). It is also worth mentioning that the study used by Schneider and colleagues (2017) included a sample where all families were low income at the child's birth.

However, not all work may have protective benefits. Han, Huang, & William (2013) found that working a nonstandard schedule was associated with increased odds for CPS involvement (OR 1.73-1.83, SE=0.35, $p<0.01$) in comparison to the families working on a standard schedule even after controlling for TANF and/or Food Stamps participation that was also associated with increased odds for CPS involvement in their models (OR=1.99-2, SE=0.39, $p<0.001$). They did not find any significant differences between families working on regular schedules and who had never worked before (OR=0.77, SE=31, $p>0.05$). This may reflect difficulties in accessing childcare. Indeed, Klevens and colleagues (2015) found that states with reduced waitlists for subsidized childcare and policies that provided for continuity in child health care had reduced maltreatment rates controlling for other indicators of poverty, unemployment, and other policies.

Welfare Participation

The relationship between welfare participation and child maltreatment is somewhat counterintuitive given the aforementioned findings regarding income and material hardships. Participation in welfare programs has been found to be associated with higher rates of child maltreatment (Mersky et al., 2009), specifically for physical abuse (OR 3.74, 95%CI: 1.78–7.85) and neglect (OR 11.01 95%CI:5.61-21.58) (Brown et al., 1998). Families that continued to be eligible for Medicaid after exiting TANF (HR= 1.568, $p<0.001$) and those who involuntarily exited the program were at increased risk of a substantiated child maltreatment (HR= 1.224, $p=0.005$) (Ovwigo, Leavitt & Born, 2003). The recipients of food stamps had a 20.1% ($p<0.05$) higher risk of CPS involvement (Ovwigo, Leavitt & Born, 2003) in one study, but lower risks of substantiated reports in another (HR=0.808, $p=0.012$) (Beimers and Counton, 2011).

Of course, such associations do not indicate that welfare participation causes maltreatment. Material hardship or reasons for welfare participation as compared to income transfers themselves may be precipitating factors. For example, Conrad-Hiebner and Paschall (2017) showed that families with high-income transfers and high hardships and those with low public-income transfers and high bill-paying hardships were most likely to spank and perpetrate physical aggression (72.1% - 73.2%). These two classes perpetrated the most spanking ($M = 2.71-2.83$) and physical aggression ($M = 4.00-4.19$) in comparison to the families who had high food stamps and low hardships and/or those who had low-income transfers, but low hardships as well. Dubowitz and his colleagues (2011) found that low-income mothers from urban areas had higher relative risk for CPS involvement if they were recipients of Food Stamps and WIC (88% vs 73%, $p < 0.01$), less educated ($RR = 1.55$, $CI: 1.01-2.38$, $p = 0.44$) and had more children ($RR = 1.26$, $CI: 1.07-1.47$, $p = 0.005$). In other words, the underlying reasons for participation and risk characteristics of some recipients of welfare receipt may be driving such associations.

Studies show timing of the participation and duration in the welfare programs might also matter. Cancian and colleagues (2013) found that the odds of child maltreatment were 31% higher among families who were AFDC recipients in the most recent 1-18 months before assessment ($OR = 1.312$ ($p < 0.05$), but the relationship diminished for families who had exited from earlier welfare spells (Cancian, Yang & Slack, 2013). According to Kim and Drake (2017), the predicted number of maltreatment reports increased by between 2.5 and 3.7 times as duration in poverty-related programs increased from 0 to 9 years, and this relationship was consistent between Whites and non-Whites (over 98% Black), but non-Whites showed a significantly lower number of total maltreatment reports while controlling for a duration in poverty-related programs. It may be the current economic crises that precipitate participation are more

indicative of risk and that families that are able to exit welfare successfully have been able to develop more resources to withstand risk. The longer duration on welfare may be a proxy for increased problems that form barriers to exiting welfare.

Cash assistance

Emerging research indicates relatively modest economic interventions can reduce the risk for child maltreatment. Specifically, each \$100 monthly earned income increase from employment after TANF, was associated with decreased risk of CPS involvement by 1.3% (OR=0.705, $p<0.01$) (Ovwigbo, Leavitt & Born, 2003); the estimated hazard of a substantiated or indicated finding of maltreatment in another analysis decreased by 2.2% (HR = 0.978, $p<0.001$) (Beimers & Counton, 2011). Cancian, Yang & Slack (2013) also found that a modest addition (approximately \$102) in average monthly income experienced in an experimental group was associated with moderate (10%), but significant, reduction in screened-in (investigated) child abuse and neglect reports over a two-year period (odds ratio 0.881(0.05), $p<0.05$) (Cancian, Yang & Slack, 2013). Berger et al (2017) hypothesized that the link between income and child maltreatment may be strongest among relatively lower-income families and estimated that \$1,000 exogenous increase in income to be associated with roughly a 1.0 to 1.2 % point (3% to 4%) decrease in behaviorally-approximated neglect and a 0.58 to 0.70 % point (8% to 10%) decrease in CPS involvement among urban low-income single-mother families.

Poverty and ACEs

As stated previously, maltreatment is only one ACE and is often correlated with other forms of adversity. Poverty and low socio-economic status (SES) have been considered as risk

factors for many childhood adversities (Lacey et al, 2020; Liming, 2019; Metzler et al., 2017; Steele et al., 2016; Walsh et al., 2019). In fact, childhood poverty is associated with so many other childhood adversities that it is sometimes considered an ACE itself (Hughes & Tucker, 2018). So, it is not surprising that some updated ACEs scales include some measurement of poverty (Crouch et al, 2019; Finkelhor, Shattuck, Turner & Hamby, 2015; Finkelhor, Shattuck, Turner & Hamby, 2013; Laditka & Laditka, 2018; Lanier et al, 2018; Mersky, Janczewski & Topitzes, 2017). However, poverty is different to many other psychosocial adversities used in the original scale, such as maltreatment and mental health or substance abuse problems (Lacey et al, 2020). The ACEs have also been found to be associated with neighborhood disadvantages as well (Baglivio et al, 2017; Lewer et al., 2020).

Poverty is also associated with endorsing more adverse childhood experiences. Several studies showed that people with fewer economic resources tend to report higher ACE scores (Liming, 2019; Metzler et al., 2017; Steele et al., 2016). While exploring the clustering of ACEs, Lacey et al (2020) found that children whose parents had experienced poverty during pregnancy were more likely to be in a “poly adversity” cluster. The authors also emphasized that the specific patterning of adversity might be important beyond the number of ACEs reported as it was suggested earlier by Lanier et al. in 2018. Moreover, Soares et al (2016) showed that the income change from birth to adolescence might play a role in the prevalence of ACEs as the odds ratio of ACEs was highest in those who were not poor at birth and became poor at 15 years old. Even though the family income change could be a consequence of some of the adversities, particularly parental separation (or parental abandonment in some cases) or parental death (Soares et al., 2016), nevertheless lower household income (measured as percentages of the

federal poverty level, or family income for Medicaid eligibility) was associated with increased odds of exposure to various ACEs categories (Crouch et al., 2019).

The most recent systematic review (Walsh et al., 2019) showed that there is a clear relationship between socioeconomic status (SES) in childhood and risk of experiencing ACEs despite varying measures used for SES and ACEs and the child's age at which adversity was measured. However, the authors suggested that more research should be done to understand the role of SES in childhood in experiencing ACEs as a limited amount of empirical literature exists exploring the direct and indirect relationships between economic hardship and increased exposure to ACEs (Walsh et al, 2019). Also, as overlap exists between the risk factors and outcomes associated with childhood exposure to poverty and ACEs, there is a need for research to advance the current literature base examining the differentiating effects of economic instability and the association with ACE exposure (Liming, 2019).

Other Potential Covariates of Maltreatment and ACEs

Of course, an individual family's poverty alone is not the only commonly noted risk factor in regard to maltreatment (NRC, 2014). Neighborhood structural characteristics, such as poverty and population instability have been identified as major risk factors that are mediated through community-level social processes (social cohesion, collective efficacy) to influence the functioning of families and children (social capital within the family) (Sampson, 1992; Shaw and McKay, 1942). According to Maguire-Jack (2014), parents in distressed neighborhoods might be at higher risk for child maltreatment due to multiple stressors such as lack of available resources and the lack of social norms supporting positive parenting. O'Brien Caughy & Franzini (2005) also emphasized the importance of community attitudes (norms) regarding child rearing practices

as a key effect of neighborhoods on parenting through the socializing effect of normative patterns of childrearing. Community social disorganization may contribute to ineffective parenting by compromising parental psychological well-being (Simons, Johnson, Conger, and Lorenz, 1997).

Also, poverty may either create stressful conditions that reduces a parent's capacity to care for a child properly or there may be a subset of poor families whose socioeconomic and parenting struggles are related to other underlying problems, such as mental health difficulties or substance abuse (Jonson-Reid & Drake, 2018; Jonson-Reid et al, 2020). However, there is often less data on causal association of these risk factors as compared to comorbidity because of the nature of the design of existing studies (Jonson-Reid et al, 2020). The importance of domestic violence (Felitti et al., 1998; Guedes & Mikton, 2013; Hamby et al, 2010), mother's mental health (Chemtob, Gudiño & Laraque, 2013; Dong et al, 2004; Hammen & Brennan, 2003; Kim & Maguire-Jack, 2015; Victor et al, 2019) and substance abuse (Fuller-Thomson & Sawyer, 2014; Crowley et al, 2019) also known as "toxic triad" (Fuller-Thomson et al, 2019; Skinner et al, 2021) is reflected in the ACEs.

However, when discussing poverty and child maltreatment and ACEs, the data indicates family demographics (race, mother's age) and child's health should be also considered.

Mother's Age

As the data indicates, poverty is not equally distributed by age, gender or educational status. According to Census (2018), 56% of all people living below the official poverty line were females, 9.2% of all poor had bachelor's degree or higher (incidents of poverty increased with

decreased educational attainment) in 2017 (Fontenot, Semega, & Kollar, 2018). Also, while children under 18 years old were only 22.7% of the overall population, they were the almost third of all poor (32.3%). Among poor households, 51% were female householders without (married) husband present (Fontenot, Semega, & Kollar, 2018).

Young (below 18 years old) mothers tend to face poverty, social isolation, and single parent status more often and combined with their immaturity may compromise their ability to provide adequate care (Bartlett & Easterbrooks, 2015; Borkowski et al, 2007; Goldman, 2003; Slack et al., 2004). These mothers are considered at-risk for parenting that lacks sensitivity and responsiveness and tend to practice more harsh parenting (Lounds et al., 2006; Tamis-Lemonda, Shannon, & Spellmann, 2002). Research suggests young mothers are more likely to neglect their infants than are adult mothers (Stier et al, 1993; Whitman et al, 2001; Zuravin & DiBlasio, 1992). The evidence however is mixed. Some studies still talk about positive trajectories among some young mothers and hypothesized that early parenthood could mark a “positive new beginning” and a positive entry into adulthood among mothers for whom economic and educational opportunities may be limited (Borkowski et al., 2007; Leadbeater & Way, 2001; Marsiglio, 2004). For other young mothers, the tasks and responsibilities of parenting may clash with their typical adolescent behavior (spontaneity, freedom, and autonomy) compromise developmental adaptation for both the young women and their children (Easterbrooks et al, 2011). Research indicates that young mothers are likely more at risk for abusing their children if other stressors, such as low family cohesion, high family conflict, or poor educational achievement are present (Kinard, 2003; McCullough M, Scherman 2004). And according to some estimates, children of young mothers are twice as likely to be victims of child maltreatment

(perpetrated by their mothers and by others) than are children of older mothers (Easterbrooks et al, 2011).

Race

The Census data indicates while racial and ethnic minorities comprise 39.5% of the population, they are 57.2% of those categorized as officially poor (Hispanics of any race 27.2%, Blacks 22.7% and Asians 4.9%) (Fontenot, Semega, & Kollar, 2018). Moreover, not only are Blacks and Hispanics more likely to be poor, but they also tend to live in poor neighborhoods (Kneebone & Holmes, 2016). Poor Hispanics were more than three times and poor Blacks were almost five times as likely as poor Whites to live in an extremely poor neighborhood (Kneebone & Holmes, 2016). Between 2005-2014, the share of poor residents living in distressed neighborhoods climbed by 3.9 % points for Blacks and 4.7 % points for Hispanics compared to a modest increase of 1.4 % for Whites (Kneebone & Holmes, 2016). Poor minority children were even more likely to live in high-poverty neighborhoods than poor adults and this trend is different for different racial groups: while 28% poor Black children and 18.1% of Hispanic poor children under six years of age live in poverty concentration, only 6.2% poor White children were less likely to live in high-poverty neighborhoods (Jargowsky, 2015).

Benefits to offset poverty may also be differentially associated with race. States with larger percentages of Black residents are less likely to prioritize the “provision of cash assistance” (Parolin, 2019). Similarly, Brown and Best (2017) found that the states with larger Black populations implemented less generous TANF programs. Holding age and Hispanic population constant, they estimated that a state with 10 percent more Black residents (a one SD increase) would have a \$110 lower income cutoff for TANF eligibility. They also found that

even though states with a higher cost of living had significantly higher eligibility cutoffs, states do not seem to adjust for relative poverty and the states with higher median incomes had significantly lower TANF cutoffs.

The latest NIS-4 was the first incidence study not based on solely on official reports that demonstrated race differences in maltreatment rates, with Black children experiencing maltreatment at higher rates than White children in several categories (Sedlak et al, 2010). Specifically, they found that the rate for Black children (6.6 per 1,000) was notably higher than the rate for White children (3.2 per 1,000). In addition, they estimated that in low SES households (the higher-risk situation), the difference between Black and White children's marginal probabilities of maltreatment was comparatively smaller, at less than one tenth of one percent (.0062 versus .0053), not statistically significant. However, in non-poor households, Black children have significantly higher risk of experiencing Harm Standard physical abuse than White children (.0039 versus .0021). When comparing for the same 2006 administrative data, a victimization rate for Black children of 19.8 per 1000 children and a victimization rate of 10.7 per 1000 for White children (US DHHS, 2008), almost the same 1.85 times as likely as White children to be officially reported to child welfare agencies and classified as victims of maltreatment (Drake & Jonson-Reid, 2011).

The rationale for overrepresentation of racial minority children in the child welfare system and the consistency of data related to maltreatment reporting is often in question. The most recent child maltreatment report summary indicates that, among children with substantiated reports, 0.8% were Asian (while Asian children were 5.3% of all children), 20.68% were Black (15.1% of all children), 22.32% were categorized as Hispanics (25.2% of all children) and

44.64% were White (72.4% of all children) (Census, 2018; U.S. DHHS, 2019). These disparities are also apparent in lifetime measures. For example, 37.4% of all U.S. children will be the subject of a Child Protective Service (CPS) investigation before reaching adulthood but the number reaches 53.0% for Black children (Kim, Wildeman, Jonson-Reid, & Drake, 2017). Wildeman and colleagues (2014) found that 12.5% of all children but 20.9% of Black children will have substantiated reports of maltreatment before age 18.

Disproportionality in CPS contact has been a matter of significant concern in policy and research (Boyd 2014; Miller et al, 2013; Krase, 2013; 2015). The studies controlling for poverty, however, do not support the idea that over-representation of Black children (the focus of most US studies) in child welfare can be explained by racial bias. Irwin (2009) showed that after controlling for individual (race, mothers age, marital status, education, income) and neighborhood (measured by census tracts) factors (% unemployed residents, % poor persons, % Black residents, % female headed households with children <18, % vacant housing units etc.), the increased risk for Black children becomes no longer significant predictor for either investigated reports of child neglect or substantiated/indicated reports of child maltreatment. Similar findings are reported in research looking at community level data. Kim and Drake (2018) found that Black/White disproportionality in official maltreatment reports at the county level was largely driven by Black/White differences in poverty. As child poverty rates increased so did total and type-specific official maltreatment rates. The mean county rate of total maltreatment reports was highest at 8.38% (SD= 4.16, range=1.19 - 23.03) for Black children, followed by White children at 4.88% (SD=2.69, range=0.28-15.34) and Hispanic children at 3.96% (SD=2.02, range=0.21-11.70). At similar poverty levels, however, maltreatment rates for White children trended higher than for Black children. At the 25% poverty level, total maltreatment

report rates were 6.91% [95% CI: 6.43%–7.40%] for White children, 6.30% (95% CI: 5.50%–7.11%) for Black children but 3.32% (95% CI: 2.88%–3.76%) for Hispanic children. In other words, the differential likelihood of being poor as a child of color may be explaining the differential in reporting.

Indeed, after controlling for poverty, there is some concern that Black children may be even under reported. Recent studies found significantly lower risk of maltreatment reporting among poor Black children compared to poor White children (Cancian et al., 2013; Dworsky et al., 2007; Kim and Drake, 2017; Putnam-Hornstein et al., 2013). For instance, Kim and Drake (2017) found that after considering duration in poverty-related programs and baseline neighborhood poverty, the number of maltreatment reports from birth to age 15 was 30% lower for non-Whites (over 98% Black) in comparison to Whites (Kim and Drake, 2017). Putnam-Hornstein and her colleagues (2013) also found that Black children were less likely than other socio-demographically similar White children to be referred for maltreatment (RR: 0.95; 95% CI: 0.92 -0.97), substantiated as victims (RR: 0.79; 95% CI: 0.76, 0.83), or placed in foster care (RR: 0.81; 95% CI: 0.76, 0.86) before age 5.

Of note, the lower rate for Hispanic children after controlling for poverty is consistent with other studies across a number of maternal and child health outcomes (Drake et al., 2011). A similar result was also reported in a study of Latino children in the NSCAW dataset, although the trend appears somewhat different for US born compared to foreign born children (Detlaff & Johnson, 2011). The Hispanic paradox (also found in many immigrant populations) appears across a number of maternal child health domains, but may decay across generations (Langellier

et al, 2021). While a number of hypotheses have been raised for this phenomenon, there is no single well-established explanation.

There is also a significant overrepresentation of Native American Indian children in child welfare system (Crofoot & Harris, 2012; Duran et al, 2004). These children had the highest rate of victimization (at 14.3 per 1,000 children in the population of the same race or ethnicity) (US.DHHS, 2019). The actual number might be even higher as only 61% of the data on American Indian child maltreatment ever reaches the NCANDS (official registers) (Fox, 2003). Some nationally recognized tribes have their own child welfare systems and do not always cross report to the state (Fox, 2003).

Many ethnic and immigrant populations have received very little attention in the research (Millet, 2016; Zhai & Gao, 2009). This is in part to ways in which these groups are represented in the regions in which studies are done and in part due to the way in which studies do or do not identify certain groups. For example, there is no means of identifying nativity in the national child maltreatment data (US DHHS, 2019). Further overall categories mask important variabilities within group differences. For example, while Asian children are underrepresented in CPS reporting overall, the patterns vary greatly among subgroups within this population (Zhai and Gao, 2009).

Similar to child maltreatment alone, the recent estimates showed overall risk for ACEs is not distributed equally (Sacks & Murphey, 2018). For instance, nationally, one in three Black non-Hispanic children have experienced two and more ACEs, compared to only one in five White non-Hispanic children (Sacks & Murphey, 2018). Also, while 60 percent of White non-Hispanic children reported no ACEs, this is the case for only 49 percent of Hispanic children and

39 percent of Black non-Hispanic children (Sacks & Murphey, 2018). However, among low-income population, non-Hispanic Whites reported the highest prevalence of any abuse or neglect (61.6%), specifically highest rates of physical abuse (43.6%), sexual abuse (30.1%), and emotional abuse (33.6%) (Mersky, & Janczewski, 2018). Mersky and Janczewski (2018) also showed that among low-income households, Hispanics had the lowest mean ACE score (2.72) of all racial/ethnic groups. The mean score for Blacks (2.80) and participants coded as other race (3.25) were significantly lower than the mean score for Whites (3.80) and American Indians (3.92).

Child Health

In general, children are vulnerable to maltreatment, in part because they depend on others for their care. Arguably, that dependence is even higher for children with an underlying disability or serious health concern (Kerns et al., 2015). In addition, limited social opportunities, lack of assertiveness and self-esteem, and their overall lack of understanding of what contributes to, or constitutes abuse, contributes to abuse vulnerability and victimization in this population (Reese & Deutsch, 2020).

While one previous meta-analysis showed that the effect size of a child's disability was not significant for child maltreatment (Stith et al, 2009), a more recent meta-analysis showed that there were 3.68 (2.56–5.29) odds ratios for pooled risk estimates for combined violence measures, 3.56 (2.80–4.52) for physical violence, and 2.88 (2.24–3.69) for sexual violence (Jones et al, 2012). Research indicates that children with disabilities reported to CPS represent 25.9% of children with CPS reports and 29.0% of those with substantiated cases even though they make up only 10.4% of total population (Maclean et al, 2017). Specifically, children with

intellectual disability, mental/behavioral problems, and conduct disorder have increased risk of CPS reports and substantiation after adjusting for child, family, and neighborhood risk factors (Maclean et al, 2017; Jaudes & Mackey-Bilaver, 2008). Studies suggest that the subset of children and youth with intellectual and developmental disabilities specifically is 1.5-3 times more likely to be maltreated when compared with their peers (Fisher et al, 2019; Hibbard & Desch, 2007; Reese & Deutsch, 2020; Reiter, Bryen, & Shachar, 2007).

Contextual Factors: Neighborhood Structural Factors

As the data indicate, poverty and economic disadvantage is linked to location (Sharkey, 2013). By 2009, 10.5 % of poor people in the US lived in extreme-poverty neighborhoods—where at least 40 % of individuals lived below the poverty line (Kneebone, Nadeau & Berube, 2011). As Coulton and colleagues (2007) suggested, both neighborhood structural factors (e.g., concentrated disadvantage) and social processes (e.g., informal social control) play a role in incidents of child maltreatment. Sampson, Raudenbush & Earls (1997) found that high-poverty neighborhoods also tend to be racially segregated with high rates of crime and disorder and low-quality public services.

For the last two decades, numerous scholars have investigated community factors in the context of maltreatment (Ben-Arieh, 2010; Coulton, Korbin, & Su, 1999; Ernst, 2001; Freisthler, 2004; Freisthler, Bruce, & Needell, 2007; Freisthler, Gruenewald, Remer, Lery, & Needell, 2007; Freisthler, Gruenewald, Ring, & LaScala, 2008; Irwin, 2009; Kim, 2004; Korbin, Coulton, Chard, Platt-Houston, & Su, 1998). The most recent review found that neighborhood impoverishment (most often measured by % of residents below the poverty line, % on public assistance, % of female-headed families, % residents unemployed, % population younger than 18

years, % Black, % vacant housing units, median family income, proportion under various cut-offs for income (\$15,000; \$25,000; \$50,000; \$75,000), proportion of families living below the poverty line, etc.) was consistently associated with child maltreatment while using multilevel modeling that simultaneously estimates the neighborhood and individual influences on child maltreatment (Maguire-Jack, 2014). For instance, in an early study Drake and Pandey (1996) indicated that neighborhoods with low poverty rates had the least number of reported and substantiated incidents and the high poverty neighborhoods (40%+ of poor population) had the most cases for all types of child abuse. They estimated that even though neglect was most strongly associated with poverty (ratio of 1: 5 :18 in low, moderate, and high poverty communities), the incidents of physical abuse was also heavily skewed (ratio of 1: 3:7) indicating that high concentration of poverty could be a risk for child maltreatment. On the other hand, children who live in higher quality neighborhoods were 26% times less likely to experience physical neglect in comparison to children who lived in lower quality neighborhoods even after controlling individual characteristics such as maternal age, family structure and income/needs ratio (Shanahan et al., 2017).

Maguire-Jack and Font (2017) showed that among poor residents from high-poverty neighborhoods, there were increased odds for any neglect (OR: 3.01, $p < 0.001$), physical assaults (OR: 1.77, $p < 0.05$) and psychological aggression (OR: 2.04, $p < 0.01$). High-poverty neighborhoods were associated with increased odds for any type of neglect even non-poor residents (OR: 2.14, $p < 0.05$), however impacts on physical assaults (OR: 1.01, $p > 0.05$) and psychological aggression (OR: 1.07, $p > 0.5$) were not statistically significant. Shanahan and colleagues (2017) also found that the children who live in higher quality neighborhoods were 26% less likely to experience physical neglect in comparison to children who lived in lower

quality neighborhoods (OR=0.74, 95% CI: 0.57=0.96; $p = 0.03$) while controlling individual characteristics such as maternal age, family structure an income/needs ratio. However, in low-poverty (affluent) neighborhoods, individual poverty in the absence of neighborhood poverty predicts increased odds for neglect (OR: 2.08, $p<0.01$), physical assaults (OR: 1.72, $p<0.01$) and psychological aggression (OR: 2.02, $p<0.001$) (Maguire-Jack & Font, 2017).

Other studies have examined macro level economic factors and maltreatment. Even a modest increase of \$1.00/hour in state minimum wages has been associated with a decline in overall child abuse and neglect reports, including a 9.6% decrease in neglect reports (Raissian, & Bullinger, 2017). While exploring impacts of exogenous shocks on families' disposable income, McLaughlin (2017) found that while holding other factors constant, a one-dollar increase in the price of gas for a state with 100,000 children would be associated with an additional 642 child maltreatment referrals; and a one-dollar increase in a state's cigarette tax rate could also lead to an additional 12 referrals to CPS for child maltreatment per 1000 children living in a state (McLaughlin, 2018). According to Cherry and Wang (2016), for every 10% decline in the male state employment rate among 20-34-year-olds, the child maltreatment rate rises by 9.62%; Another study found that 0.01% increases in the state unemployment rate was associated with a 9 point increase in maltreatment rate ($b=8.71$, $p=0.05$) (Millett, Lanier & Drake, 2011). A one percentage-point increase in the county unemployment rate was linked to a 20% increase in neglect translating into additional 110 cases per year for the county's the median prevalence of neglect (536 cases per year) (Brown & De Cao, 2017). In California, Nguyen (2013) found that every 1% increase in county level employment, there is a decrease of 0.141 open child protective services cases per 1,000 children. Raissian (2015) also found that a 1 percentage-point increase

in unemployment county rates (New York) reduced the child report rate by approximately 4.25%, but as the unemployment reached high levels, child maltreatment began to rise.

Studies indicate that housing concerns are a significant source of stress within communities and an indication for community maltreatment rates (Wood et al, 2012). With every \$100,000 increase in median home prices, there was an increase of 0.053 open child protective services cases (Nguyen, 2013). Also, the rate of admissions for physical abuse to pediatric hospitals increased in line with the housing mortgage crisis during the recession in 2009 in comparison to 2008 (Wood et al, 2012). In addition, while the presence of abandoned houses and/or the lack of recreational centers, can be stressors themselves and thus critically alter families' thresholds for navigating their everyday pressures, the housing density, may work to mitigate the risk of maltreatment, either by promoting social support or by increasing the likelihood that maltreatment is reported to authorities (Haas et al, 2018).

Contextual Factors: Neighborhood Processes

Protective factors at the community level for families like social cohesion tend to be less prevalent in poor communities (Coleman, 1988). Cao & Maguire-Jack (2016) found that negatively perceived neighborhood processes (such as social disorder, informal social control and social cohesion) were directly associated with more mothers' physical abusive behavior ($\beta=0.12$, $SE=0.04$, $p<0.01$) and psychological abuse ($\beta= 0.21$, $SE = 0.04$, $p < 0.001$). They also found that even though there was no direct and significant association, mothers' perceptions of negative neighborhood processes positively predicted reported neglect behaviors through the pathway of their internal control ($\beta= 0.03$, $SE = 0.01$, $p < 0.01$). Other studies found that higher levels of neighborhood social disorder were related to more frequent physical abuse (Freisthler

and Maguire-Jack, 2015) while higher levels of neighborhood social cohesion were related to lower rates of child neglect (Maguire-Jack & Wang, 2016; Maguire-Jack & Showalter, 2016).

Collective efficacy is another measure of neighborhood process that is associated with perception of the ability to act. Higher levels of collective efficacy have been found to be associated with lower rates of child abuse (Freisthler & Maguire-Jack, 2015; Molnar et al., 2016) and lower odds of CPS involvement (OR=.80, 95% CI 0.670–0.951) (Ma, Grogan-Kaylor & Klein, 2018). McLeigh, McDonell & Lavenda (2018) also reported that children who lived in higher quality neighborhoods/less poor were less likely to experience physical neglect than children who lived in lower quality neighborhoods. While controlling for participants' age, marital status, ethnicity, and parental efficacy, they showed the mediating role of social cohesion in the association between poverty and abuse: social cohesion could decrease child maltreatment ($B = -2.271$, $SE = 0.768$, $p = .003$), however poverty could negatively affect social cohesion ($B = -0.0004$, $SE = 0.0001$, $p < .01$) (McLeigh, McDonell, Lavenda, 2018)

Conclusion

Even though child abuse occurs in all social classes and most parents living in poverty do not abuse their children, it is evident that poverty (as measured in a variety of ways) is associated with greater risk. The particular mechanism involved in this relationship is less clear. For example, many studies indicate poverty increases odds for child maltreatment significantly (Berger and Brooks-Gunn, 2005; Brown, Cohen, Johnson, & Salzinger, 1998; Doidge et al., 2017; Mersky, Berger, Reynolds & Gromoske, 2009; Slack, Holl, McDaniel, Yoo and Bolger, 2004; Yang, 2015). On the other hand, even modest increases in income/material support have been associated with significantly reduced CPS involvement (Berger, Font, Slack and Waldfogel,

2017; Loman and Siegel, 2012; Ovwigho, Leavitt & Born, 2003; Rostad, Rogers & Chaffin, 2017) and screened-in (investigated) reports (Beimers and Counton, 2011; Cancian, et al., 2013; Ovwigho, et al., 2003; Ryan and Schuerman, 2004). This appears to obtain even when the change in income does not lift a family out of poverty. A similar buffering association of employment appears even among families that are still considered poor (e.g., Brown & De Cao, 2017; Courtney and colleagues, 2005).

In other words, it does not appear that the relationship between lower SES and maltreatment is best described by a particular income level but rather whether resources are available to mitigate severe hardships as distribution and access to services at the community level also appears to be important. Higher density of child welfare services, housing and housing-related services within and surrounding zip code areas were associated to lower rates of CPS referrals and behavior (Freistler, 2013; Maguire-Jack, 2015; Maguire-Jack & Negash, 2016; Morton, 2013; Shuey & Leventhal, 2015). Certain types of economic and social policy environments at the county or state levels also appears to offset some of the risk of maltreatment (e.g., Klevens et al., 2015; McLaughlin & Jonson-Reid, 2017), though how these policies are connected to family processes is less clear. Beyond structural factors, neighborhood social processes also affect the CPS involvement and child abuse and neglect behaviors (Cao & Maguire-Jack, 2016; Freisthler and Maguire-Jack, 2015; McLeigh, McDonnellb, Lavenda, 2018). It is less clear, however, if the social processes are independent of other factors like the density of concrete services and more family friendly policies.

Finally, it is unclear how poverty contributes to, is comorbid with, or results from other family level risks. For instance, child's health might be a risk factor for child maltreatment as

children with intellectual disability, mental/behavioral problems, and conduct disorder have increased risk of CPS reports and substantiation after adjusting for child, family, and neighborhood risk factors (Maclean et al, 2017; Jaudes & Mackey-Bilaver, 2008). Studies suggest that the subset of children and youth with intellectual and developmental disabilities specifically is 1.5-3 times more likely to be maltreated when compared with their peers (Fisher et al, 2019; Hibbard & Desch, 2007; Reese & Deutsch, 2020; Reiter, Bryen, & Shachar, 2007). Also, according to some estimates, children of young mothers are twice as likely to be victims of child maltreatment (perpetrated by their mothers and by others) than are children of older mothers (Easterbrooks et al, 2011). Research also suggests young mothers are more likely to neglect their infants than are adult mothers (Stier et al, 1993; Whitman et al, 2001; Zuravin & DiBlasio, 1992). Fong (2017) emphasized the comorbidity of poverty with some other risk factors like domestic violence, substance abuse and mental illness. Dubowitz and colleagues (2011) suggest having multiple risk factors are equal to the product of the risk ratios for the individual risk factors taking into account multiplicative relationships between risk factors. Some research also showed that differential assortment may be at play in regard to which families are poor and become limited to living in low-income communities which impacts its association with maltreatment (Maguire-Jack et al., 2015). In other words, persons with accumulated barriers like health and mental health issues that preclude access to work or educational opportunities may lead to concentration in low-income neighborhoods. Conversely, lack of opportunity and exposure to exogenous risk may lead to poverty which in turn may increase the risk of poor health or mental health. Further work is needed to understand the temporal dimensions of individual, social and economic risks and how these factors may be associated. It is also possible

that the associations may vary by other regional and individual demographic factors. The next chapter explores theoretical explanations for the relationship between poverty and maltreatment.

Chapter 3: Theoretical framework

As the National Research Council (2014) summarized, research on the etiology of child maltreatment is complicated due to the multiple associated risk and protective factors and changing political and historical definitions of the behavior. Scholars have posited a number of factors in their frameworks that may cause child maltreatment including social isolation (DePanfilis, 1996; Ammerman, 1989), stress (Fanshel et al., 1992), comorbid mental health disorders (McCord, 1983), lack of knowledge about child development and rearing (Wolfe, 1999), contributing to child behavior (including the lack of knowledge of self-protective behaviors) (Fanshel et al., 1992) and the social context of parent-child relationships (Wolfe, 1999). This chapter focuses on theoretical frameworks relevant for better understanding of associations between poverty and child maltreatment.

Ecological Paradigm

Since the 1980s, the field of maltreatment research has been dominated by the ecological paradigm. It all started with Belsky (1980), who proposed adapting the ecological framework (Bronfenbrenner, 1979; 1999) while focusing on a complex interaction of factors to explore the etiology of child maltreatment. He conceptualized child maltreatment as “a social-psychological phenomenon” (Belsky, 1980, p.320). In this model, risk for child maltreatment was conferred at the individual level with childhood exposure to violence, history of maltreatment, decreased nurturance, aggression, parental rejection, little child care experience (individual

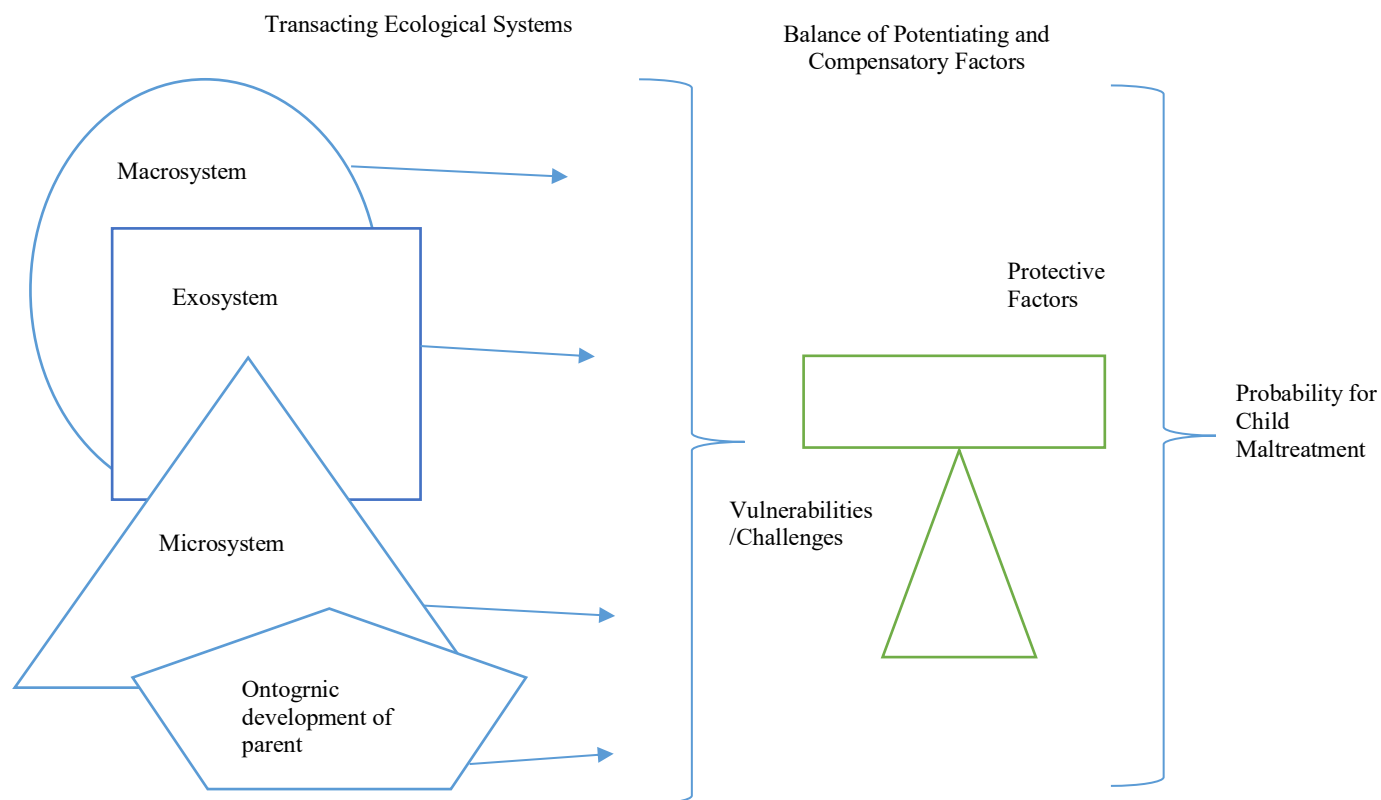
characteristics/ontogenic development); family level - premature infant, passivity of infant, decreased family interaction, role reversal, troublesome infant, large family (the microsystem); community level with unemployment, decreased job satisfaction, absence of support systems (isolation) (the exosystem), and in the broader culture (a highly violent culture, corporal punishment as a sanctioned belief etc.) (the macrosystem) (Hamilton, Stiles, Melowsky, & Beal, 1987).

An Ecological-Transactional Model

Based on Sameroff and Chandler (1975), Cicchetti and Rizley (1981) advanced the model by adding reciprocal interactions with an environment and proposed a transactional model. They added the concepts of compensatory factors (decreasing the risks for maltreatment to risk factors (increasing the risks for maltreatment) (Cicchetti and Rizley, 1981). Specifically, they conceptualized the risk of child maltreatment as probabilistic and identified four classes of determinants: enduring vulnerability factors; transient challengers; enduring protective factors and transient buffers. The likelihood of maltreatment is determined based on the balance of risk and protective factors and process (Cicchetti, Carlson & Dante, 1989). Even though this model emphasizes the balances between risk and protective factors, the model did not provide any specifics about which factors were more important (Azar, 1991)

Building upon this foundation, Cicchetti and Lynch (1993), proposed their Ecological-Transactional model (Figure 3.1.) that provided a more comprehensive, but still a general model for the etiology of child maltreatment. Thus, Azar's (1991) critique on their previous model remains valid. Further, despite the number of levels in the model, most of the research focused on the individual and family levels.

Figure 1 *An ecological-transactional Model for Child Maltreatment*



Cumulative Risk Model

In contrast with general ecological models, the cumulative risk model measures the total number of risk factors and suggests that the specific risk markers are not as important as the overall number of markers endorsed (Appleyard et al., 2005; Begle et al., 2010). The cumulative risk perspective implies that the total number of risk factors, independent of the presence or absence of particular risk factors, impacts outcomes (Appleyard et al., 2005; Evans et al., 2013; Rutter, 1979; Sameroff, 2000). This has been tested in numerous studies demonstrating a dose-response effect between number of adverse experiences including child maltreatment and children's health and wellbeing (Chapman et al., 2004; Felitti et al., 1998; Hahm, Lee, Ozonoff,

& Van Wert, 2010; Jonson-Reid, Kohl, & Drake, 2012; Lanier et al., 2018; Ramiro et al., 2010).

As the risk-factors can co-occur, this model investigates how specific risk markers function in the context of one another (Appleyard, Egeland, van Dulmen, & Sroufe, 2005). While comparing to a developmental-ecological model, Begle et al (2010) found that the developmental-ecological model, in which risk markers were organized into three separate conceptual domains (i.e., psychological-developmental, immediate, and broader), provided a poor fit to the data. However, examination of the cumulative risk model, which included the total number of risk markers, was significant in predicting child abuse potential, indicating that the accumulation of risk markers was more essential than which particular risk markers were endorsed.

Role of Poverty in Different Models

Poverty as a risk factor for maltreatment may exist in the family (micro-system), in the community (exosystem), or both. Evidence indicates that there is a great variation in how families and children respond to economic hardship (Conger & Conger, 2002). Different researchers who attempted to conceptualize poverty at a number of different levels, such as micro-individual family/household poverty and exosystem-neighborhood/community poverty have, explored the interactions through both direct and indirect mechanisms.

In the Family Stress Model (Conger et al., 1992), economic hardship increases economic and familial stress, ultimately leading to increased parental depression and marital conflict which influences harsh and ineffective parenting (Cadzow, Armstrong and Fraser, 1999; Conrad-Hiebner, 2015; Eamon, 2001; Newland et al., 2013; Yang, 2015; Yeung, Linver & Brooks-Gunn, 2002). Depression is widely recognized to be associated with ineffective parenting (such as low nurturance and harsh/inconsistent discipline) (Cadzow, Armstrong and Fraser, 1999;

Conrad-Hiebner, 2015; Eamon, 2001; Newland et al., 2013; Yang, 2015; Yeung et al., 2002) and specifically child neglect (Lee, Taylor, & Bellamy, 2012; Shepherd, 2012). Shook (1999) also proposed a framework based on psychosocial theories of economic hardship and parenting to show effects of income loss on the home environment, and the effects of multiple stressful events on parental wellbeing.

Conger et al (1990; 1992; 1993; 2002) also showed how financial hardship can place immense strain on parental relationships, increasing the risk of interparental conflict, violence, and separation. Recent studies also demonstrate that economic hardship is strongly related to ACE scores and this was mediated via poor maternal well-being (Liming, 2018). Poverty was found to be strongly related to both individual adversities, particularly parental separation, sexual abuse, and maternal mental health problems (Lacey et al, 2020).

Social isolation is thought to diminish parenting capacity due to lack of formal or informal supports that would help alleviate stress or support positive parenting or both (Coohey, 1996). However, research shows that social isolation and lack of support make families in poverty difficult to reach and serve, but early research suggested this could be due to the families' lack of trust of persons outside the family (DiLeonardi, 1993). Also, considering the fact that low-income families tend to have fewer social ties, especially when complicated by the presence of domestic violence, they are less able to have access to resources influencing their risk of child maltreatment (Cox, Kotch & Everson, 2003). On the other hand, researchers have pointed out that the presence or absence of supports may be different than perception of whether those persons are helpful (Coohey, 1996). Further, there is evidence that formal supports may play an equally important role (Maguire-Jack & Negash, 2016). The families with access to more

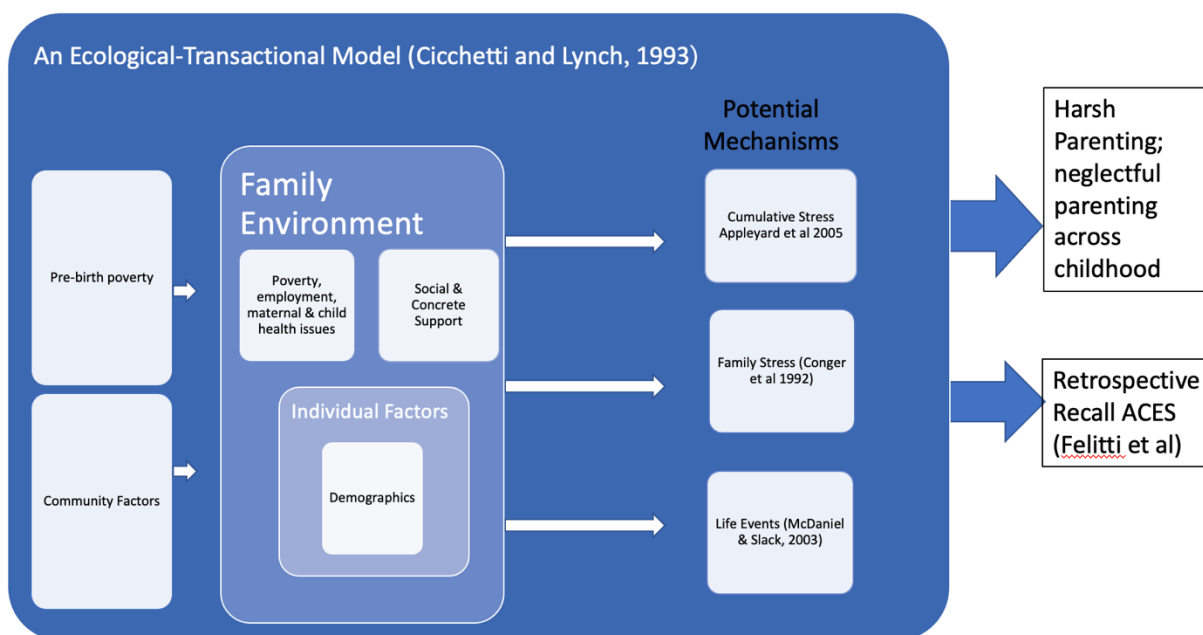
social services in their neighborhoods might be at less risk of child maltreatment (Ben-Arieh, 2010; Freistler, 2013; Maguire-Jack & Klein, 2015; Maguire-Jack & Negash, 2016; Morton, 2013; Negash and Maguire-Jack, 2015). Unfortunately, very low-income neighborhoods may have fewer services available (Maguire-Jack & Klein, 2015). The importance of formal supports (public child welfare services) is also evidenced in some programs designed to increase services' access (McCrosky et al., 2012).

Another approach used to explain possible pathways between poverty and child maltreatment was proposed by McDaniel and Slack (2005). Their Life Events Perspective explains the pathways between major life events and child welfare investigation for low-income caregivers. According to this perspective, major life events may contribute to material hardship and parenting stress in families thus making them more visible to CPS. Empirical research, however, does not support a substantial impact of visibility bias in CPS involvement (Drake & Zuravin, 1998; Kim, Drake & Jonson-Reid, 2018; Drake, Jonson-Reid & Kim, 2017; Rostad et al., 2006).

The proposed Model

Even with different assumptions on the interactive processes, perceptions, stresses, and social supports in the family environment, all models reviewed include assumptions that individual characteristics of the child and/or parent/household are not sufficient to explain the occurrence and nature of child maltreatment (NRC, 2014). Thus, this dissertation draws on a number of prior frameworks and combines aspects of theories to construct the following model. (Figure 2).

Figure 2 *Conceptualized model*



Built on Cicchetti & Toth's ecological-transactional model of child maltreatment, this dissertation integrates concepts taken from family stress, cumulative risk, and life event models to explore the impact of poverty (measured at prenatal and post-birth periods), neighborhood factors, and other positive or stressful aspects of the family environment (social support, employment, family structure, maternal and child health) on proxies for child maltreatment (harsh and neglectful parenting) as well as retrospective recall of adverse childhood experiences (ACEs).

Conclusion

While all models reviewed in this chapter include assumptions that various factors at different level could interplay and contribute to the occurrence and nature of child maltreatment, they do not in isolation explain the comorbid nature of poverty with different risk factors for child maltreatment.

Two primary mechanisms appear to emerge from the theoretical literature: 1) poverty creates stress that leads to maltreatment; 2) poverty creates social and/or resource isolation that leads to maltreatment. The stress models suggests that poverty reduces parent well-being that then reduces the ability to parent. Depression has been suggested as a result of stress and poverty. While depression and other mental health disorders have been found to be higher in CPS samples, we have little prospective research to support a causal link (Jonson-Reid et al., 2020). For example, many studies examining the link between depression and/or stress are limited to all low-income samples (e.g., Barnhart & Maguire-Jack, 2016) so it is difficult to assess whether poverty led to the condition that is linked to maltreatment. Nor is it clear why some individuals may experience stress and/or depression due to poverty at levels that impair parenting while others do not. The reduced availability of formal social supports model makes intuitive sense, but research is just emerging on the effect of increasing services in low resource communities (McCroskey et al., 2012). The present dissertation attempts to tease out more direct effects of poverty controlling for additional comorbid or contributing factors.

Chapter 4: Methods

This study aimed to explore the prospective relationships between poverty dynamics, family environment, childhood maltreatment measures and adult recall of ACEs using nationally representative PSID data . Analyses are restricted to an online portal maintained by the Institute for Social Research and Survey Research Center at the University of Michigan. The present investigator attended a summer PSID Data User Training Workshop online (University of Michigan, Ann Arbor, 2020) to help with familiarization with data. The study received IRB approval through the Washington University Human Research Protection Office (IRB ID #: 202108171).

The data offer a large enough sample to provide for advanced statistical modelling of both the repeated measures of inadequate or harsh parenting (prospective proxies of maltreatment) and later retrospective recall of child maltreatment and other ACEs in adulthood. The data also allow for exploration of maltreatment drawing on ecological, singular and cumulative risks to predict proxy measures of maltreatment during childhood and then retrospective recall of maltreatment and other ACEs.

This study explored the following AIMS:

Aim 1: To explore how poverty throughout childhood is associated with proxy measures of child maltreatment prospectively as well as later recall of specific and cumulative ACEs as adults. The analysis will control for family demographics, child health and development and select protective factors (social and concrete support, employment and neighborhood structural factors and processes).

H 1.1: There will be time ordering as well as association between household poverty and measures of harsh or inadequate parenting as well as later ACEs.

H 1.2: Cumulative risks in childhood will predict higher number of ACEs recalled.

Aim 2: To understand if associations differ between poverty, parenting and control variables with regard to (1) ACEs indicative of maltreatment, (2) other ACEs or (3) no ACEs.

H.2.1. Some studies show that poverty could be more predictive of neglect than other forms of maltreatment (Drake & Pandey, 1996; Sedlack et al, 2010), but no other hypothesis is

offered as prior studies have not attempted to discriminate how poverty and childhood experiences are related to specific types of ACEs.

H.2.2: An improvement in economic situation will be associated with decreasing incidents of self-reported recall of child maltreatment and other ACEs.

Data Source, Variables and Analyses

To answer the research questions, the data from the main household PSID survey, Child Development Supplement (CDS I-III) and Childhood Retrospective Circumstances Study (CRCS) were utilized. Additionally, census data was imported from the American Community Survey to provide estimates of community level poverty by linking at the family zip code level. Because of the ten-year span of census data collection and the timing of the CDS waves, the 2000 Census data are used to best approximate conditions in early childhood. 1990 data predated the birth of some children and the final CDS wave predated the 2010 census data.

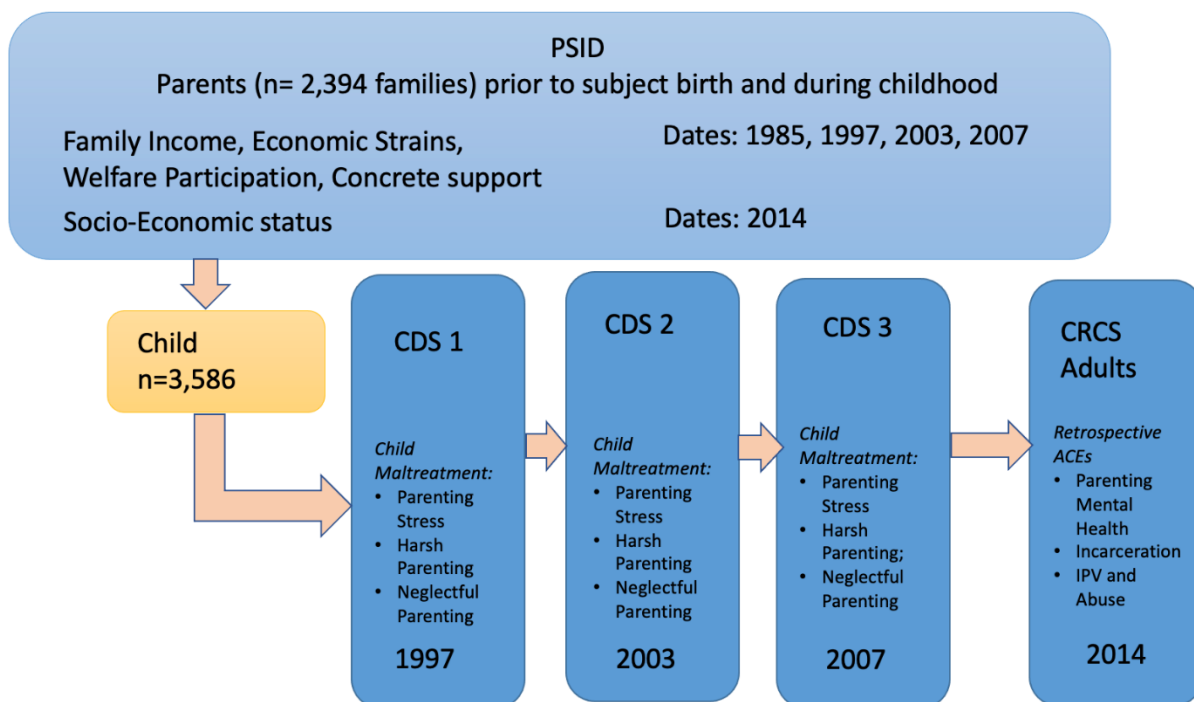
The PSID is a nationally representative household panel survey with over 50 years of data on the same families and their descendants. The PSID gathers data on the family as a whole and on individuals residing within the family, emphasizing the dynamic and interactive aspects of family economics, demography, and health. PSID data were collected annually from 1968-1997 and biennially after 1997. The original PSID sample of roughly 18,000 people in 5,000 households consisted of a nationally representative sample and an oversample of low-income families. PSID families are followed regardless of where they live. The sample grows naturally as children and grandchildren from these families form their own households and are invited to join the PSID (Beaule et al, 2021).

The Child Development Supplement (CDS) to the Panel Study of Income Dynamics (PSID) started in 1997 with the goal of providing researchers with a comprehensive, nationally representative, prospective database of young children and their families for studying the dynamic process of human capital formation. The data were intended to support models of how time, money and social capital at the family, neighborhood and school levels, as well as parental psychological resources and sibling characteristics, influence cognitive and behavioral development and health. Children and caregivers were re-interviewed 5 years and 10 years after the original interview (McGonagle & Sastry, 2015). The children in the cohort belonged to PSID families who completed the 1997 PSID interview and had at least one child under age 13 years in the household, although a small number of children were interviewed after their 12th birthdays. Up to two children were randomly chosen to participate in families with more than two eligible children. PSID has an oversample of low-income families and the PSID sample from which the CDS sample was drawn had a substantial number of African American and other racial and ethnic minority families. The CDS interviewed 2380 families, including 1085 White families, 992 African American families, 166 non-White, non-African American Hispanic families, 42 Asian families, 12 Native American families, and 77 families of Other race/ethnicity. There were a total of 3,563 children whose primary caregivers were interviewed.

The three CDS panels used in the present study were fielded at slightly different intervals. There were about 6 years between I and II but only about 4 years between II and III. Also, during data cleaning because of how dates were captured in regard to responses a few interviews were actually dated the year prior and a few responses were dated a year following the primary panel date. Interviews that fell out of this range were dropped from the analysis.

The Childhood Retrospective Circumstances Study (PSID-CRCS) is a supplement to the Panel Study of Income Dynamics (PSID). The goal of the study was to design and collect a mixed mode (web or paper) module from household heads and, if married/cohabitating, spouses/partners, about their childhood experiences. The data may be used to study early life influences on adult health and economic outcomes (McGonagle & Freedman, 2015). The initial PSID-CRCS sample consisted of 13,117 individuals aged 19 and older (aged 19 by January 1, 2013) who were household heads and spouses/partners in PSID families that participated in the 2013 wave of PSID. During editing, eligibility status was reviewed and confirmed for 12,985 cases. 8,072 cases provided responses with a response rate of 62%. The response rate was significantly lower for your respondents (McGonagle & Freedman, 2015).

Figure 3 *Sample Design*



While retrospective self-reported measures of childhood adversity might be a subject of possible misclassification and biases (Hardt & Rutter, 2004; Reuben et al, 2016), they still could be informative along with prospective measures that are limited to underreporting by caregivers or under-detection by agencies (Hardt & Rutter, 2004). In addition, the detailed economic information available in the PSID provides opportunities to measure poverty in a variety of ways as well as change in economic circumstance over time.

Sample. The sample frame for this study included children from the CDS I-III originating in 1997 (n=3,563) and their caregivers who were tracked through PSID household survey from before birth through the subjects' childhoods. Both these children who were old enough in 2014 and some of their caregivers (not included in the present study) were respondents in the 2014 CRCS study which included self-report of ACEs. Thus, this study links (A) family level data from the PSID to children included in the CDS for repeated measures analyses of poverty and child-rearing; and (B) child level data from the CDS to the CRCS to examine how prospective measures of maltreatment relate to the retrospective recall of ACEs.

Children who were part of the CDS I ranged in age from newborns to 12 years of age. Obviously older children did not have the ability to participate in all three waves of the CDS. Therefore, analyses of prospective measures of harsh and neglectful parenting were restricted to children aged 0 to 6 years at the time of the CDS I (n=1,685). Childhood analyses were further limited to cases that indicated the mother as the primary caregiver. This was the most frequent caregiver across waves and the source of birth information. This left a remaining prospective sample of 1,628.

Children who later participated in the retrospective recall ACEs study in 2014 included all ages. Analyses of later ACEs include all ages of children across the CDS waves (n=3,586 frame) -though not all of these children were of sufficient age or retained in the study long enough to participate in the 2014 survey. Therefore, basic descriptive analyses are presented in the results for both the restricted age frame at CDS I and the full CDS I sample. The additional subgroup analysis will be conducted with the subsample of CDS I-III children who also completed CRCS in 2014 (n=660). Even though 2,328 children (65%) were 19 and older in 2013, only 1,207 were heads, and spouses/partners in PSID families who participated in the 2013 wave of PSID, so the estimated response rate for this subsample was 54%, a lower response rate than the average response rate for CRCS – 62% (McGonagle & Freedman, 2015).

Measures

Dependent variables

Proxy Measure of Child Maltreatment behavior:

Prospectively, proxy for maltreatment experiences will be assessed by the HOME environment and Home observation for Measurement of the Environment (Home Scale, Caldwell & Bradley, 1984) from the CDS survey. The HOME Scale is used as a measure of the cognitive stimulation and emotional support parents provide to children and have measures for physical affection and physical abuse.

Specifically, prospective measures for neglectful parenting are operationalized prospectively using data from CDS (Section S: Family environment and HOME scale) and

retrospectively - CRCS (Section J: Relationship Quality with Parents/Guardians). The Home Observation for Measurement of the Environment (HOME Scale) is a short form from the Caldwell and Bradley HOME Inventory (Caldwell & Bradley, 1984) that can be used as a measure of the cognitive stimulation and emotional support parents provide to children. The particular items used in the PSID Child Development Supplement were taken directly from the National Longitudinal Survey of Youth, Mother- Child Supplement so that the scales would be as similar as possible (Baker, Keck, Mott & Quinlan, 1993). This scale comprises a large number of items in sections B-F and L of the primary caregiver/child questionnaire, and a few items in the primary caregiver/household questionnaire (Q2A26- Q2A28).

The HOME scale also contains items that measure physical affection, hostility and warmth. The questions used for physical abuse in the PSID CDS contain a large number of items in sections B-F depending on different age groups of children (under 3, 3-6; 6-9 and 10-12): for instance: B12: In general, how much trouble has your child been to bring up? Would you say, none, just a little, quite a bit, or a lot?; B13. Have you ever spanked (CHILD)?; D.6. Most children get angry at their parents from time to time. If (CHILD) got so angry that (he/she) hit you, what would you do?; E9. E9. Sometimes kids mind pretty well and sometimes they don't. Sometimes they do things that make you feel good and sometimes they don't. How many times in the past week have you... grounded, spanked, shown physical affection, etc...; E11: E11. Most children get so angry at their parents that they say things like "I hate you" or swear in a temper tantrum. Please look at this list and tell me which actions you would take if this happened: grounded, spanked, shown physical affection, etc...; and L of the primary caregiver/child questionnaire, and a few items in the primary caregiver/household questionnaire (Q2A26- Q2A28).

As the different types of child maltreatment behaviors often co-occur (Boxer & Terranova 2008; Claussen & Crittenden, 1991; Higgins & McCabe, 2001; Jonson-Reid et al., 2003; Kim, Mennen & Trickett, 2017), the total score of HOME scale is often used as a proxy measure for overall negative parenting. Given the focus on understanding child maltreatment in the present study, the interest was understanding problematic parenting. Similar to Berger (2004), a dummy variable was created that identified the lowest 10th percentile of scores on the HOME scale (Berger, 2004) to be used as a dependent variable. Also, taking into account, the importance of regular medical check-ups for early child development for children under 6 years old, a lack of medical check-up was added as another dependent variable. No medical check-up was also used in a prior study (Berger, 2004) and is available at all three waves.

While some argue that any corporal punishment could be considered maltreatment, this is more typical recently than might have been in the late 1990s. Indeed the majority of caregivers endorsed spanking at some point. Instead, some effort was made to try and identify a cutoff that would be more commonly accepted as indicative of problematic parenting. Lee et al (2014) investigated parental spanking of 1 year old children and found significant predictive association with a report to child protective services. While the question was asked at all three waves, it was decided to limit the analysis to CDS-I reducing the risk of issues of retrospective recall and problems with the introduction of new caregivers in the family.

Retrospective ACEs:

Because the measures of prospective maltreatment are proxies rather than direct measures of maltreatment, the ACEs retrospective recall is used to further explore how poverty is associated with maltreatment. Children participating as adults in the 2014 survey provided self-

report of ACEs in two sections of the survey. ACEs will be operationalized through Section H: (Parent/Guardian Mental Health) and Section J (Relationship Quality with Parents/Guardians).

Mothers' mental health and substance abuse: Questions ask whether during the respondent's childhood, their parents had three of the most prevalent mental health conditions: anxiety, substance use, or depression that lasted for two weeks or more. Information was collected on the occurrence and frequency of each condition, as well as whether professional treatment or hospitalization was obtained, and the extent the condition interfered with daily activities (Kessler, 1990-1992).

Parent/child interaction: Section J assesses the quality of relationship between the respondent and each parent during the respondent's childhood using questions adapted from the National Survey of Midlife Development in the U.S. Study (MIDUS I). Information was collected on the overall quality of communication, extent of being able to confide problems and worries, levels of understanding, tension, emotional closeness, love and affection, strictness, and effort put forth in parenting.

IPV and Abuse: A series of questions adopted from the Conflict Tactics Scales (Straus, 1979) assesses the frequency of conflict between parents and respondent, between siblings and respondent, and between the parents. Specifically, in addition to emotional warmth, emotional abuse could be measured by the combination of the respondent rating their relationship as poor with their mother and/or father and indicating that the relationship involved the highest degree of emotional tension. Physical abuse is measured by reporting if the mother and/or father sometimes or often slapped the respondent, threw things at him/her, or otherwise physically harmed the respondent (Schickedanz et al, 2018).

Independent Variables

Poverty

Poverty was measured at birth based on the household PSID date and across CDS waves through self-report measures as well as through census data linked to family zip code. Because of the ten year span of census data collection and the timing of the CDS waves, the 2000 Census data are used to best approximate conditions in early childhood. 1990 data predated the birth of some children and the final CDS wave predated the 2010 census data. See Table 1 for various explanations of income and material hardship measures. Various means of modelling poverty and resources include looking at financial and material hardship (Brooks-Gunn, Schneider & Waldfogel, 2013; Berger & Brooks-Gunn, 2005; Cox, Kotch & Everson, 2003; Crouch et al, 2019; Doidge et al, 2017; Marcal, 2018; Slak et al, 2004; Soares et al, 2016; Yang, 2015), SES status (Lacey et al, 2020; Liming, 2018; Metzler et al., 2017; Steele et al., 2016; Walsh et al., 2019), Employment (Conrad-Hiebner & Byram, 2018; Courtney, Dworsky, Pilavin & Zinn, 2005; Frioux et al, 2014; Slack et al, 2017), Welfare participation (Beimers and Counton, 2011; Brown et al, 1998; Cancian, Yang & Slack, 2013; Conrad-Hiebner and Paschall, 2017; Dubowitz et al, 2011; Mersky et al, 2009; Ovwigho, Leavitt & Born, 2003), Cash assistance (Beimers & Counton, 2011; Berger et al, 2017; Ovwigho, Leavitt & Born, 2003). Following data cleaning and univariate exploration the following measures were chosen:

Prospectively: Household's economic measures will be operationalized using the main PSID survey's sections T-2 Income and Transfers and Consumption and Expenditures and CRCS's section C (Socioeconomic Status). Measures include income and government transfers over time.

Family Income questions explore income from all sources (R23. What was the total income from all sources (for you and your family living there)?, Also, the ratio of the total family income over the CENSUS federal needs was available taking into account the composition of the family defining the income ratio to federal poverty threshold. Based on the continuous variable, the categorical and dummy variables were created coded at 50%, 100%, 150% and 200+% federal poverty threshold in that particular year. The data have been collected annually until 1997 and then bi-annually since 1999. Based on the year of birth of child, a separate variable was created for the birth year in addition to the variables to 1997, 1999, 2002, 2007.

Social Support: The measures of social support, A15-A19, were drawn from the National Survey of Families and Households and from the 1980 Panel Study of Income Dynamics. This set of items measures receipt of and provision of assistance to others who are not living with the respondent over the past month. Assistance includes time help, moral and emotional support, and help in an emergency. Also, concrete support received from community: R75. What about help from anyone else, such as a church, family, or a community group. Did you (or anyone in your household) receive help with any of the following from such groups because your income was too low: a. Transportation; b. Housing; c. Child Care; d. Health Care (not including Medicaid); e. Finding a job or getting job training; f. Food or meals (not including Food Stamps); g. Clothing; h. Paying other expenses. R76. Was that help from a church, family, community group, or what?

Economic Strain/hardship. The set of items (A53) is drawn from the work of Glen Elder and Rand Conger in measuring experiences of economic or financial stress and strain and practical responses to such financial pressures (Conger & Elder, 1994).

Controls

Demographic variables: Demographic variables included family structure, mothers age at birth of child, child sex and race/ethnic identification, and track level census demographics. Other measures of caregiver functioning, family conflict and child health status were used as proxies for additional risks for poor parenting and ACES across study waves. The general health question (A34) is the following: "In general, would you say (child's) health is excellent, very good, good, fair, or poor?" The question has a long history in surveys and is the one question that almost all PSID surveys include. See Table 1 for variable descriptions and wave of study (as applicable).

Table 1
Variable Definition and Derivation for PSID Sources

	Definition	Source				
		Prior/At Birth (1990-1997)	CDS I	CDS II	CDS III	2014 Retro
AIM 1 DV Infant Spanking	Primary Caregiver Report: age at first spanking – coded 1 if age 1 or younger		X			
AIM 1 DV HOME Score ¹	1 if Cutoff Lowest 10 th Decile of Primary Caregiver Report HOME :Proxy measure of Maltreatment (Harsh or Neglectful Parenting)		HOME Scale (0- 5)	Home Scale (6-9)	Home Scale 10+	
AIM 1 DV No Medical Care	Primary Caregiver Report: Within past 12 months 0/1		X	X	X	
AIM 1 and 2 ACES	Child (after age 18) Retrospective recall of ACES in childhood Type and count					X
IV Poverty Indicators	TTL HH Income Income to need based on Census for Fed Poverty Level – continuous and dummy coded at 50%, 100%, 150% and 200+% poverty	X X	X X	X X	X X	X

	Family transfer income	X	X	X	X
	Welfare Programs at birth (WIC, Medicaid, Food Stamps, AFDC)	X			
Economic Strain	Coded as 1=no econ hardship reported in last 12 months		X	X	X
Emot Support ³	Received in past month coded 1=if any yes		X		
Concrete ³ Support	Received in past month coded 1=if any yes		X		
Social Support	Satisfaction scale			X	X
Family Conflict	1=if responded that there was yelling/phys violence		X	X	X
Child Overall Health	Likert cutoff at poor		X	X	X
Perception of Neighborhood	Satisfaction Safety Moved for sake of child Length of residence		X	X	X
Zip code measures	Population ttl; Med HH income, % Dropout, race/ethnic pop		2000 Census ²		
Child Demographics	Age, race/ethnic, sex, Birth order	X			
Family Characteristics	Mother age at birth, marital status, # children	X			

¹ HOME Scale questions vary by age of child so decile is used rather than continuous measure as totals are different. Lowest decile was chosen after Berger (2004).

² Census data were selected from 2000 as the best average representation of childhood environment

³ Receipt of support only asked in CDS I, later waves asked only about overall satisfaction with social support

Data Cleaning and Analysis

Analysis and data management were conducted in StataMP17. Data were linked according to child-level and family-level IDs across the main household, CDS and the CRCS data files over the years (1983-2007, 2014). As aforementioned, census information was linked according to household track and zip-codes. The PSID data permissions do not allow for downloading data or analyses outside of the system, so all work was done on the study's secure portal enclave. As up to two children were interviewed in some households, analyses take into account a clustering of the observations.

Analyses were conducted using both person-event and flat file data formats according to the particular analytic approach.

Aim 1: To explore how poverty throughout childhood is associated with proxy measures of child maltreatment prospectively as well as later recall of specific and cumulative ACEs as adults.

H.1.1.: Following exploration of the limitations of the CDS waves, the analyses for this hypothesis was originally going to be divided into two separate modelling approaches. To measure a child maltreatment risk using prospective measures, CM Risk dummy variable was created using a) the onset of spanking at age one has been found to predict later CPS involvement (Lee et al, 2014), b) no medical check-up in the previous year and c) lowest 10 percentile HOME score (after Berger, 2004). Considering that all caring behaviors are particularly key for very young children, it was decided to limit these analyses to children under age 6 at the time of the first survey. In addition to attempt to control for consistency over time, we limited children in families with mothers listed as the primary caregivers. Multilevel Logistic regression with mixed effects was employed to model children and caregivers clustered in the

families. This approach has the advantage to investigate the effects of covariates both on the overall level of the responses and on changes of the responses over time (Skrondal & Rabe-Hesketh, 2008). Model fit was assessed using C-statistics (Hosmer, 2000).

H.1.2. Next analyses of how childhood parenting factors and poverty predicted adult self-report of ACEs were done. Data from all children present in the CDS 1 were limited to those responding to the 2014 self-report survey as adults (n=660). Two approaches were used. First, a Mixed model approach was used to be able to include the repeated childhood measures and using study weights. Given that ACEs are more appropriately considered a count variable, a second model was constructed to see if childhood factors could predict the actual count of ACEs. A Negative binomial multilevel regression analysis was used to model self-report ACEs as a count variable (number of experiences) controlling for demographics, community variables and parental health during childhood (Liu & Cela, 2008).

Aim 2 analyses explored whether there were differing associations between poverty and other childhood parenting and developmental controls according to later recall of child maltreatment as compared to other ACEs or no ACEs. (n=660). Two approaches were used.

H.2.1. A latent class analysis approach was used to fit Finite Mixture Model to classify observations, to adjust for clustering, and to model unobserved heterogeneity by childhood poverty in relation of ACEs. (Lanza et al, 2007; Skrondal and Rabe-Hesketh (2004). Given the comorbid nature of many of these issues in childhood in prior research, identifying a typology of poverty that is more predictive of the ACEs outcome was thought to hold promise in informing translation to intervention. Childhood variables were entered as potential covariates according to developmental stage rather than using the person event format.

H.2.2: Multinomial logistic regression with mixed effects was used to model changes in economic circumstance (time varying) at the family level and retrospective report of no ACEs, maltreatment only, Other ACEs. Using a robust estimator allows for including community and family level controls (Allison, 2010).

Chapter 4: Results

As noted in the methods, the sample size differs according to the analyses. AIM 1 analyses of childhood proxies for harsh and neglectful parenting were limited to children under age 6 at the first wave with mothers reporting as the primary caregiver. In contrast, analyses of retrospective recall of ACEs from the 2014 wave includes all of the children in the CDS 1 who were old enough and agreed to participate in that survey. Table 2 (below) provides a descriptive comparison of the full CDS I sample, the sample restricted to young children, and the final retrospective sample.

Table 2 Descriptive Statistics of the sample (1997)

Year - 1997-2013	Full sample, n=3560 (1997)			Sample of children under 6 - 1,628 (1997)			Retrospective Sample of 660 (1997-2013)		
	n	mean %	SD	n	mean %	SD	n	mean %	SD
Descriptive Statistics									
Dependent variables									
Infant Spanking at age 1	822	23.07		480	29.48		147	22.27	
HOME Score ¹ (lowest 10 percentile)	359	10.08		299	18.37		23	3.48	
No Medical check up previous year	457	12.83		66	4.05		152	23.03	
CM Risk ever	1,714	48.11		879	53.99		305	46.21	
ACES (0-10)							660	2.23	1.94
IV									
Family income (1997)	3,563	44,446	44,386	1,628	41,649	41,639	660	52,523	51,734
By Federal Poverty Threshold at Birth									
Year									
<50% of FED POV	271	7.61		142	8.72		38	5.76	
50-100% FED POV	279	7.83		112	6.88		58	8.79	
100-150% FED POV	282	7.91		120	7.37		56	8.48	
150-200% FED POV	280	7.86		132	8.11		47	7.12	
200%+ FED POV	1,884	52.88		1122	68.92		374	56.67	
NO Economic Strain/hardship	635	17.82		232	14.25		135	20.45	
Concrete ³ Support	1,233	34.61		606	37.22		235	35.61	
Emotional Support ³	1,529	42.91		698	42.87		298	45.15	
Family Conflict	1,717	48.19		740	45.45		343	51.97	
Perception of Neighborhood (good)	1,834	51.47		817	50.18		316	47.88	
# Census tracks	1,408			862			462		
Child Demographics									
Age	3563 (0-13)	6.06	3.64	1628 (0-6)	2.68	1.49	660 (18-29)	25.24	2.48

Year - 1997-2013	Full sample, n=3560 (1997)			Sample of children under 6 - 1,628 (1997)			Retrospective Sample of 660 (1997-2013)		
Descriptive Statistics	n	mean %	SD	n	mean %	SD	n	mean %	SD
Race									
White	1642	46.08		771	47.36		381	57.73	
Black	1455	40.84		634	38.94		224	33.94	
Other	191	5.36		89	5.47		27	4.09	
Hispanic	267	7.49		131	8.05		27	4.09	
Sex: Female	1,748	49.06		765	48.22		408	61.82	
Child Overall Health - Poor	95	2.68		22	2.72		14	2.13	
Child with disability	173	4.84		45	2.74		44	5.00	
First child	1,392	40.73		698	44.23		231	36.44	
Health insurance Medicaid	793	22.26		415	25.49		607	91.97	
Mother's Characteristics									
Mother's age at birth	3,428	26.63	5.81	1,582	26.64	6.19	638	26.64	5.37
Mother's marital status at birth - married	2,146	60.23		953	58.54		454	68.79	
Total number of children	3,428	2.82	1.27	1,586	2.75	1.27	638	2.84	1.2

When comparing these three datasets, there were no statistical differences were observed except associated with different number of observations. Other than differences in age-specific variables which is to be expected, the sample restricted to younger children had a higher proportion of lower HOME percentiles but better access to health care. There were notable differences, however, between those who persisted in the study and responded to the 2014 survey and the original CDS I cohort. Overall the 2014 cohort had a higher mean income in early childhood (52,523 v 44,446), was more likely to be female (61.8 v 49.1%) and more likely to be White (57.7 v 46.1%). Adult respondents were also less likely to have been among those in the lowest decile for HOME scores.

AIM 1

AIM 1a: Childhood Proxy for Maltreatment: The first analysis sought to understand how various indicators of poverty, family characteristics, and neighborhood characteristics were associated with various proxy measures of maltreatment during childhood. Indicators of harsh and neglectful parenting were combined into a single measure of “ever maltreated” including, spanking at age 1, and repeated measures including the lowest decile of HOME scale, and no medical care in the past 12 months. Initially, it was hoped to model these separately but with wave attrition the model did not converge. Overall, over the years, 47.03% of caregivers (unweighted) reported CM risk behavior: specifically, 51.72% of caregivers in 1997, 44.04% in 2002, and 45.33 in 2007 reported CM risk behavior. Table 3 includes the results of the multilevel-level logistic regression with mixed effects.

Table 3 *Likelihood of Harsh or Neglectful Parenting Across Three Waves*

Prospective risk of CM	Odds ratio	Std. Err.	P	95% CI	
Log of Family Income	0.649	0.812	0.001	0.508	0.829
Welfare when pregnant	0.499	0.194	0.070	0.233	1.068
Child's age (birth-5yrs)	0.664	0.052	0.000	0.569	0.775
Child Race: ref White					
Black	3.464	2.517	0.087	0.834	14.393
Hispanic	1.112	1.053	0.911	0.174	7.116
Other	0.412	0.409	0.372	0.059	2.885
Child sex: female	0.551	0.121	0.007	0.359	0.846
Mother's age at birth	0.988	0.323	0.712	0.927	1.053
Mother married at birth	0.896	0.359	0.785	0.409	1.966
Family Conflict (yes/no)	1.565	0.015	0.030	1.045	2.344
Neighborhood social cohesion (0-16)	0.925	0.084	0.000	0.989	0.954
Census 2000 (Zip Code)					
Log Median Fam Income	0.095	0.840	0.008	0.017	0.538
HS dropout	0.968	0.235	0.186	0.923	1.016
Urban	0.981	0.006	0.002	0.969	0.993
% of Black	0.989	0.109	0.335	0.968	1.011
% of Asian	1.303	0.311	0.269	0.815	2.081
Cons	1.28E+15	1.28E+16	0.000	4373700	3.76E+23

Log Likelihood	-1678.054			
Wald chi2 (16)	99.14	p=0.000		
N	4,116			
Number of Groups	1,184			
LR test vs. Logistic Model:	chibar2 (01)	2085.6	p=0.0000	
<hr/>				
Random Effects				
Parameters	Estimate	Std. Err	95% CI	
<hr/>				
Family				
sd (cons)	6.245	0.428	5.460	7.144
<hr/>				

Log of Family income⁴ was significant at the family level (OR=.65) as well as at the zip code level (OR=.095) - both indicating that higher levels reduced the likelihood of any form of harsh or neglectful parenting in childhood. Indication of poverty at birth (welfare while pregnant) was not significant when controlling for more proximal measures of socioeconomic status. Mothers of females were less likely to report harsh or neglectful parenting (OR=.55). At wave 1, children were ages birth through 5 years, and for each year in age, the risk of poor parenting went down (OR=.66). Children in homes with high levels of family conflict (yes/no) were more likely to be among those subject to harsh or neglectful parenting (OR=1.56). Higher levels of neighborhood social cohesion reduced the likelihood of harsh or neglectful parenting by about .08 per unit increase.

AIM 1b ACEs: The remaining models focused on the 660 individuals that responded to the 2014 survey and were also present in the CDS panels. Descriptive statistics by type of ACE and number can be found in Table 4a.

⁴ For easy interpretation of the estimates, the income was lg transformed: by dividing the coefficient by 100, we can see that 1% increase in the independent variable (income) decreases the odds for CM risk behavior by (0.649/100) units.

Table 4a *Retrospective ACEs from the 2014 Survey*

ACEs:	n	Total (%)
Physical abuse	336	50.91
Neglect (physical)	49	7.42
Neglect (emotional)	192	30.24
Emotional abuse	115	18.14
Victim of violent crime including sexual abuse	25	3.87
Mom's substance abuse problem	61	9.24
Mom's MH problems	133	20.37
Domestic violence (physical)	122	18.48
Parents divorced	118	18.13
Financial struggle	319	48.33
Number of ACEs (10)		0.00
0	133	20.15
1	161	24.39
2	126	19.09
3	74	11.21
4+	166	25.15
Mean ACE score (SD)	2.23 (1.94)	

Most of the sample reported having experienced at least one ACE in their childhood with a mean of slightly over two. The two most frequently endorsed ACEs were physical abuse (50.9%) and financial struggles (48.3%). Neglect was third highest at about 38% if you sum both physical and emotional neglect.

It is also worth mentioning that all correlation coefficients were statistically significant at 0.05 level (Table 4b)

Table 4b *Correlation between various ACEs*

	Physical abuse	Neglect (physical)	Neglect (emot)	Emot abuse	Victim of violent crime	Mom's substance abuse	Mom's mental health	Domestic violence	Parents divorced	Financial struggle
Physical abuse	1.000									
Neglect (physical)	0.102*	1.000*								
Neglect (emotional)	0.202*	0.382*	1.000							
Emotional abuse	0.203*	0.385*	0.563*	1.000						
Victim of violent crime	0.068	0.097*	0.067	0.101*	1.000					
Mom's substance abuse	0.155*	0.273*	0.214*	0.194*	0.046	1.000				
Mom's Mental health	0.191*	0.230*	0.212*	0.183*	0.118*	0.192*	1.000			
Domestic violence	0.343*	0.115*	0.160*	0.649	0.090*	0.184*	0.189*	1.000		
Parents divorced	0.056	0.125*	0.094*	0.064	0.051	0.118*	0.137*	0.291*	1.000	
Financial struggle	0.180*	0.121*	0.211*	0.158*	0.110*	0.988*	0.217*	0.219*	0.1059*	1.000

*statistically significant at <0.001

AIM 1b: Self-report of ACEs Analyses of self-report of ACEs was modelled in two ways. The first model with continuous ACEs score was tested with weights and without weights (not shown here as there were no differences in the results). The model used a Mixed Regression approach to take into account repeated measures of childhood poverty (Table 5). In the model, the interaction term of the dummy variable of time and CM risk behavior was included to allow the coefficient on (effect of) CM risk to vary across periods. The second (Table 6) used the count variable without weighting using birth and baseline controls onl

Table 5 *Childhood poverty and Retrospective ACEs (using weights)*

ACES	Coefficient	Std Err	P	95% CI
Year				
2002	0.029	0.000	0.000	0.289 0.297
2007	0.146	0.001	0.000	0.136 0.156
CM Risk Ever	0.157	0.001	0.000	0.155 0.158
Year ## CM Risk Ever				
2002	-0.030	0.000	0.000	-0.030 -0.029
2007	0.007	0.006	0.000	0.006 0.010
Below Fed Poverty Birth year	0.560	0.001	0.000	0.558 0.563
Below Fed Poverty over the years	-0.024	0.000	0.000	-0.025 -0.024
Received Welfare when pregnant	-1.476	0.001	0.000	-1.479 -1.473
Received concrete support	-1.670	0.338	0.621	-0.830 0.496

ACES	Coefficient	Std Err	P	95% CI	ACES
Child Race: ref White					
Black	-0.854	0.564	0.130	-0.960	0.252
Hispanic	-2.401	1.179	0.042	-4.711	-0.911
Other	-1.544	0.861	0.073	-3.231	0.144
Child sex: Female	0.369	0.001	0.000	0.368	0.370
Child's health rated by PCG	0.050	0.000	0.000	0.050	0.050
Mother's age at birth	-0.005	0.000	0.000	-0.006	-0.005
Mother married at birth	0.308	0.001	0.000	0.305	0.310
Living in poor neighborhood	0.005	0.000	0.000	0.004	0.005
Census 2000					
Ln Median Family Income	-7.398	0.195	0.000	-7.779	-7.016
% of Black	-0.039	0.009	0.000	-0.056	-0.219
% of Hispanic	-0.010	0.015	0.518	-0.039	0.020
% of American Indian	0.219	0.061	0.000	0.100	0.338
% of Asian	0.088	0.038	0.021	0.013	0.163
Const	82.292	2.239	0.000	77.903	86.681

Log Likelihood	-1492295.9
Obs	15,410,390
Number of Groups	360
Wald chi2 (22)	3.39e +06
AIC	2300927
BIC	2301276

Random Effect

Random Effect	Estimate	Str.Err	95 CI
Family Id: identity			
Var (_cons)	9.372	0.699	8.098 10.847
Var (Residual)	0.710	0.000	0.071 0.711

In the Mixed Regression model, indicator of family poverty at birth was associated with an increase in the number of ACEs reported while receipt of welfare during pregnancy was associated with a decreased likelihood of self-reporting childhood ACEs. However, more recent measures of poverty (CDS II or III) appeared to moderate the impact of early poverty. Indicator of child maltreatment (proxy used in childhood model) was associated with a higher likelihood of reporting ACEs as an adult. Neighborhood social cohesion was not significant but a caregiver's prior report that they lived in a poor neighborhood was- though the direction was unexpected. Adults who had lived in higher proportion Black neighborhoods were less likely to

report ACES but the opposite was true for zip codes with higher proportion Asian or American Indian. Females were more likely to self-report ACES as were adults whose mothers had rated them in poor health as a child.

Table 6 Negative Binominal Analysis of Count of ACEs

ACES	IRR	Std. Err	P	95% CI	
Below Fed Pov Birth year	0.962	0.144	0.795	0.717	1.291
Welfare when pregnant concrete support	1.164	0.144	0.225	0.911	1.489
Child Race: ref White					
Black	0.744	0.136	0.105	0.520	1.064
Hispanic	0.839	0.282	0.602	0.434	1.622
Other	0.793	0.203	0.364	0.480	1.309
Child sex: female	1.047	0.103	0.645	0.863	1.270
Child health rated by PCG	1.062	0.045	0.151	0.978	1.154
Mother's age at birth	0.977	0.010	0.018	0.959	0.996
Mother married at birth	0.775	0.099	0.046	0.603	0.996
Living in poor neighborhood (perceived)	1.054	0.093	0.555	0.886	1.254
Census 2000					
Ln Median Fam Income	1.120	0.173	0.464	0.827	1.517
% of Black	1.000	0.003	0.878	0.995	1.006
% of Hispanic	1.002	0.004	0.579	0.994	1.011
% of American Indian	1.023	0.018	0.198	0.988	1.058
% of Asian	1.017	0.011	0.144	0.994	1.039
Year	1.003	0.008	0.699	0.988	1.019
Const	44134.560	7298212.000	0.948	7.7E-137	2.50E+145
In_r	16.995	164.611		-305.637	339.627
In_s	0.505	0.112		0.284	0.725
r	2.40E+07	3.96E+09		1.8E-133	3.10E+147
s	1.657	0.186		1.329	2.065
Log Likelihood	-1369.0377				
Wald chi2 (17)	30.95	p=0.0202			
N	825				
Number of Groups	401				
LR test vs. pooled:	chibar2(1)=	313.26			

Next self-reported ACES was modeled as a count variable using only Wave I controls to see if any predictors had a relationship with the increase in count. Prior receipt of formal services was associated with a decreased number of ACES as was having a mother that was older at birth or married. Neither the poverty variables or prior caregiver report indicating childhood harsh or neglectful parenting distinguished between the number of ACEs reported.

AIM 2

The second study aim focused on understanding how childhood poverty, family characteristics, and neighborhood might help to understand who report and what are the types of ACE reported in adulthood. Table 7 and 8 illustrate the results of a Latent Class Analysis, specifically Finite mixture model to try to identify the individuals with self-reported ACEs were clustered together according to their poverty measures. A three-class model was the best fit for the data. ($N=1,980$, $II(\text{model})=-3.893$, $df(21)$ $AIC=7829.003$, $BIC=7946.411$). As illustrated in Table 7, class 1 was comprised of individuals who reported an average of 1.1 ACE (marginal probability =.65); Class 2 included those with over 4 ACES (marginal probability =.18); and Class three averaged about 3 ACEs (marginal probability=.17).

Table 7 *Poverty Predictors Classes for ACEs*

	Class 1 (Low ACEs)	Class 2 (Medium-High ACEs)	Class 3 (Very High ACEs)
Probability of the Class	0.649	0.16.7	0.184
Marginal Means (ACEs)	1.129	3.978	4.619
Poverty at Birth	-.150	.455	-.823*
Welfare during Pregnancy	.350*	2.67*	-1.07*
Poverty During Childhood	-.092	-.439	-.291
Economic Hardship	-.276*	-1.32*	-.534*
Neighborhood Poverty	-.069	-.101	.145

* statistically significant

Receipt of welfare programming during pregnancy was positively associated with an increase in the likelihood of being in Class 1 (Low ACEs) and 2 (Medium-High(but a decrease for Class 3 (Very High ACEs). Poverty at birth was significantly associated with a decrease in the likelihood of Very High ACEs Class. Economic hardship was negative and significantly associated with all three classes but had the strongest effect for Class of Medium Hardship ACEs. Tests of invariance were run, and classes did not vary by race or by type of reported ACEs.

To test, how changes in economic situation (over time) are associated with decreasing adverse outcomes, multinomial logistic regression with mixed effects was used to model changes in economic circumstances (time varying) at the family level and retrospective report of no ACEs, maltreatment only, Other ACEs. Table 8 Multi-level logistic regression of report of maltreatment or other ACE compared to no ACEs and CM compared to Other ACEs. Overall, the model suggested that there are few childhood factors available that differentiate between the specific forms of ACEs reported compared to none. None of the census variables were predictive and were ultimately dropped from the final model given the relatively modest sample size. Specifically, when compared to adults that reported no past ACEs, those that reported only

maltreatment only the respondents' history of being reported as in poor health by their mother differed with a relative risk of 1.55. Mother's age at birth was nearly significant ($p=.050$).

Table 8 Results of Multinomial Logistic Regression

ACES	RRR	Robust Std. Err	P	95% CI	
No ACES	Base Outcome				
CM related ACEs					
Year					
2002	0.988	0.107	0.908	0.798	1.221
2007	1.582	0.717	0.908	0.651	3.845
ln Family Income	1.177	0.256	0.455	0.768	1.803
Economic hardship	1.024	0.256	0.455	0.768	1.803
Welfare when pregnant	1.740	0.844	0.254	0.672	4.502
Child Race: ref White					
Black	1.003	0.427	0.995	0.434	2.312
Hispanic	0.686	0.751	0.731	0.802	5.867
Other	4.374	5.562	0.246	0.362	52.873
Child sex: female	0.505	0.196	0.079	0.236	1.082
Child's Health	1.546	0.284	0.017	1.079	2.215
Mother's age at birth	0.936	0.032	0.054	0.875	1.001
Mother married at birth	1.588	0.718	0.306	0.655	3.850
Total number of children	1.087	0.177	0.608	0.790	1.497
Concrete support	1.068	0.420	0.868	0.494	2.306
Emotional support	0.798	0.332	0.587	0.354	1.801
Family Conflicts	1.373	0.427	0.308	0.746	2.525
Const	0.661	1.745	0.875	0.004	116.873
ACEs not related to CM					
Year					
2002	1.053	0.242	0.298	0.834	1.808
2007	0.381	0.950	0.000	0.234	0.621
ln Family Income	1.228	2.423	0.298	0.834	1.808
Economic hardship	0.381	0.945	0.000	0.234	0.621
Welfare when pregnant	1.841	0.787	0.153	0.797	4.256
Child Race: ref White					
Black	0.591	0.225	0.168	0.280	1.247
Hispanic	0.735	0.630	0.719	0.137	3.946
Other	6.907	7.426	0.072	0.840	56.813
Child sex: female	0.590	0.187	0.095	0.317	1.096
Child's Health	1.629	0.272	0.003	1.175	2.258
Mother's age at birth	0.928	0.288	0.016	0.873	0.986
Mother married at birth	1.264	0.508	0.560	0.575	2.776

Total number of children	1.129	0.164	0.404	0.850	1.499
Concrete support	0.605	0.198	0.124	0.319	1.148
Emotional support	1.223	0.454	0.587	0.591	2.531
Family Conflicts	1.990	0.518	0.008	1.195	3.313
Const	1.839	4.470	0.802	0.157	215.696

Log pseudoLikelihood	-683.459	
Wald chi2 (16)	79.090	p=0.000
N	819.000	
Number of Groups	361.000	

Random Effects				
Parameters	Estimate	Std. Err	95% CI	
Family sd (_cons)	6.245	0.428	5.460	7.144

There was a greater differentiation between those who reported non-maltreatment ACEs and no ACEs. Child health was again a more common problem for those who reported other ACEs compared to none. Mother's age at birth was significant with those with older mothers less likely to report other ACEs. Early economic hardship was less common among those reporting other ACEs. Family conflict in early childhood was much more common for the group reporting other ACEs which suggests some consistency across prior caregiver report and adult retrospective report given that other ACEs includes domestic violence and parental divorce.

Comparing those who reported CM compared to other ACEs revealed that those reporting CM were more likely to have had note of economic hardship in childhood (nearly 3 times higher). The receipt of some sort of formal services was nearly significant but no other variable was different.

Chapter 5: DISCUSSION

This study aimed to explore the potential causal nature and the magnitude of the relationships between different measures of poverty, CM and ACEs. Using the longitudinal data from the PSID study, the dissertation aimed to contribute to the field with additional evidence. Specifically, the study aimed to: 1) To explore how poverty throughout childhood is associated with proxy measures of child maltreatment prospectively as well as later recall of specific and cumulative ACEs as adults; and 2) To understand if associations differ between poverty, parenting and control variables with regard to (1) ACEs indicative of maltreatment, (2) other ACEs or (3) no ACEs.

For this aim one, several models were fit to explore a) time ordering as well as association between household poverty and measures of harsh or inadequate parenting as well as later ACEs and b) how the Cumulative risks in childhood would predict higher number of ACEs recalled.

The findings for the first AIM of this study are consistent with other study findings on an association between poverty and maltreatment, although the childhood measures in this study are better considered as a proxy measure. The results showed an importance of both family level and neighborhood socioeconomic resources in predicting a caregiver's self-reporting of harsh and neglectful parenting. In leu of the existing literature, the study confirmed that with increased ln of family income, the risk for proxy measures of child maltreatment is decreasing and the magnitude is important: (OR=.65). This finding once again highlines that even in small additional amount can make a difference (Ovwigbo, Leavitt & Born, 2003; Beimers & Counton, 2011; Cancian, Yang & Slack 2013; Berger et al., 2017).

In addition, the model showed that family income matters in the context of neighborhoods too. Measured by median family income at CENSUS tract level, higher median family income demonstrated a reduced likelihood of any form of harsh or neglectful parenting in childhood (OR=0.09). In the context of the neighborhood, the model showed the importance of social cohesion as well. The higher levels of perceived social cohesion were associated with a reduced likelihood of harsh or neglect previously (Cao & Maguire-Jack, 2016; Freisthler and Maguire-Jack, 2015; Maguire-Jack & Wang, 2016; Maguire-Jack & Showalter, 2016; Molnar et al., 2016; Ma, Grogan-Kaylor & Klein, 2018; McLeigh, McDonell, Lavenda, 2018). In this study, living in poor neighborhoods rated by caregiver, was also associated with later adult report of ACEs as well.

In addition, the context of locality, urbanity measured in percentages at track level, was associated with reduced likelihood for CM proxy measures. Previously, Dubowitz and his colleagues (2011) found that single mothers from urban areas had a higher relative risk for CPS involvement. In our case, for the prospective CM risk, age of mothers and their marital status were not significant for prospective CM risk behavior, however, these demographic variables were significant in case of later recall of ACEs. Also, mothers of females were less likely to report harsh or neglectful parenting (OR=.55) and for each year in age the risk of poor parenting went down (OR=.66). The national trends over the years also indicate that incident of child referrals to CP services are higher for younger children [US DHHS], 2022; 2021; 2020).

It is also important to notice that children in homes with high levels of family conflict were more likely to be among those subject to harsh or neglectful parenting (OR=1.56). Receipt of support through welfare programs during pregnancy was not quite significant in childhood but did reduce the likelihood of later self-report of ACEs among adults who

participated in the 2014 survey. The participation in welfare programs was considered as a controversial predictor for CM by some researchers. While some studies found that the CM risks are higher in the population who got assistance from public services (Mersky et al., 2009; Brown et al., 1998; Ovwigho, Leavitt & Born, 2003; Beimers and Counton, 2011), others argued that these association might be driven the higher needs of these families (Conrad-Hiebner & Paschall, 2017; Dubowitz et al., 2011). The previous studies showed importance of concrete support (Rostad, Rogers & Chaffin, 2017; Ryan and Schuerman, 2004; Loman and Siegel, 2012); however in this case, receiving concrete support from other family members, friends and relatives was not significant in either model.

AIM two focused on trying to understand if there were differences in self-report of certain forms of ACEs that might inform specific policy and program approaches for prevention. This was done using both a variable-based and person-based approach.

Using the person-approach, the finite mixture models showed that despite types of poverty measures, the probability to any class in relation to recall of ACEs was significant. However, this once again emphasizes the complexity of and multidimensionality of poverty measurements – depending on various outcome variables, poverty demonstrated various levels of significance.

The variable-based approach yielded few differences between the types of ACEs reported. Generally, those reporting CM appeared to experience more childhood economic hardships than those reporting other ACEs, and those reporting other ACEs were more likely to have had mothers who reported family conflicts in childhood. The devastating effect of family stress and family conflicts on parenting was demonstrated by numerous scholars (Cadzow, Armstrong and Fraser, 1999; Conrad-Hiebner, 2015; Eamon, 2001; Newland et al., 2013; Yang,

2015; Yeung, Linver & Brooks–Gunn, 2002). Conger et al (1990; 1992; 1993; 2002) also showed how financial hardship could place immense strain on parental relationships, increasing the risk of interparental conflict, violence, and separation.

The main difference between those who reported ACEs and those who did not - was a mother noting health issues in childhood. This may indicate that these children were already experiencing health or mental health issues in childhood that perhaps made the experiences more salient to report later. Research indicates that children with disabilities reported to CPS represent 25.9% of children with CPS reports and 29.0% of those with substantiated cases, even though they make up only 10.4% of total population (Maclean et al, 2017). Studies suggest that the subset of children and youth with intellectual and developmental disabilities specifically is 1.5-3 times more likely to be maltreated when compared with their peers (Fisher et al, 2019; Hibbard & Desch, 2007; Reese & Deutsch, 2020; Reiter, Bryen, & Shachar, 2007).

Limitations and Implications for Policy, Practice and Future research

While the Panel Study of Income Dynamics has strong measures of economic status over time, the measures of parenting were limited. There were no direct measures of child functioning available or official record of a report of alleged maltreatment. Generally, the sample was skewed toward lower income families which may have limited some of the discrimination strength by economic status.

The caregiver of children could change over time but it was difficult to track household changes and the most common respondent was the biological mother. Although changes in

family composition might have unique impacts on children, a larger sample with more diverse family types would have been required to include this in analyses.

The initial CDS had an overrepresentation of Black families compared to the population (40.8%) but not of other racial groups. For example, only 7.5% of the sample was identified as Hispanic. Once limited to young children and accounting for attrition over time, this made it unrealistic to break out analyses by racial/ethnic group or test interaction terms over time. While the main effect of child race/ethnicity was not significant, with a larger sample, there may have been opportunities to better assess variation.

Another difficulty was associated with the consistency of measures: several measures changed over the waves making it challenging tracking the change over the time. For instance, while social supports are considered important for parenting, the questions changed over time in the CDS surveys. At the first wave, caregivers were asked about what was received. Later waves asked about satisfaction with supports instead. Thus, supports were measured only at baseline.

To make full use of the three waves of data, it was necessary to limit the prospective childhood analyses to young children. While not a limitation per se, it did substantially reduce the sample size. This in turn, made it more difficult to add more nuanced or detailed measures of income, for example.

Not all participants in the CDS were old and independent enough (head of households) to participate in the Retrospective survey, but even so relatively few of the original cohort was represented. The adult respondents were more likely to have come from a higher SES childhood background and very few of those with very low childhood HOME surveys persisted. Still the self-reported prevalence of ACES in this sample was somewhat higher than nationally (nearly

80% compared to 60%) (Jones, Merrick & Houry, 2020). It is unclear why the childhood proxy of maltreatment did not appear to discriminate between those who self-reported ACEs, but one reason may be the reduced number of those responding that had prior low HOME scales. The other factor might be differences in recall as compared to prospective measures.

Not designed primarily about childhood experiences, designing CM proxy measures over time was challenging. While this is not the first study to use proxies for maltreatment like the HOME scale or spanking, it remains a limitation that no direct measures such as found in the Conflict Tactics Scale or administrative data on CPS reports are included. This makes it difficult to assess agreement between the prospective childhood measures and later adult recall. There did appear to be some correspondence between caregiver report of family conflict in childhood and later report of other ACEs that included DV and parental divorce so having had a more direct measure of maltreatment during childhood may have provided a similar correspondence to adult report of maltreatment. However, further research is needed to explore the differences from recent epidemiological studies in more details.

Also, except for caregiver perceptions, neighborhood variables had to be derived by adding in Census variables. It was not really possible to model change with decennial data because of the timing of the waves and the age of the children.

Conclusion

The study intended to explore the comorbidity of poverty, child maltreatment, and other ACEs. The previous research indicates that various factors at different (micro, mezzo, and macro) levels could interplay, affect family dynamics, trigger risk, and protective factors and contribute to the occurrence and nature of child maltreatment. The most recent studies

emphasized the significant impact of poverty on child wellbeing (NASEM, 2019). Thus, this study intended to contribute to the field by analyzing the relationships of poverty, prospective CM risk behaviors, and retrospective recall of ACEs.

The results suggest that both family level and neighborhood level poverty are associated with caregiver report of harsh and neglectful parenting even after controlling for demographics, family relationship dynamics and other neighborhood factors. Various indicators of poverty were associated with both caregiver reports of poor parenting as proxy for maltreatment and self-report of ACEs - though not always the same ones. Certain measures of poverty increased the likelihood of reporting of ACEs, while there was an indication that receipt of poverty services at birth decreased that likelihood. This adds to the growing literature indicating that poverty may play a causal role in poor parenting AND that policies targeting like the EITC or the now-ended COVID relief may hold promise in prevention. Given the apparent overlap in ACEs, studies should examine not only CM outcomes but other ACEs as well.

Most of the sample reported at least one ACE (about 80%), and there was little differentiation possible by type. This is consistent with an idea of comorbidity of different types of risk factors and poly-victimization (Cyr et al, 2012; Finkelhor et al, 2009; Finkelhor et al, 2015; Fong, 2017). It may be also that once some reaches adulthood, it is no longer possible to tease out distinct paths.

Further exploration of adult recall of ACEs, however, suggested that the co-occurrence of various ACEs was difficult to disentangle within scope this particular research. In other words, there were few differences by type of ACE, though a latent class analysis suggested it was possible to discriminate between those who reported more as compared to fewer ACEs but not between types. Also, despite number of family demographics (age of mother, child's age and

health), family dynamics, and contextual factors were important both in prospective and retrospective analysis, poverty measures remained significant in every model. Even though caregiver proxies of poor parenting were not good predictors of ACE self-reports, there still was some consistency between the caregiver report of family conflict and later ACEs.

Findings were also consistent with several other studies indicating that poverty at the neighborhood level also matters (Coulton et al., 2007; Drake & Pandey, 1996; Maguire-Jack, 2014; Maguire-Jack & Font, 2017; Shanahan et al., 2017;). Though, it is not still clear to what extent community development approaches that address resource gaps might be preventive and separate from family-level approaches.

Thus, despite a number of limitations to the measures and data, findings suggest that addressing income needs at an early age may have preventive impacts in both caregiver-reported behaviors that suggest maltreatment as well as later retrospective recall of maltreatment and other ACEs. The fact that it was difficult to differentiate between types of ACEs suggests that anti-poverty efforts may also impact the likelihood of other ACEs though more research is required to establish the range of benefits.

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