Economic Conditions and Risk for Child Physical Abuse per Maternal Report: The Mediating

Roles of Parenting Stress, Depression, and Domestic Violence

By

© 2015

Aislinn Conrad-Hiebner

Submitted to the graduate degree program in the School of Social Welfare and the Graduate Faculty of the University of Kansas in partial fulfillment of the requirements for the degree of Doctor of Philosophy.
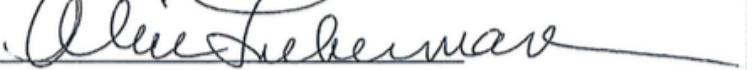
Margaret Severson, JD, MSW, Chairperson

Todd Little, PhD, Methodologist

Alice Lieberman, PhD, Committee Member
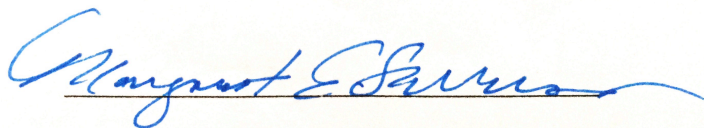
Edward Scanlon, PhD, Committee Member

John Rury, PhD, Graduate Studies Representative

Date Defended: April 30, 2015

The Dissertation Committee for Aislinn Conrad-Hiebner

certifies that this is the approved version of the following dissertation:

Economic Conditions and Risk for Child Physical Abuse per Maternal Report: The Mediating

Roles of Parenting Stress, Depression, and Domestic Violence

Margaret Severson, JD, MSW, Chairperson

Date approved: April 30, 2015

Abstract

Child physical abuse is a serious social problem associated with a host of risk factors and consequences, ranging from unemployment and poverty to substance use and criminality. Despite years of research on the etiology of child physical abuse, child physical abuse remains a persistent concern for our society. Exploring the relationship between poverty and child physical abuse is an underutilized approach for understanding and responding to child physical abuse. At present, much of the literature emphasizes the connection between maltreatment and income-based poverty. Using the family stress model, this dissertation research explores the impact of *economic conditions* (income and material hardship) on risk for child physical abuse, and the process by which these economic conditions contribute to an environment where child physical abuse occurs.

With a sample of 4,845 mothers from the Fragile Families and Child Well-being Study (FFCWS), a full panel model of mediation was conducted over three waves of data to investigate the invariance of the proposed model (economic state, housing hardship, bill-paying hardship, health hardship, food hardship, depression, parenting stress, domestic violence, risk for child physical abuse); the effect of the mediators (parenting stress, depression and domestic violence) on the relationship between economic conditions and risk for child physical abuse; and the strongest economic predictors of risk for child physical abuse.

Although the results indicate a good fit of the measurement and structural models to the data, the indirect and direct effects are negligible and non-significant, indicating no evidence of partial or full mediation ($p<.005$). Using $p<.05$, only one indirect pathway was significant: Maternal depression (year 5) significantly mediated the relationship between food hardship (year 3) and risk for child physical abuse (year 9) ($\beta=.007$, $p<.05$). Although the effect sizes were small, there were significant direct effects between bill-paying hardship and maternal parenting

stress and domestic violence, food hardship and maternal depression, and economic state and parenting stress ($p<.05$). These results support the use of an inclusive model to explore the relationship between economic conditions and risk for child physical abuse, suggest directions for future research, and highlight the importance of emphasizing the roles of economic conditions and child maltreatment in policies and practices that affect families.

Acknowledgements

Not only does it take a village to raise a child, but it also takes a village to finish a doctoral program. When I began the doctoral program years ago, I could not fathom the wonderful connections I would make and the support I would receive along the way. In addition to sheer will, determination, and an overwhelming desire to finish this program, I could not have completed this program without Margaret Severson, my mentor, advisor, editor, and cheerleader; my encouraging and wise dissertation committee comprised of Margaret Severson, John Rury, Ed Scanlon, Todd Little, and Alice Lieberman; my dissertation funding and network of mentors and colleagues graciously provided by the Doris Duke Charitable Foundation and Chapin Hall at the University of Chicago; the encouragement of my friends in the School of Social Welfare and beyond; and the everlasting support, love, and patience of my family.

Dedication

I am dedicating this dissertation to my husband. Although many people supported me along the way, my husband Braden championed my cause above and beyond the call of duty. When I didn't believe I could do it, Braden believed in me. When I voiced fears and worries, Braden reassured me. From the beginning to the end of this doctoral program, this journey would not have happened without you. Thank you for being a part of this with me.

Table of Contents

Listing of Tables and Figures

Chapter I: Introduction

In 2006, nearly 500,000 children in the United States endured incidents of physical abuse, which is the most prevalent form of abuse (Sedlak et al., 2010). Childhood physical abuse is associated with a range of psychological and social problems, including familial substance use, mental illness, domestic violence, and criminality, depression, suicidal thoughts, and academic failure (Sedlak et al., 2010). In this study, child physical abuse refers to acts that cause or could cause physical injury (DHHS, 2015).

The available literature points to a myriad of challenges facing physically abused children (e.g., Batten, Aslan, Maciejewski, &Mazure, 2004; Miller, Esposito-Smythers, Weismoore, & Renshaw, 2013; Norman et al., 2012). Abused children are confronted with more health, educational, relational, and delinquency concerns than non-abused children. Well-documented mental health problems experienced by physically abused children include depression, anxiety, distress, suicidal inclinations, and antisocial tendencies (Klika, Herrenkohl, & Lee, 2012; Lindert et al., 2013; Miller et al., 2013; Nanni, Uher, & Danese, 2012). Another concern is the negative association between physical abuse and children's cognitive and educational outcomes (Leeb, Lewis, & Zolotor, 2011). Physically abused children are more likely to not graduate from high school, to repeat grade levels, to experience impaired academic performance, and to be expelled (Kinard, 2001; Thornberry, Ireland, & Smith, 2001). Concerning their interpersonal relationships, abused children witness and experience more poor family functioning, familial abuse, and difficulties in their relationships than non-abused children (Cicchetti & Toth, 2005; Jaffee, 2007; Thornberry, Henry, Ireland, & Smith, 2010; White & Widom, 2008). Finally, abused children are more likely than non-abused children to engage in delinquent behaviors such as using substances and committing criminal acts (Herrera & McCloskey, 2001; Thornberry et al., 2010; Thrane, Hoyt, Whitbeck, & Yoder, 2006).

Many problems experienced by abused children also manifest in adulthood (Hager & Runtz, 2012; Herrenkohl et al., 2013; Widom, Czaja, Bentley, & Johnson, 2012). Although societal costs of maltreatment are difficult to estimate, a systematic review by Corso and Fertig (2010) determined that maltreatment cost society upwards of $135 billion in 2007 due to incarceration and lost employment opportunities, among others.

Purpose of this Dissertation Research

This dissertation research focuses on the relationship between risk for child physical abuse and economic conditions. Given the pervasiveness and consequences of child physical abuse, an increased understanding of the etiology of child physical abuse is of primary importance for researchers and policymakers. One salient area of inquiry involves the relationship between economic conditions and child physical abuse, an area neglected throughout history and social policy developments. In the literature, there is some indication that children from poorer families face greater risks for maltreatment overall than do children from non-poor families (Berger & Waldfogel, 2011). At present, much of the literature emphasizes the connection between maltreatment and income-based poverty. Using the family stress model (Conger et al., 1992), this dissertation research explores the impact of economic conditions on risk for child physical abuse, and the process by which these economic conditions contribute to an environment where child physical abuse occurs. Economic conditions encompass various types of material hardships, income-to-poverty ratio, and social assistance programs.

Therefore, the aim of this dissertation study is to explore how knowledge of economic conditions strengthens our understanding of child physical abuse and the prevention of child physical abuse. To accomplish this purpose, this study synthesizes the research on child physical abuse (Chapter I); outlines a conceptual framework based on Conger and colleagues' (1992) family stress model (Chapter II); systematically reviews the relationship between economic

conditions and child physical abuse (Chapter III); describes the methods of this dissertation research (Chapter IV); discusses the results (Chapter V); and explores the implications of the findings (Chapter VI).

Child Physical Abuse: A Social Problem

Child physical abuse is a far-reaching social problem with historical roots, policy implications, and personal, familial, and societal costs (Fallon et al., 2010; Manly, 2005; Shaffer, Huston, & Egeland, 2008). The following section briefly explores who is affected by child physical abuse and the associated consequences.

Most literature on child physical abuse refers to *Child Maltreatment 2013* (DHHS, 2015) or the *Fourth National Incidence Study (NIS) of Child Abuse and Neglect* (Sedlak et al., 2010) when reporting the prevalence of child physical abuse (Fallon et al., 2010; Fantuzzo, Stevenson, Kabir, & Perry, 2007; Jaffee et al., 2007; Wang & Holton, 2007).[1] Across the nation, young, Black, female, and economically disadvantaged children disproportionately experience physical abuse. In 2006, young children (ages 6 to 8) encountered far more physical abuse (7.7 per 1000 children) than their counterparts in any other age cohort, including children of ages 15 to 17 (5.9 per 1000 children) (Sedlak et al., 2010). In the same year, female children experienced 1.2 times the rate of abuse as compared to male children, while Black children experienced more physical abuse (9.7 per 1000 children) than both White and Hispanic children (4.6 and 5.9 per 1000, respectively; Sedlak et al., 2010). In 2006, children with low socioeconomic status and of caregivers no longer in the labor force faced the greatest risks of physical abuse (6.5 per 1000 children, 7.3 per 1000 children, respectively), significantly greater than non-poor children of

---

[1] This inquiry references the *NIS* because Sedlak and colleagues' (2010) study includes reports of maltreatment by

employed caregivers (2.2 per 1000 children, 3.4 per 1000 children, respectively; Sedlak et al., 2010).

Conditions of physical abuse. Child physical abuse is a complex issue with multiple and interrelated family characteristics and social problems. As a consequence, it is difficult to disentangle the relationships between physical abuse and family characteristics, e.g., family dynamics, and social problems including criminality, to understand which social problems and family characteristics have a greater impact on physical abuse. A related concern is that the social problems related to physical abuse also correlate with one another, such as the relationship between substance use and mental illness. Although not every condition of physical abuse will be examined, this section provides an overview of the social problems and family characteristics present in homes where child physical abuse is more likely to occur.

Co-occurring social problems. Physically abused children are more likely to come from families living with domestic violence, criminal behaviors, substance abuse, unsafe neighborhoods, and poverty (Appel & Holden, 1998; Edleson, 1999; Jaffee et al., 2007). In a systematic review of 155 studies with non-abused child comparison groups, Stith and colleagues (2009) calculated the effect sizes of multiple parent and family-level conditions on child physical abuse. Effect sizes calculated from meta-analyses are particularly important because these coefficients determine the magnitude of a relationship between two variables (McCough & Faraone, 2009). Concerning parent-level factors, the results indicate a range of small to large effects of drug abuse (d=0.16, p<0.05), alcohol abuse (d=0.34, p<0.001), criminal behavior (d=0.42, p<0.001), and domestic violence (d=0.62, p<0.001) on physical abuse.[2] These findings demonstrate that families of abused children are more likely to score higher on the

---

[2] According to Cohen (1988), effect sizes of .2 are considered small. .5 are moderate, and .8 are large.

aforementioned risk factors when compared to families of non-abused children. Effect sizes also can be understood as percentiles (Coe, 2012): When effect sizes are converted to percentiles, families of abused children experience higher levels of criminal behaviors when compared to 70% (*d*=.42) of families in the comparison group.

Regarding domestic violence, Appel and Holden (1998) reviewed more than 30 empirical studies, finding that 30 to 60% of children were physically abused when domestic violence was present in the home. Concerning mental health, Stith and colleagues (2009) found medium to large effects of parental stress (*d*=.39), depression (*d*=.55), psychopathology (*d*=.59), anxiety (*d*=.60), and anger/hyperactivity (*d*=.72) on child physical abuse (*p*<0.001) (Stith et al., 2009), demonstrating that parents of abused children score higher on mental health risk factors than 66% or more of comparison parents. Likewise, Sedlak and colleagues (2010) reported that mental illness accounted for 4.5% of all incidences of child physical abuse. A limitation of these findings is that the relationship between child physical abuse and family problems cannot be attributed to the causal influence of one over the other. Although child physical abuse is more likely in violent homes, for example, these results provide little evidence for a causal relationship between domestic violence and child physical abuse.

Family characteristics. Families of maltreated children share several characteristics ranging from parent-level to family-level factors. Regarding parent-level factors, Stith and colleagues (2009) reported small to medium effects of parents' gender (*d*=.13), age (*d*=-.20), and childhood histories of maltreatment (*d*=.44) on child physical abuse (*p*<.001). The results indicate that parents of abused children are younger than 58% of parents in the comparison group and report more histories of maltreatment when compared to nearly 70% of comparison families. In addition, Sedlak and colleagues (2010) found that males were more likely than females to physically abuse children (54% and 50%, respectively).

Research also demonstrates an association between family-level factors and child physical abuse. Concerning physical abuse, Stith and colleagues (2009) found moderate to large positive effects of spousal violence (d=.46), family conflict (d=.54), unplanned pregnancy (d=.58), physical discipline (d=.55), and parents who perceive children as a problem (d=.62) on physical abuse (p<.001), indicating that parents of abused children experience more spousal violence, family conflict, unplanned pregnancies, physical discipline, and negative perceptions of children as compared to approximately 66% to 75% of the comparison group. In addition, Stith and colleagues (2009) reported medium to large negative effects of marital satisfaction (d=-.32), social support (d=-.36), parent/child relationship (d=-.55), and family cohesion (d=-.68) on physical abuse (p<.001), demonstrating that parents of abused children have poorer marital satisfaction, social support, parent-child relationships, and family cohesion when compared to 62% to 76% of parents of non-abused children. Results also indicated small to medium effects of single parenthood (d=0.24) and family size (d=0.31) on physical abuse (p<0.001), demonstrating that families with abused children are larger than 62% of families with non-abused children. Likewise, Sedlak and colleagues (2010) found that families with four or more children were more likely to experience child physical abuse (7.81 per 1000 children) than families with one child (6.59 per 1000) or two to three children (5.65 per 1000). When examining family structure, Sedlak and colleagues (2010) found that biological caregivers represented the majority of physically abusive perpetrators (72%).

Other conditions of child physical abuse pertain to where families reside. Sedlak and colleagues (2010) found that families who live in highly populated urban areas experienced less child physical abuse (5.6 per 1000 children) than those in less populated urban areas (7.0 per 1000 children). In reality, children in rural settings experienced the highest levels of child physical abuse (8.5 per 1000 children; Sedlak et al., 2010).

Unemployment. Throughout the literature, unemployment has been correlated with child physical abuse using samples of families, neighborhoods, and urban communities (Fryer & Miyoshi, 1996; Slack et al., 2003). In a meta-analytic review of 155 studies with non-maltreated child comparison groups, Stith and colleagues (2009) found that unemployment shared a moderate, statistically significant effect on physical abuse (d=0.30, p<0.001). The authors did not report the duration of unemployment or who was unemployed.

In a study with a sample of 14,256 children from the United Kingdom (U.K.), Sidebotham and colleagues (2002) conducted logistic regression analyses and found moderate to strong relationships between unemployment and risk of maltreatment. The unemployment of the father or the mother increased the likelihood of substantiated maltreatment reports by 2.33 (p<.001) and 2.82 (p<.001), respectively. In another study, Courtney and colleagues (2005) interviewed a stratified sample of 1075 TANF applicants during two waves in Milwaukee County, Wisconsin. After collecting administrative and survey data, Courtney and colleagues (2005) conducted Cox proportional hazard analyses to determine the relationship between employment and rates of maltreatment investigations. The results indicated that working within the past year lessened participants' estimated risk of receiving a maltreatment investigation (HR=.71, p<.05). Likewise, in a low-income sample of families in Illinois, Slack and colleagues (2003) used Cox proportional hazards models and found that employment decreased parents' risk for Child Protective Services (CPS) investigations (B=-1.36, p<.001).

Summary. Taken together, the existing research illustrates that child physical abuse is a complex phenomenon comprised of several social problems and interconnected child, parent, and family characteristics. The findings suggest that families of maltreated children are more likely to be young, poor, and Black. There are also moderate to strong associations between child physical abuse and parental anger/hyperactivity, drug and alcohol use, psychopathology, and

childhood experience of abuse. Further, child physical abuse is more likely found in homes with family conflict and with parents who engage in domestic violence and have poor parent/child relationships. Other family conditions of child physical abuse include having larger families, being a single parent, and residing in rural settings. In essence, within this intricate web of family-social-environmental characteristics, it is difficult to separate the unique impact of each factor on child physical abuse and determine the best points of intervention.

Historical Responses to Child Maltreatment

Society's recognition of maltreatment as a social problem is relatively recent. Historical responses to maltreatment typically did not consider the impact of economic conditions on child maltreatment, either the influence of poverty on maltreatment, or the capacity of economic conditions to create an environment where maltreatment occurs. This review discusses responses to maltreatment from three particular and broad time periods: The 1700s to late 1800s, the late 1800s to the 1940s, and the 1950s to present.

1700s to Late 1800s: Destitute, dangerous, and deviant children. Early forms of child welfare were administered from the 1700s until the late 1800s through religious organizations such as the Ursuline Sisters' institutional care for "destitute" children and mothers in 1729, the Hebrew Benevolence and Orphan Asylums in 1832, and the Children's Aid Society in 1853 (Lenroot, 1956; Pumphrey & Pumphrey, 1967). Motivated by the Judeo-Christian values related to helping people who could not help themselves, these agencies often provided shelter, rehabilitation, and education for children who were seriously harmed, orphaned, or abandoned (Brace, 1872; Coleman, 1995; Pumphrey & Pumphrey, 1967). While providing services to families, these religious organizations reinforced the importance of parental responsibility.

Religious influences on child welfare services continued through the late 1800s, when child welfare agencies placed emphasis on reforming children who were labeled as deviant,

dangerous, or destitute (see Brace, 1872). "Deviancy" and "destitution" encompassed children in need of assistance beyond the family's resources and protection. Efforts to help children did not acknowledge how the environmental conditions of poverty and maltreatment may have led to the child needing assistance. In fact, there was limited recognition about poverty and maltreatment as social problems for children, leading to societal action only when children experienced serious harm or abandonment. Agencies focused more on children's immediate physical safety rather than on the contextual factors leading to the children's current situation, e.g., homelessness.

Late 1800s to 1940s: The era of "child saving". Until the late 1800s, there were no laws designed or organizations formed to protect children from abuse and neglect. In 1875, the New York Society for the Prevention of Cruelty to Children (NYSPCC) became the first child protection agency in the United States, established after the severe abuse of Mary Ellen Wilson (NYSPCC, 2012). In 1873, Etta Wheeler, a mission worker, received reports that Mary Ellen Wilson, age 9, an indentured servant of Mary and Francis Connolly, was being whipped, imprisoned, and left in her home without supervision. After failed attempts to involve the police and various other organizations, Etta Wheeler appealed for assistance to Henry Bergh, the president of the New York Society for the Prevention of Cruelty to Animals (Watkins, 1990). Once Henry Bergh's attorney petitioned the court to remove Mary Ellen Wilson from her home, Judge Abraham Lawrence of the New York Supreme Court agreed to hear the case. As a result of the testimony from neighbors and from Mary Ellen Wilson, Judge Lawrence removed Mary Ellen Wilson from the custody of her guardians and released her into the care of Etta Wheeler (Watkins, 1990).

As a result of Mary Ellen Wilson's case, agencies similar to the NYSPCC developed across the nation to investigate reports of maltreatment, enact child protection laws, prosecute alleged perpetrators, and shelter children who were abandoned, homeless, and maltreated

throughout the late 1800s to the mid-1900s (McCrea, 1910). By 1877, the American Humane Association had emerged as the national organization for maltreated children, with the White House Conference on the Care of Dependent Children (1909) and the Children's Bureau (1912), following as the first organized federal responses to child maltreatment (Pumphrey & Pumphrey, 1967). The Children's Bureau of 1912 focused on ensuring child wellbeing, safety, and permanent living situations (Ventrell, 1998).

From the 1920s to the 1940s, the federal government's power expanded considerably concerning oversight of children's wellbeing. In 1921, Congress directed states to develop their own children's bureaus (i.e., departments of child welfare or maternal/infant health) through the *Sheppard-Towner Maternal and Infancy Act* (Abbott, 1922; Ventrell, 1998). The *Sheppard-Towner Act* (1921) (H.R. 12634), a precursor of the *Social Security Act*, provided monies for the prevention of infant mortality, and the investigation and promotion of child health (Abbott, 1922; Lemons, 1969). In *Prince v. Massachusetts* (1944) (321 U.S. 158), the Supreme Court recognized the limits of parental authority in situations where children's welfare is comprised, and expanded the federal and state governments' authority to intervene in these situations on behalf of children.

Following this ruling, the U.S. government further intervened on behalf of children through the adoption of the *Social Security Act* (SSA) in 1935 (H. R. 7260). Through the SSA (1935), the federal government provided broad protections for vulnerable children through an economic safety net available to elders, children with disabilities, and unemployed people. The SSA (1935) contained two sections particularly relevant to the issues of poverty and child maltreatment: *Title IV – Grants to States for Aid to Dependent Children* (ADC) (H. R. 7260

§401) and *Title V – Grants to the States for Maternal and Child Welfare* (H. R. 7260 §501).[3]

Title IV authorized states to provide financial assistance to mothers when fathers die or desert the family (Committee on Economic Security [CEC], 1935). In essence, the CEC advocated for the passage of the SSA (1935) because of the relationship between families' financial security and child delinquency. In addition, Title V directed states to provide child and maternal health services, and to protect children in instances of delinquency, neglect, and homelessness using funds collected from a national payroll tax (CEC, 1935).

In this same time period, there were advances in the public's awareness regarding child physical abuse. In 1946, Dr. Caffey, a pediatric radiologist, published research that questioned whether subdural hematomas and long bone fractures in toddlers were accidental (Caffey, 1946). This research is unique in its attention to child physical abuse, rather than to overall child wellbeing and protection. In general, society in this time period experienced many advances related to the safety, wellbeing and economic security of children. With the exception of the SSA (1935) legislation, however, most of these social actions did not draw a connection between environmental factors, e.g., unemployment and poverty, and child wellbeing or child physical abuse.

The 1950s to present. The work of Dr. Caffey paved the way for the recognition of child physical abuse as a social problem. Prior to his study, there were few federal programs and policies enacted to address the specific issue of child maltreatment (Giovannoni, 1989). Even with the presence of child protection agencies throughout the early to mid-1950s, child abuse did not garner public attention again until Kempe and colleagues (1962) reframed child abuse as "battered child syndrome", a simplistic diagnosis confirmed through the examination of physical

---

[3] Title V is also known as *Title XX – Social Services Block Grant*, a permanent part of the SSA (1981) (P. L. 97-35).

symptoms (Sidebotham, 2001). In truth, the federal government viewed physicians as being the best-suited persons for diagnosing and treating child abuse (Lonne et al., 2009). Notably, labeling child abuse as a disorder avoided the complex environmental context contributing to child maltreatment, including familial, economic and social factors, and influenced the development of policy responses to child maltreatment (Lonne et al., 2009).

Policy responses. Related to economic conditions, the federal government expanded the population of children who could receive ADC benefits. Previously, benefits were limited to children with moral and suitable parents (e.g., wed mothers, employed parents) (H. R. 7260 §401). In 1961, the *Public Assistant Provisions Amendments* were added to the SSA (P. L. 87-31). These amendments extended ADC benefits to unemployed parents and children in foster care, and required state agencies to involve the court system for children at risk of removal. Along with making permanent the payments to children in foster care, other SSA amendments in 1962 (H.R. 10606 – P. L. 87-543) required that states provide services to families with children in foster care related to the improvement of their home conditions. In addition, this legislation required that child welfare service providers coordinate services with all involved social assistance providers (Cohen & Ball, 1962).

In response to Kempe's findings, Congress passed the *Child Abuse Prevention and Treatment Act* (CAPTA) in 1974, which directed states to develop child maltreatment definitions and reporting laws; to specify what events qualified as suspected maltreatment and who was mandated to report; and to establish criminal liability for specified forms of maltreatment (42 U.S.C.A. §5106a). Of all federal child welfare policies, CAPTA (1974) is still the only policy specific to child maltreatment. Further, although the SSA (1935) connects economic conditions to risk for child physical abuse through the requirement for coordinated services, only CAPTA

(1974) targets underserved groups (e.g., homeless families) in its child abuse prevention strategies.

Of particular importance to both child abuse and economic conditions are Title II of CAPTA (42 U.S.C.A. §5106) and the Strengthening Families Initiative (SFI), a national, primary prevention approach, address factors related to the economic conditions of child physical abuse (Center for the Study of Social Policy [CSSP], 2004). In 1985, the federal government amended Title II of CAPTA to include Community-Based Child Abuse and Neglect Prevention (CBCAP) grants, which provided the first federal funding for child maltreatment prevention programs (Child Welfare Information Gateway, 2011). Although CAPTA serves all children and parents, the target population includes underserved groups, racial and ethnic minorities, children with disabilities, fathers, and families at risk for homelessness (42 U.S.C.A. §5116b).

Although the language of Title II of CAPTA does not name poverty or economic conditions as an outcome of interest for its funded programs, CAPTA targets underserved groups and supports programs that offer formal and informal resources to families, which may include financial assistance. On the other hand, the SFI specifically names economic conditions, i.e., concrete supports, as a protective factor to buffer children from maltreatment. The SFI defines concrete supports as the ability to meet basic needs (e.g., food), and to access supports in times of need (CSSP, 2004). Although this definition clarifies CAPTA's inclusion of informal and formal supports, this protective factor in no way requires maltreatment prevention programs to examine families' economic circumstances.

Among other services, CAPTA supports CBCAP programs that offer access to formal and informal resources and referrals to other services. Both the population served and the services offered acknowledge the role of poor economic conditions, although the terms, "poverty", "economic", and "material hardship" are never explicitly stated. Further, the

legislation is vague concerning what services qualify as informal and formal resources, and who is included in "underserved" groups or families at risk for homelessness, which might include families affected by poor economic conditions. In addition, formal and informal resources may or may not include economic supports. The lack of precision in defining populations and services does not offer assurances as to whether economic conditions will receive appropriate attention as a risk factor of maltreatment.

In response to large caseloads and length of stay in foster care, Congress passed the *Adoption Assistance and Child Welfare Act* of 1980 (P. L. 96-272), the *Omnibus Budget Reconciliation Act* (OBRA) (1993) (P. L. 103-66), and the *Adoption and Safe Families Act* (ASFA) (1997) (P. L. 105-89). The *Child Welfare Act* (1980) (P. L. 96-272), which created Title IV-E of the SSA, and increased federal oversight over child welfare and foster care services by establishing procedures for case management, permanency planning, regular court reviews and adoption assistance programs. At the same time, OBRA (1993) provided funding to community-based services for child abuse prevention services through the Family Preservation and Family Support Services Program. Lastly, ASFA (1997) (P. L. 105-89) emphasized the importance of children's safety, permanency and wellbeing during their involvement with the child welfare system.

Summary. Historical responses to child maltreatment did not consider the impact of a family's economic circumstances on child maltreatment. Organizations and policies developed to intervene only when the wellbeing of children and families garnered public attention. Even then, with the exception of the SSA (1935), organizations and policies concentrated on achieving children's immediate safety often without considering the environmental factors associated with child maltreatment. This gap is exemplified by limited and vague legislative language

concerning economic conditions, and a lack of child welfare services addressing economic

conditions.

Chapter II: Conceptual Framework

Within the literature on child physical abuse, the ecological perspective and its variants (transactional approach) are often used to examine child physical abuse. The ecological perspective is a systems-based framework that examines personal and social problems in the context of the micro, mezzo, and macro levels of the environment (Belsky, 1980). Although the ecological perspective broadly explores the determinants of child physical abuse, ranging from individual-level factors to community-level factors, this perspective does not specify how or why child maltreatment occurs. This is the case because the ecological perspective is a meso-level theory of child maltreatment linking macro-level theories such as structural theory to micro-level theories such as attachment theory (Neuman, 2000).

A micro-level theory is needed to explain how economic conditions contribute to the occurrence of child physical abuse. Among available micro-level theories, few, if any, explain how economic conditions create an environment for child physical abuse to occur. As such, an adaptation of the family stress model of economic hardship (Conger et al., 1992) is proposed to understand the relationship between economic conditions and child physical abuse. The use of this model provides an important contribution to the limited body of theoretical knowledge that explores the relationship between economic conditions and child physical abuse. In fact, this conceptual framework could serve as the blueprint for national guidelines on preventing child maltreatment through the promotion of children's economic security.

Adaptation of the Family Stress Model

Although there have been very few applications of the family stress model to child physical abuse (Warren & Font, 2015; Yang, 2012), the family stress model provides the basis for such an application, particularly when considering the empirical evidence for relationship between economic hardship and parental distress (Ashiabi & O'Neal, 2007; Wu, 1996),

depressive symptoms and marital relationships (Davila, Bradbury, Cohan, & Tochulk, 1997; Conger et al, 2002; Goodman & Gotlib, 2002), and depression and parenting (McLoyd, 1990; Minkovitz et al., 2005; Newland, Crnic, Cox, & Mills-Koonce, 2013). Although the family stress model does not connect punitive parenting to child physical abuse, several researchers use harsh parenting as a proxy for child abuse, and place harsh parenting on the continuum of child abuse, ranging from sensitive, non-abusive parenting to abusive or neglectful parenting (Azar, 2002; Bolger et al., 1998; Brown, Cohen, Johnson, & Salzinger, 1998; Koenig, Cicchetti, & Rogosch, 2000).

In the proposed model, however, the family's *economic state*, including income, welfare receipt, and assets, replaces economic hardship; *material hardship*, for example, utility shutoffs, replaces economic pressures; *the mediating variables,* comprised of maternal depression, parenting stress, domestic violence and *risk for child physical abuse*, including harsh discipline and CPS reports, take the place of child adjustment (see Figure 1). These modifications simplify Conger and colleagues' (1992) model and align the model with the literature on material hardship, which is discussed in greater detail in the following pages.

Figure 1. The proposed conceptual model.
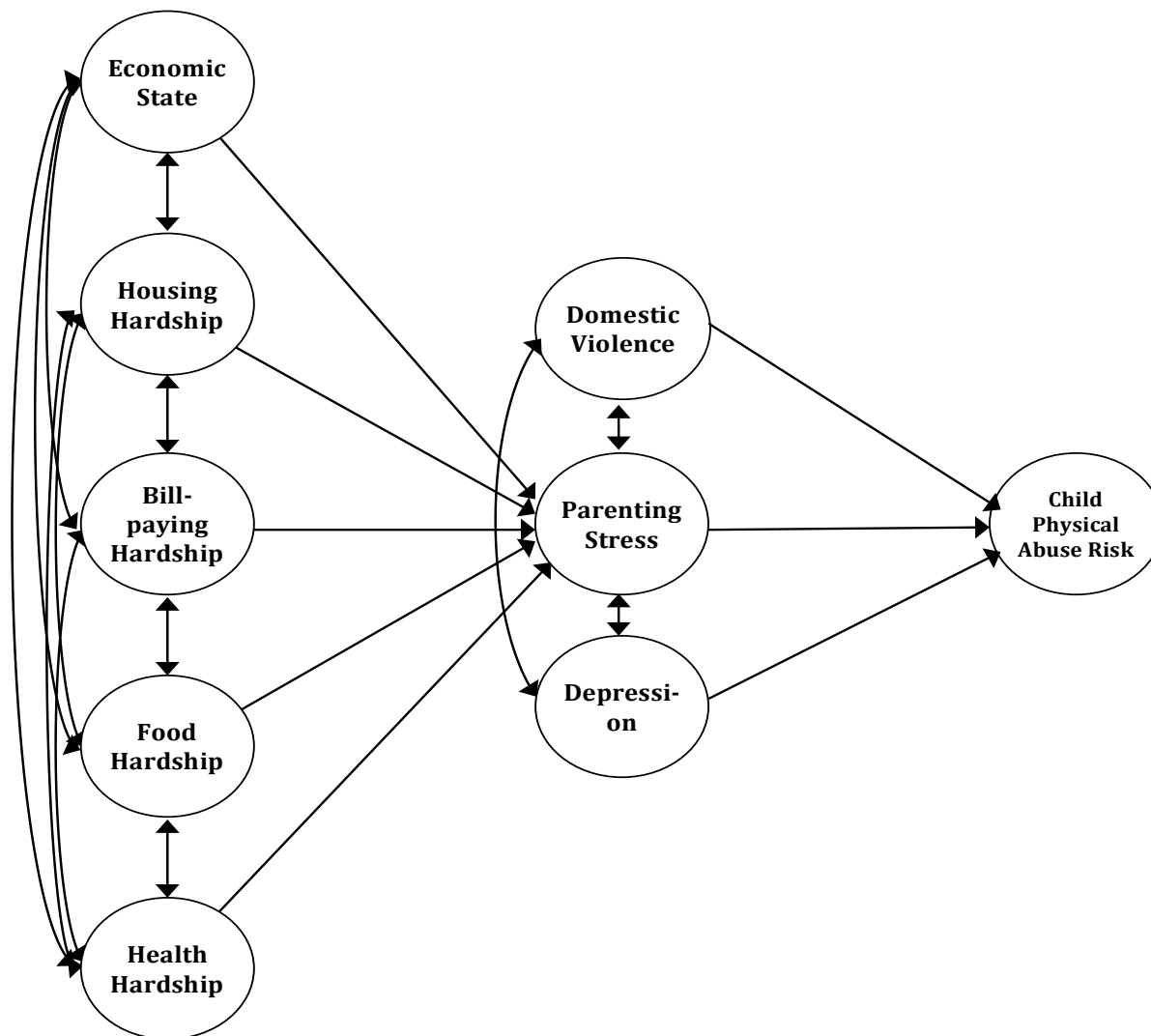
Material hardship. Material hardship occurs when people's consumption of goods and services is inadequate or fails to meet an acceptable minimum level (Beverly, 2001). These hardships are also known as deprivations, material needs, consumption items, and physical necessities (Fisher, 2001). Typically, material hardship includes indicators of food security, healthcare access, utility payments, housing quality, neighborhood conditions, and possession of consumer durables, which are discussed further in the next section (Beverly, 2001; Carle, Bauman, & Short, 2009; Heflin, Sandberg, & Rafail, 2009; Nelson, 2011).

In part, material hardship measures are a response to the criticism of income-based poverty measures, which often serve as economic indicators within child maltreatment research (Beverly, 2001; Citro & Michael, 1995; Ouellette et al., 2004; Nelson, 2011). One criticism is that income-based measures fail to capture resources beyond a family's current income. Besides income, other factors affecting a family's financial situation include assets, debt, access to credit, informal employment (e.g., babysitting), unofficial pay arrangements, and alternate methods for acquiring goods (Ringen, 1988).

A related concern is that income may not accurately measure wellbeing: Earning a certain income does not mean that a family meets its basic needs. There are conditions beyond current income that influence a family's standard of living, including expensive medical treatments and debt (Beverly, 1999; Mayer & Jencks, 1989, 1993). Further, the federal poverty threshold does not account for geographical differences and changes to standards of need related to childcare, travel and work expenses (Beverly, 1999; Ouellette et al., 2004; Short, 2001).

The use of material hardship provides a few key benefits to the proposed research. Primarily, the economic hardship indicator proposed by Conger and colleagues (1992) represents a subjective self-report of economic wellbeing. Proponents of material hardship argue that these subjective measures fail to capture the true state of people's economic wellbeing (Beverly, 2001). Instead, the use of material hardship provides more direct and objective measures of economic wellbeing than do income-based measures or subjective reports alone.

Summary

There are several gaps and limitations in the available theory and empirical evidence on the economic conditions of child physical abuse. The largest gaps pertain to the economic indicators themselves: To date, available literature has not established the relative contribution of each economic indicator to the occurrence of child physical abuse, including the importance of

the accumulation, severity, chronicity, and duration of each economic indicator. This dissertation study seeks to remedy this problem by proposing and testing a model of the economic conditions of child physical abuse. Researchers, practitioners, educators, and policymakers would benefit from understanding the necessary and sufficient economic conditions of child physical abuse. Such an inquiry would inform practice and policy and advance the evidence base within child maltreatment.

Chapter III: Review of the Empirical Literature on Economic Conditions and Risk for

Child Physical Abuse

The conceptual framework for this dissertation relies on an adaptation of the family stress model, as presented in Chapter II. The following empirical review fits well within the proposed conceptual framework by examining literature on child physical abuse and indicators of poor economic conditions, as mediated by parenting stress, depression, and domestic violence. Using criteria outlined by protocols for systematic literature reviews (Littell, Corcoran, & Pillai, 2008), this empirical review also includes a critique of the evidence for the relationship between child physical abuse and income, and between child physical abuse and material hardship, as mediated by parenting stress, depression, and domestic violence. For this review, unpublished and published dissertations and peer-reviewed studies available between 1970 and 2015 were included if they met the following criteria: 1) involved a longitudinal, prospective, cohort, random assignment, or matched group design; 2) included individuals or families as the unit of analysis; 3) used an indicator of income or material hardship; 4) contained a measure of child physical abuse risk, e.g., harsh parenting, substantiated or alleged physical abuse, involvement with Child Protective Services (CPS); and, 5) measured economic conditions prior to measuring risk for child physical abuse. Regarding the mediating variables, studies that met the inclusion criteria were examined for indicators of domestic violence, parenting stress and depression, and are also discussed in the following section.

Extensive searches of various databases, e.g., Google Scholar, Web of Science, PubMed, PsycINFO, Social Work Abstracts, with numerous search terms revealed 16 articles and dissertations relevant to this inquiry. Search terms for economic conditions included "income", "poverty", "hardship", "deprivation", "material", "economic", and terms for specific material hardships, e.g., housing. Search terms for physical abuse comprised "abuse", "maltreat", "child

welfare", "CPS", and "substandard parenting", among others. In the following sections, evidence on each economic indicator and mediating variable is examined in detail, beginning with income and ending with the mediating variables.

Economic State: Income and Welfare Receipt

Eleven of the reviewed studies demonstrate that low income, income transfers and welfare receipt, including Temporary Assistance to Needy Families (TANF), are related to child maltreatment and its proxies, including substandard parenting, child welfare investigations, substantiated reports of maltreatment, and spanking (Cancian, M., Yang, M.Y., & Slack, K. S., 2013; Courtney, Dworsky, Piliavin, & Zinn, 2005; Cox, Kotch, & Everson, 2003; Dworsky, Courtney, & Zinn; Fein & Lee, 2003; McDaniel & Slack, 2005; Newland et al., 2013; Ovwigho, Leavitt, & Born, 2003; Shook, 1999; Slack et al., 2003; Slack, Lee, & Berger, 2007; Yang, 2012).

Income transfers. Available literature typically considers families' risk for child welfare involvement because of participation in the Temporary Assistance to Needy Families (TANF) program. In an experimental study with random assignment among 3,959 single parents in Delware, Fein and Lee (2003) did not find statistically significant differences between rates of substantiated physical/emotional abuse for the experimental and control group. In this study, the control group was comprised of 1,821 participants in Delaware with traditional welfare benefits, i.e., Aid to Families with Dependent Children (AFDC), while the experimental group was comprised of 2,138 participants who received fewer welfare benefits (i.e., less cash, and more severe sanctions, time limits, and work requirements). This study, however, did not identify which welfare component has more of an influence on child maltreatment, and did not specify the type of analyses conducted. In addition, the study failed to specify whether covariates were included in the analyses, and combined physical and emotional abuse into one category, which

does not account for the different causal mechanisms of physical and emotional abuse. In addition, the findings of this study are only generalizable to poor families who qualify for TANF benefits in Delaware.

In the only other randomized control trial, Cancian and associates (2013) provide the most convincing evidence of an income effect among 13,062 Wisconsin mothers of non-marital children who enrolled in TANF in 1997. The experimental group received all of the child support money paid by the father while the control group received 41% of the child support owed. Cancian and colleagues (2013) conducted logistic regression to determine whether members of the experimental or control condition experience greater rates of maltreatment investigations over a two year period, while controlling for race and ethnicity, maternal education, maternal age, youngest child's age, number of children, number of fathers, history of AFDC receipt, type of social assistance received (i.e., case management versus cash assistance), employment status, presence of a child support order, and child support payment history. The results indicated that families receiving the full child support payments were 10% less likely to receive a subsequent child maltreatment investigation ($p<.05$), which is a modest, but statistically significant effect.

One limitation of the Cancian et al. (2013) work is that these findings are generalizable only to TANF populations in Wisconsin, not to national populations of families. Another limitation is that TANF participants represent a subset of all families who experience poverty and child maltreatment, thus excluding other maltreated and poor children whose families do not receive or qualify for TANF. Further, it is important to note that an underlying mechanism such as motivation may be responsible for the differences between the experimental group and control group. For example, the control group did not determine paternity as quickly as the experimental group (Cancian et al., 2013).

TANF. Slack and colleagues (2003) used Cox proportional hazards models to examine the relationship between TANF receipt and risk for reports to child protective services (CPS) among a stratified sample of 1,899 TANF participants from Illinois. When compared to the TANF-only participants, the results indicated a heightened risk of future CPS reports for parents who did not work or receive TANF (HR=.35, p<.001), employed parents without TANF (HR=.42, p<.001), and parents who worked and received TANF (HR=.26, p<.001), controlling for prior CPS involvement, history of TANF/AFDC receipt, race, wages, marital status, number of children, children's ages, income ratio, housing problems, poor health and mental health, learning disabilities, parenting stress, lack of social support, and substance use.

Courtney and colleagues (2005) interviewed a stratified sample of 1,075 TANF applicants during two waves in Milwaukee County, Wisconsin (see Dworsky et al., 2007). After collecting administrative and survey data, Cox proportional hazard analyses were used in both studies to determine the relationship between TANF receipt prior to wave one and subsequent rates of maltreatment investigations, after controlling for variables related to demographics, receipt of governmental assistance, socioeconomic status, parental wellbeing, e.g., domestic violence, and previous CPS involvement. The results indicated that receiving TANF prior to wave one was related to increased CPS investigations (*HR*=1.485, *p*<.05). This effect, however, lost statistical significance when prior CPS involvement was added to the analysis (*HR*=1.211, *p*=NS). Another study with Courtney and colleagues' (2005) sample across three waves of data, however, did not find a relationship between TANF and child maltreatment investigations (*HR*=1.091, *p*=NS) (Dworsky et al., 2007). An important limitation of this research is related to the sample-wise mean substitution technique for missing data. This is not a recommended imputation approach because mean substitution reduces the variances, biases the correlations, and reduces the confidence of the overall findings (Little, 2013).

TANF sanctions. Among a sample of 1,260 Illinois TANF recipients, Slack and colleagues (2007) conducted Cox proportional hazards models and fixed-effects models to investigate the relationship between TANF sanctions and maltreatment investigations and substantiations, while controlling for a variety of variables related to demographics and economic circumstances. Results from the event history analyses indicated no association between TANF sanctions and subsequent physical abuse reports (*HR*=1.03 – 3.48, *p*=NS) or between unemployment insurance earnings of $300 or more in the prior quarter (*HR*=.64, *p*=NS). In contrast, not receiving a TANF sanction of 50% or more in the preceding quarter was associated with physical abuse reports (*HR*=2.19, *p*<.01). This finding contradicts expectations. Slack and colleagues (2007) speculated that the characteristics of families who received stable amounts of cash assistance might differ substantially from the other TANF recipients with fluctuating cash amounts.

TANF and income. In a Chicago-based low-income sample of 706 single parents, Shook (1999) collected data on families for two years regarding their economic situation, life circumstances, CPS involvement and TANF sanctions. The results from the logistic regression indicated that families' risk for future CPS involvement increased when parents were poor (income <50% of the poverty threshold) (*OR*=2.31, *p*<.05) or received TANF sanctions of $75 or more while unemployed (*OR*=3.08, *p*<.01). In the model with low income, Shook (1999) controlled for a series of variables ranging from economic (e.g., TANF sanctions, material hardship) to demographics (e.g., age). In the model of TANF sanctions, only employment was controlled. As more covariates were added, the relationship between employment and sanctions of $75 and more with CPS involvement lost statistical significance (*OR*=2.17, *p*=NS). An important note is that this study did not address whether there is missing data or how it was handled, which could bias the findings or impact the strength of the association between the

variables of interest.

Similarly, with a longitudinal sample of 17,441 Maryland children of parents exiting TANF, Ovwigho and associates (2003) investigated the relationship between income and substantiated reports of maltreatment 12 months after parents exited TANF. For every $100 in monthly earnings, risk for maltreatment substantiations decreased by 1.3%, when controlling for variables related to family demographics, history of child welfare and cash assistance involvement, and reason for case closure (i.e., request, income/employment, earnings, post-exit economic circumstances).

Likewise, in a low-income sample of 219 families from North Carolina, Cox and colleagues (2003) conducted repeated measures logistic regression, finding that families within the bottom tertile of income distribution were 78% more likely to receive CPS reports ($p<.05$), while families in the top income tertile were 73% less likely to receive CPS reports ($p<.01$), as compared to the middle tertile, when accounting for covariates ranging from maternal history of child maltreatment, mental health concerns, demographics, and social support. Likewise, CPS reports were twice as likely for families receiving TANF benefits (OR=2.27, $p<.01$). One benefit of this statistical approach is its use of the generalized estimating equation to estimate the models. GEE handles the fixed covariates while adjusting for within-subject correlations. On the other hand, there are limitations regarding this study. One is that this study is generalizable only to young children of low-income families, mostly comprised of single mothers and African Americans. In addition, this study did not discuss its approach to missing data. Depending on whether missing data was handled, the findings may be biased or lack precision (Little, 2013).

In a longitudinal study with 1,137 TANF participants in Illinois, McDaniel and Slack (2005) conducted bivariate and event history analyses to determine the relationship between major life events and risk for maltreatment, as mediated by parenting stress, harsh parenting, and

material hardship. The covariates ranged from parenting behaviors to demographic information and life stressors. Results from the discrete-time logit models indicated that families who received TANF in the past three months were 2.62 times more likely to receive a subsequent CPS investigation ($p<.001$), when accounting for the time of occurrence. In contrast, although earning \$12,500 or more in the past year decreased families' risk for CPS investigations ($HR=.32, p<.001$), this effect disappeared when accounting for the time of the event ($HR=.49 - .96, p=$NS).

Other income. Using a sample of 1,142 mothers within two high poverty rural areas, Newland and colleagues (2013) conducted structural equation modeling to determine the relationship between economic pressure (self-reported ability to make ends meet), as mediated by maternal psychological symptoms, while controlling for state, race, age, education, marital status, and income-to-needs ratio. These covariates were treated as exogenous variables in the model. The final pruned model demonstrated acceptable fit, $\chi^2(2) = 3.92, p=.14$; CFI= 1.00; RMSEA = .03; SRMR = .01. Economic pressure had a small, negative and statistically significant indirect effect on maternal sensitive parenting through the pathway of depression ($\beta =-.03, p<.05$), in that reporting more economic pressure increases future maternal depression, which lessens the subsequent sensitivity of maternal parenting. Likewise, the income-to-needs ratio had a moderate, negative effect on subsequent economic pressure ($\beta=-.32, p<.001$), meaning that more income (a greater income-to-needs ratio) decreases a family's economic pressure. The study did not find any effects of the income-to-needs ratio on sensitive parenting ($\beta=.00, p=$NS) or of any of the exogenous variables on harsh parenting ($p=$NS). Full information maximum likelihood (FIML), a recommended approach, handled the missing data. The primary limitations of this model pertain to the use of manifest variables and the population. Unlike manifest variables, analyses with latent variables control for measurement and random error and

more closely estimate the true population parameters (Little, 2013). In addition, the results are generalizable only to two rural areas with high poverty.

Material Hardship

In addition to income and TANF, there is some evidence for the relationship between material hardships and child maltreatment, poor parenting, and child welfare involvement (Courtney et al., 2005; McDaniel & Slack, 2005; Slack et al., 2007; Slack, Holl, McDaniel, Lee, & Bolger, 2004). The ten reviewed studies examine five types of material hardship, including housing, food security, utility shut-offs, health insurance, and the number of material hardships (Courtney et al., 2005; Dworsky et al., 2007; Epstein, 2001; McDaniel & Slack, 2005; Ovwigho et al., 2003; Sidebotham et al., 2002; Shook, 1999; Slack et al., 2003; Slack et al., 2007; Yang, 2012).

Housing hardship. Although four studies found an association between housing hardship and risk of maltreatment (McDaniel & Slack, 2005; Sidebotham et al., 2002; Slack et al., 2003; Slack et al., 2007), four other studies reported mixed or non-significant associations (Courtney et al., 2005; Dworsky et al., 2007; Epstein, 2001; Yang, 2012). In a longitudinal study with a sample of 14,256 children from the United Kingdom, Sidebotham and colleagues (2002) conducted logistic regression analyses and found moderate to strong relationships between residential hardships and future substantiated incidences of maltreatment. Overcrowding, frequent moving, and subsidized housing increased the likelihood of future substantiated reports of maltreatment by 2.16 ($p<.01$), 2.81 (p value not reported), and 7.65 times ($p<.01$), respectively.

In a longitudinal study with 1,137 TANF participants in Illinois, McDaniel and Slack (2005) conducted event history analyses to determine the relationship between major life events and risk for maltreatment, as mediated by parenting stress, harsh parenting, and material

hardship. Material hardship is defined as parents' self-reported feelings about their financial situation based on an undisclosed number of items. The covariates included parenting behaviors, demographic information, and life stressors. Results from the discrete-time logit models indicated that families who moved once or more in the previous year were 1.74 times more likely to experience a subsequent CPS investigation ($p<.05$), taking the time of the event into account. Unfortunately, this study does not specify how the material hardship indicator was calculated or the number of items included.

Similarly, in a study with 1,899 TANF participants in Illinois, Slack and colleagues (2003) reported that parents receiving a maltreatment investigation were more likely to experience a housing hardship ($r=.39$, $p<.05$) when compared with parents never receiving a maltreatment investigation ($r=.27$, $p<.05$). Likewise, results from Cox proportional hazards models demonstrated that parents with housing problems were twice as likely to experience CPS involvement (HR=1.91, p<.001), when controlling for prior CPS involvement, history of TANF/AFDC receipt, current TANF and employment status, race, wages, marital status, number of children, children's ages, income ratio, parental stress, poor health and mental health, learning disabilities, lack of social support, and substance use. Housing hardship is defined as homelessness, eviction, doubling up, or difficulty paying rent in the prior 12 months.

In a similar investigation, Slack and colleagues (2007) conducted Cox proportional hazards models and reported that any eviction, doubling up or nonpayment of rent was associated with later reports of physical abuse ($HR=1.92$, $p<.05$), but not with maltreatment substantiations ($HR=1.32$, $p=$NS) over a four year period with a sample of 1,260 Illinois TANF recipients. The covariates ranged from demographic variables to indicators of the family's economic situation. The study does not differentiate between abuse and neglect substantiations, meaning that the effect on housing may be attributed to abuse, neglect, or a combination of the

two. This is problematic because abuse and neglect are thought to have distinct etiologies (Belsky, 1993), potentially leading to flawed or inaccurate associations between housing and child physical abuse or child neglect.

In a longitudinal study with 1,135 TANF recipients in Illinois, Yang (2012) conducted stepwise logistic regression analyses to determine whether housing hardship predicts the risk for a child physical abuse investigation, as mediated by parents' psychological distress. Housing hardship is measured through four dichotomous variables, including nonpayment of full rent, eviction for nonpayment, living with family/friends, and homelessness. The results from the fixed effect and pooled logistic regression analyses indicated no statistically significant relationship between housing hardship and risk for child physical abuse, even when excluding the covariates and mediating variables. Yang (2012), however, found an association between housing hardship and any CPS involvement in both the pooled logit and fixed effects models (HR=1.83, 2.22, p<05, p<.01, respectively) when accounting for all the covariates. A limitation is that abuse, neglect, or both may be captured by the CPS involvement variable, which is problematic because neglect and abuse are thought to have different etiologies (Belsky, 1993).

In contrast, two studies do not find an association between housing and CPS involvement (Courtney et al., 2005; Epstein, 2001). Courtney and colleagues (2005) interviewed a stratified sample of 1,075 TANF applicants during two waves in Milwaukee County, Wisconsin. After collecting administrative and survey data, Courtney and colleagues (2005) conducted Cox proportional hazard analyses to determine the relationship between housing hardship and rates of maltreatment investigations, controlling for demographics, socioeconomic status, parental wellbeing, and previous CPS involvement. The results indicated no statistically significant relationship between the bivariate housing hardship variables (i.e., doubling up, homelessness) and later CPS involvement (*HR*=1.076, 1.646, respectively, *p*=NS).

In another study, Epstein (2001) followed a sample of 637 low-income mothers receiving state-funded prenatal care in California for two years to determine whether unstable/transient housing, a bivariate variable, is associated with substantiated child abuse, a combined variable of physical, sexual and emotional forms of abuse, after controlling for variables related to demographics, health/mental health, substance use, race and ethnicity, receipt of governmental assistance, financial circumstances, and living arrangements. The results from the stepwise logistic regression analyses demonstrated no statistically significant relationship between unstable/transient housing and substantiated child abuse (*results not reported*). A primary problem with interpreting these results is the fact that child abuse is comprised of three very different categories of abuse. Another concern is the use of one bivariate indicator to capture housing hardship, which is thought to be multidimensional and more fully represented with multiple indicators (Oullette et al., 2004).

Food insecurity. Food insecurity is another important component of material hardship. Only four studies examined the effect of food insecurity on maltreatment risk (Epstein, 2001; Ovwigho et al., 2003; Slack et al., 2007; Yang, 2012). In a sample of 637 low-income mothers receiving state-funded prenatal care in California, Epstein (2001) conducted stepwise logistic regression analyses to investigate whether accessing emergency food, a bivariate variable, increases substantiated child abuse, a combined variable of physical, sexual and emotional forms of abuse, after controlling for variables related to demographics, health, mental health, race and ethnicity, financial circumstances, and living arrangements. Epstein (2001) found that families who accessed emergency food or other services were eight times more likely to have substantiated incidences of abuse than families who did not access emergency food ($p<.01$). A primary problem with interpreting these results is that child abuse is comprised of three very different categories of abuse, which may have different causes and consequences. Another

concern is the use of one bivariate indicator to capture housing hardship, considered to be a multidimensional construct (Ouellette et al., 2004).

Likewise, in a longitudinal sample of 17,441 Maryland children of TANF-leavers, Ovwigho and colleagues (2003) conducted discrete time event history analyses and found that receiving food stamps increases children's odds of a maltreatment substantiation by 20.1%, when controlling for variables related to family demographics, history of child welfare and cash assistance involvement, and reason for case closure, i.e., request, income/employment, earnings, and post-exit economic circumstances. Given that food stamp receipt is the only indicator of food hardship this study, the relationship between food stamps and substantiated maltreatment may be due to families' increased exposure to the overall welfare system. In addition, like housing hardship, food hardship is multidimensional and is represented best with multiple indicators (Ouellette et al., 2004).

In a longitudinal study with 1,135 TANF recipients, Yang (2012) conducted logistic regression analyses to determine whether food hardship predicts the risk for a child physical abuse investigation, as mediated by parents' psychological distress. Food hardship comprises four dichotomous variables related to reducing portion sizes and relying on low-cost/unbalanced meals. The results indicated that food hardship increased families' risk for physical abuse investigations by 1.77 times ($p<.05$), while controlling for the measurement wave. These results, however, did not hold when the mediating variable and covariates, i.e., socio-demographic, wellbeing, parenting, were added, or when fixed effect logistic regression analyses were conducted.

In contrast, among a sample of 1,260 Illinois TANF recipients, Slack and colleagues (2007) found no effect of food hardship on subsequent investigations of physical abuse (*HR*=.88, *p*=NS) or maltreatment substantiations (*HR*=.89, *p*=NS). This study defines food insecurity as a

summation of five questions from the U. S. Department of Agriculture's Core Food Security

Module, which asks families about behaviors towards food over the past 12 months, including

skipping or reducing portions, and lacking balanced meals. A limitation of these findings is that

participants' scores regarding food hardship are low and homogenous: Participants scored a 5.98

out of 15 total points (*SD*=1.78) for food hardship, indicating low amounts of hardship.

Utility shutoffs. In a longitudinal study with 1,135 TANF recipients, Yang (2012)

conducted logistic regression analyses to determine whether utility shutoffs, a combined variable

of disconnected phone or gas/electric services, predict the risk for a child physical abuse

investigation, as mediated by parental psychological distress. According to the results from the

pooled logit and fixed effect models, there was no statistically significant relationship between

utility shutoffs and child physical abuse investigations (*OR*=.81, 1.13, respectively, *p*=NS).

An important note is that the field material hardship uses a different definition of utility

hardship than the definition in Yang's (2012) study. Typically, utility shutoffs are part of a

category of bill-paying hardship, which often includes partial or nonpayment of utility bills and

rent or mortgage, eviction for failure to pay, disconnected phone services due to nonpayment,

and failure to meet a household's basic expenses (Heflin et al., 2009; Mayer & Jencks, 1989).

Health hardship. There are only four studies meeting the inclusion criteria for this

literature review that examine health hardship as an economic indicator of maltreatment. None of

the studies found a relationship between health hardship and child physical abuse (Courtney et

al., 2005, Dworsky et al., 2007; Ovwigho et al., 2003; Yang, 2012). Using a sample of 1,075

TANF applications from Milwaukee County, Wisconsin, Courtney and colleagues (2005)

conducted Cox proportional hazard analyses to determine the relationship between TANF receipt

prior to wave one and subsequent rates of maltreatment investigations, after controlling for

variables related to demographics, receipt of governmental assistance, socioeconomic status,

parental wellbeing, e.g., domestic violence, and previous CPS involvement. The results indicated no statistically significant relationship between lacking health insurance for one or more children and subsequent CPS investigations (*HR*=.981, *p*=NS).

Likewise, Dworsky and colleagues (2007) found no statistically significant relationship between having one child uninsured and future maltreatment investigations (*HR*=1.154, *p*=NS) in a sample of 1,075 TANF applications in Wisconsin. This study included a variety of covariates pertaining to the families' economic situation, demographics, and individual stressors (e.g., child behavior). Both studies (Courtney et al., 2005; Dworsky et al., 2007) operationalize health hardship as whether one or more child is uninsured, without specifying whether the whole family is uninsured or whether the child's insurance is private or Medicaid. This indicator may be responsible for the lack of significant findings.

In a longitudinal study with 1,135 TANF recipients in Illinois, Yang (2012) conducted logistic regression analyses to determine whether health hardship predicts the risk of a child physical abuse investigation, as mediated by parents' psychological distress. A health hardship occurs if the family cannot afford a doctor or hospital visit when needed during the past 12 months. The results indicated no statistically significant relationship between health hardship and risk for physical abuse investigations (*OR*=1.01, 1.85, *p*=NS), regardless of the covariates added or analysis conducted (pooled logit versus fixed effect).

Further, with a longitudinal sample of 17,441 children of parents who exit TANF from Maryland, Ovwigho and colleagues (2003) conducted discrete time event history analyses and found that health hardship was not related to future substantiated incidences of maltreatment (OR=1.125, p=NS), when controlling for variables related to family demographics, history of child welfare and cash assistance involvement, and reason for case closure (i.e., request, income/employment, earnings, post-exit economic circumstances). In this study, health hardship

is defined as the receipt of state-funded medical assistance. Given that state medical assistance is the only indicator of health hardship, the lack of relationship between medical assistance and substantiated maltreatment may be due to the use of one bivariate indicator. Literature on material hardship, for example, indicates the use of three primary indicators for health hardship, including having private health insurance, Medicaid, or Medicare; not visiting the dentist when needed in the past 12 months; and not going to the doctor or hospital when needed in the past 12 months (Heflin et al., 2009).

Amount of material hardship. In the literature, five studies investigate the summed or cumulative nature of material hardships on child maltreatment (Courtney et al., 2005; Dworsky et al., 2007; Shook, 1999; Sidebotham et al., 2002; Yang, 2012). Regarding the cumulative nature of material hardships, Courtney and colleagues (2005) conducted Cox proportional hazard analyses to examine predictors of families' involvement with child welfare among 1,075 TANF applicants in Milwaukee (see Dworsky et al., 2007). One predictor, the number of material hardships experienced by families, influenced families' risk for maltreatment investigations (*HR* = 1.097, *p*<.01) (Courtney et al., 2005). Each additional hardship increased the risk of a future maltreatment investigation by 10%. Material hardships in this investigation include shutoff utilities, disconnected phone lines, eviction, homelessness, and a lack of medical insurance for any child, among other events. A significant limitation is that the research findings do not distinguish between the unique contributions of each material hardship to the risk of maltreatment investigation. In essence, it is not known whether shut-off utilities or eviction is more predictive of families' risk of investigations. Further, this study does not separate neglect and abuse investigations, meaning that results may be attributed to abuse or neglect, or both.

In a longitudinal study of 14,256 children from the U.K., Sidebotham and colleagues (2002) conducted logistic regression analyses and found that families' risk for substantiated

maltreatment increased exponentially as families experienced more material deprivations, including subsidized housing, overcrowding, father's unemployment, and the absence of a car. For example, experiencing one indicator of material deprivation increased the substantiation risk by 9.58 times (*p* value not reported), while experiencing four indicators of deprivation increased substantiated maltreatment reports by 111.36 times (*p* value not reported). One limitation is that missing data was handled through the missing indicator method, meaning that missing data is considered a separate category in each explanatory variable. This approach is not a recommended modern imputation technique (Little, 2013).

Similarly, with a Chicago-based low-income sample of 706 single parents, Shook (1999) found that TANF recipients who experienced economic hardship, a dichotomous variable comprised of threat of eviction, food shortage and utility shutoffs, were four times more likely to have a substantiated report of maltreatment (*OR*=4.30, *p*<.01), when controlling for a series of variables ranging from economic (e.g., TANF sanctions, material hardship) to demographics (e.g., age).

In a longitudinal study with 1,135 TANF recipients, Yang (2012) investigated whether the experience of any material hardship predicts the risk for a child physical abuse investigation, as mediated by parents' psychological distress. When accounting for demographic, wellbeing, and parenting covariates, the results from the fixed effect logistic regression analysis demonstrated that experiencing any hardship increased families' risk for physical abuse investigations by 4.76 times (*p*<.001). When the number of hardships was summed, however, the significant effect on child physical abuse disappeared. In contrast, when the number of hardships was dichotomized, results from the fixed effect logistic regression analysis indicated that experiencing 1, 2, and 3 or more hardships significantly increased the risk for a child physical abuse investigation (*OR*=3.30, 6.55, 7.90, respectively, p<.05), when accounting for both the

covariates and mediating variable.

Mediating Variables

In addition to the direct associations between economic conditions and child physical abuse, economic conditions are indirectly associated with child physical abuse through parenting stress, leading to poor parenting, which is related to child physical abuse (Berger, 2004; Duncan et al., 1994; McLoyd, 1998; Votruba-Drzal, 2003). The following review examines nine articles pertaining to depression, parenting stress, and domestic violence (Courtney et al., 2005; Dworsky et al., 2007; Eamon, 2001; Epstein, 2001; McDaniel & Slack, 2005; Slack et al., 2003; Slack et al., 2007; Yang, 2012; Yeung, Linver, & Conger, 2002).

Of the three mediating variables, depression has the most support in the research. In a nationally representative sample of 753 preschool children and their families, Yeung and colleagues (2002) conducted structural equation modeling analyses and found that maternal depression mediated the relationship between an index of self-reported economic strains and spanking, after controlling for numerous demographic variables, e.g., age, gender, race, low birth weight, education, cognitive ability, and family structure. There were modest, statistically significant effects of economic strain on maternal depression (SE=0.14, p<0.05), and of maternal depression on punitive parenting (SE=0.14, p<0.05). Although the results are small, economic pressure is indirectly associated with punitive parenting practices through maternal depression. An important note is that punitive parenting practices are not necessarily representative of child physical abuse.

In addition, Dworsky and colleagues (2007) found that parental depression increases reports of child maltreatment by (HR=1.012, p<.05) among children age 4 and older using a sample of 1,075 TANF applicants in Milwaukee County, Wisconsin. Likewise, Yang (2012) conducted logistic regression analyses to determine whether material hardship predicted the risk

for a child physical abuse investigation, as mediated by parental depression, among a longitudinal sample of 1,135 TANF applicants in Illinois. Using a pooled logit model with individual hardships such as food, results indicated a significant effect of depression on child physical abuse investigations (OR=1.38, $p<.05$), while controlling for a host of covariates, ranging from the measurement wave to demographic and parenting variables.

In contrast, using a sample of 637 low-income mothers receiving state-funded prenatal care in California, Epstein (2001) conducted stepwise logistic regression analyses and found no association between maternal depression and subsequent physical abuse substantiations (*results not reported*).

Domestic violence. Cox and associates (2003) used a low-income sample of 219 families from North Carolina and conducted repeated measure logistic regression analyses. The results demonstrated that child maltreatment was two times more likely within two years of reported domestic violence (OR=1.93, $p<.05$), when controlling for a series of covariates ranging from maternal history of child maltreatment, mental health concerns, demographics, and social support.

Likewise, with a sample of 637 low-income mothers receiving state-funded prenatal care in California, Epstein (2001) conducted stepwise logistic regression analyses and demonstrated that the mother's experience of domestic violence increased the risk for subsequent physical abuse substantiations (OR=4.5, $p<.05$), after controlling for variables related to demographics, health/mental health, substance use, race and ethnicity, receipt of governmental assistance, financial circumstances, and living arrangements. Child abuse is a combined variable of physical, sexual, and emotional forms of abuse. A primary problem with interpreting these results is the fact that child abuse is comprised of three very different categories of abuse.

Another concern is the use of one bivariate indicator to represent experiences with domestic violence. One advantage is that this study used multiple imputations to handle missing data.

In addition, Yang (2012) found that domestic violence was associated with reports of child physical abuse (*OR*=1.93, *p*<.05) when examining cumulative material hardship from pooled logistic regression analyses. Yang's (2012) study analyzed data from 1,135 Illinois TANF recipients and included several covariates, ranging from demographic variables to indicators of wellbeing.

In contrast, with a Chicago-based low-income sample of 706 single parents, Shook (1999) collected data on families for two years regarding their economic situation, life circumstances, CPS involvement and TANF sanctions. The results from the logistic regression indicated that families' risk for CPS involvement was not related to experience with domestic violence in the previous two years (*OR*=1.13, *p*=NS), when controlling for a series of variables ranging from economic (e.g., TANF sanctions, material hardship) to demographics (e.g., age).

Domestic violence and parenting stress. In a longitudinal study with 1,137 TANF participants in Illinois, McDaniel and Slack (2005) conducted bivariate and event history analyses to determine the relationship between major life events and risk for maltreatment, as mediated by parenting stress, harsh parenting, and material hardship. The covariates ranged from parenting behaviors to demographic information and life stressors. Results from the discrete-time logit models found no association between parenting stress or domestic violence with subsequent CPS investigations (*HR*=1.01, .91, respectively, *p*=NS), when accounting for the time of event.

Domestic violence and depression. With a sample of 1,397 young children from the 1992-1994 National Longitudinal Survey of Youth, Eamon (2001) conducted structural equation modeling (SEM) analyses to determine whether family risk factors, i.e., poverty, maternal age at birth, education, depression, and marital conflict, are related directly and indirectly to physical

discipline and children's socio-emotional problems among two-parent families. The results indicated adequate model fit, χ^2(df 77, n=698)=262.16, p<.001; RMR=.036; AGFI=.932; CFI=.944, with small, indirect effects of poverty on physical punishment (β=.078, p<.01), through the mediators, maternal depression (direct β=.175, indirect β=.069, p<.01), and marital conflict (direct β=.163, p<.01).

Among a sample of 1,260 Illinois TANF recipients, Slack and colleagues (2007) conducted Cox proportional hazards models and fixed-effects models to investigate the effect of TANF sanctions, parenting stress, depression and domestic violence on physical abuse reports and maltreatment substantiations, while controlling for a variety of variables related to demographics and economic circumstances. Results from the event history analyses indicated that the mother's experience with depression and domestic violence increased the likelihood for subsequent reports of physical abuse (HR=1.03, p<.05, HR=2.62, p<.01, respectively), but not for maltreatment substantiations (HR=1.00, 1.82, p=NS). There was no association between parenting stress and physical abuse reports or maltreatment substantiations (HR=1.00, 1.05, p=NS).

Parenting stress. In a study with 1,899 TANF participants in Illinois, Slack and colleagues (2003) used Cox proportional hazards models to examine the relationship between TANF, employment, parenting stress, and risk for CPS involvement. The results did not reveal an association between parenting stress and risk for CPS involvement (r=.03, p=NS), demonstrating that parents with any CPS involvement experienced less parental stress (M=17.48, p<.10) than parents with no CPS involvement (M=17.75, p<.10). The study controlled for prior CPS involvement, history of TANF/AFDC receipt, current TANF and employment status, race, wages, marital status, number of children, children's ages, income ratio, housing problems, poor health and mental health, learning disabilities, lack of social support, and substance use.

In contrast, using a low-income sample of 219 families from North Carolina, Cox and colleagues (2003) conducted repeated measures logistic regression and found that everyday stressors were not related to CPS reports (*OR*=1.01, *p*=NS), when controlling for a series of covariates ranging from maternal history of child maltreatment, mental health concerns, demographics, and social support. One limitation is that these results are generalizable only to low-income families who primarily are African-American single moms.

Parenting stress and depression. Regarding both depression and parenting stress, Courtney and colleagues (2005) conducted Cox proportional analyses to determine the relationship between TANF and maltreatment investigations among 1,075 TANF applications in Wisconsin (see Dworsky et al., 2007). While the findings demonstrated a lack of statistical significance between depression and subsequent maltreatment investigations (*HR* = 1.006, *p*=NS), there was a statistically significant relationship between parental stress and subsequent maltreatment investigations after prior CPS involvement was added to the model (*HR*=1.035, *p*<.05). In both cases, a host of covariates related demographics, receipt of governmental assistance, socioeconomic status, and parental wellbeing, e.g., domestic violence. Unlike Courtney and colleague (2005), Dworsky and colleagues (2007) found no statistically significant effects for parenting stress on subsequent maltreatment investigations. Parenting stress did not have a statistically significant impact on subsequent CPS involvement (*HR*=1.017 – 1.027, *p*=NS).

Critique of the Empirical Literature

This systematic review of the relationship between economic conditions and risk for child physical abuse illustrates the limitations of the existing body of empirical work and identifies avenues for further exploration. Based on the evidence reviewed herein, the strongest relationships occur between risk for child physical abuse and income transfers, TANF sanctions

and cumulative hardship. At best, there is mixed support for housing and food hardship, and only minimal support for utility shutoffs and health hardship. Related to the mediators, depression has the most support, with mixed findings for parenting stress and domestic violence.

As a whole, the inconsistent findings probably result from the operationalization of the study variables, the timing of measurement, the study sample, and the methodology. Studies operationalize the risk of child physical abuse in different ways. Risk for child physical abuse is conceptualized as CPS involvement (Courtney et al., 2005), a combination of substantiated physical, sexual, or emotional abuse (Epstein, 2001), sensitive parenting (Newland et al., 2013), investigated reports of physical abuse (Slack et al., 2007), and substantiated incidences of maltreatment (Yang, 2012). There are potential concerns about collapsing different types of maltreatment into one category of overall maltreatment. One issue is that neglect and abuse are thought to have different etiologies (Belsky, 1993). If neglect and abuse have disparate causes, any subsequent findings may be misconstrued. In other words, any significant findings that use an overall maltreatment indicator cannot attribute the effect to a specific form of neglect or abuse. In the case of Epstein's (2001) findings it is possible that physical abuse is more responsible than emotional abuse for any significant findings. Belsky (1993), in fact, argues that better precision of maltreatment categories is needed in future research.

Similar to definitions of maltreatment, the definitions of income and material hardship vary by study. Income and income transfers, for example, may include income from unemployment insurance (Shook et al., 2007) or income from TANF payments (Courtney et al., 2005; Dworsky et al., 2007; Shook, 1999). As mentioned above, there are various and variable definitions of material hardship, ranging from unstable/transient housing (Epstein, 2001) to doubling up (Sidebotham, 2002) to represent housing hardship. In addition to the multiple definitions, a solid conceptualization of material hardship is lacking. Literature on material

hardship construes each hardship as a distinct, contextual construct with multiple indicators (Ouellette et al., 2004), instead of one indicator of hardship (Epstein, 2001). In fact, some of the hardships across studies share indicators. For example, Slack and colleagues (2007) measured housing hardship as the nonpayment of rent while Heflin and colleagues (2009) categorized the nonpayment of rent as a bill-paying hardship (Heflin et al., 2009). Although bill-paying and housing hardship are both material hardships, they should represent unique constructions of overall material hardship. By sharing nonpayment of rent, neither bill-paying hardship nor housing hardship represents distinct constructs of material hardship. This poses problems for the interpretation of any associated findings and future application of material hardship to child maltreatment. Finally, very few studies consider the impact of car ownership, childcare, debt or assets on risk for child physical abuse (Sidebotham et al., 2002).

There are also limitations related to the timing of measurement and study samples. For example, Epstein (2001) measured housing hardship prenatally and maltreatment risk between the child's birth and two years, while Slack and colleagues (2007) measured housing hardship during the past 12 months. Instead of using longer time lags, shorter time lags may be more sensitive to change over time. Likewise, measuring maltreatment risk among toddlers (Epstein, 2001) may yield different results than measuring maltreatment risk among older children (Slack et al., 2007) due to the increased maltreatment risk associated with young age (Sedlak et al., 2010).

The third set of limitations relates to the study participants. A majority of the studies use samples of low-income participants at the state level, rather than nationally. The impact of income on child maltreatment will be smaller and less consistent when researchers base their samples on low-income participants. In these situations, there is little variability in income levels, which may lead to inconclusive findings about the relationship between income and

maltreatment (Cancian et al., 2010; Slack et al., 2003). For example, some income reductions predict involvement with child welfare (Cancian et al., 2013; Fein & Lee, 2003), while other income reductions may not predict child welfare involvement (Shook, 1999; Slack et al., 2007). Similarly, there are limitations related to location and population that impact the generalizability of the findings. Most of the studies' findings are generalizable only to TANF populations within certain states, which limits their applicability to national populations of families. Another limitation is that TANF participants represent a subset of all families who experience poverty and child maltreatment, thus excluding other maltreated and poor children whose families do not receive or qualify for TANF.

Finally, despite empirical support for a correlational relationship between income and maltreatment, the evidence base has not established causality (Berger & Waldfogel, 2011). Causal claims are limited because available literature relies on studies with observational, retrospective, or cross-sectional data, with samples of families already at risk or experiencing poverty or child maltreatment (Berger & Waldfogel, 2011). A related problem is the lack of rigorous designs among the reviewed studies. Although the longitudinal nature of the studies is a strength, there are other design limitations related to missing data, the lack of comparison groups, and statistical approach. Most of the studies do not address the issue of missing data and how or if missing data was handled (e.g., Fein & Lee, 2003). Depending on the imputation approach, missing data can bias results and reduce the power of the findings, otherwise known as the precision of the results (Little, 2013). In addition, most of the studies conducted multivariate regression analyses (e.g., Courtney et al., 2005; Dworsky et al., 2007), instead of using more sophisticated analyses that may better answer the research questions at hand. Unlike regression-based analyses, Newland and colleagues (2013) conducted SEM, which easily handles missing

data through FIML or multiple imputation (MI), corrects measurement and random error, and offers flexibility regarding multiple dependent variables (Little, 2013).

The Present Study

The methods and findings presented in this systematic literature review highlight gaps in the literature and avenues for future exploration. As described in the summary, these limitations are related to the use of low-income, convenience samples (Epstein, 2001; Fein & Lee, 2003), the limited inclusion or summation of material hardship, the use of one or two dichotomous indicators to capture each variable of interest, and regression-based analyses, with the exception of two of the studies (Newland et al., 2013; Yeung et al., 2002).

In response, this dissertation research seeks to address these limitations by proposing a comprehensive, latent construct model of the relationship between economic conditions and risk for child physical abuse, as mediated by parenting stress, depression, and domestic violence. This study uses a full panel model of mediation with a national, population-based longitudinal dataset over three waves of data. The research questions are as follows:

1) Are the constructs underlying the proposed model (economic state, housing hardship, bill-paying hardship, health hardship, food hardship, depression, parenting stress, domestic violence, risk for child physical abuse) invariant over time?

    a. Hypothesis 1.1: The constructs underlying the proposal model (economic state, housing hardship, bill-paying hardship, health hardship, food hardship, depression, parenting stress, domestic violence, risk for child physical abuse) are invariant over time.

2) To what extent is the effect of economic conditions (economic state, housing hardship, bill-paying hardship, health hardship, food hardship) on risk for child physical abuse mediated by parenting stress, depression and domestic violence?

a. Hypothesis 2.1: Parenting stress, depression and domestic violence fully mediate the relationship between economic conditions and risk for child physical abuse.

3) What are the strongest economic predictors (housing hardship, economic state, bill-paying hardship, health hardship, food hardship) of risk for child physical abuse over time, as mediated by parenting stress, depression and domestic violence?

a. Hypothesis 3.1: Consistent with the literature, housing hardship and food hardship are the strongest predictors of risk for child physical abuse over time, as mediated by parenting stress, depression and domestic violence.

Chapter IV: Methodology

Design

This dissertation research uses the Fragile Families and Child Well-being Study (FFCWS), a longitudinal, population-based secondary dataset, to examine the relationship between child physical abuse and the family's economic conditions, as mediated by parenting stress, depression, and domestic violence. Given that the research questions seek information about changes over time and the mediating effects of parenting stress, depression and domestic violence, a longitudinal dataset is most appropriate for this dissertation inquiry. Although data were collected on both mothers and fathers, this dissertation research focuses on mothers' interviews.

The FFCWS is a national, ongoing longitudinal study currently in its sixth wave (year 15) of data collection. This study utilized stratified random sampling procedures to gather data from a 1998-2000 birth cohort of unwed and married parents about their life circumstances and their children's wellbeing at birth (baseline) and years 1, 3, 5, and 9 (Reichmann, Teitler, Garfinkel, & McLanahan, 2001). The FFCWS was designed for the purpose of informing policymakers and community leaders about non-marital childrearing, the role of fathers, and the effects of welfare reform. The FFCWS proposed three guiding research questions: 1) What are the capabilities of unmarried parents when their child is born, especially fathers? 2) What is the nature of relationships in fragile families at birth? How do relationships change over time? 3) How do parents and children fare in fragile families? (McLanahan, n.d., p. 4).

For the purpose of this dissertation research, only data from biological mothers with primary custody (defined as 50% or more) of their children were included in the analyses. This yielded a study sample of 4,845. This inclusion decision is consistent with the overall goals of this study in that this dissertation research seeks to establish the indirect effects of economic

conditions on the risk for child physical abuse. These indirect effects are difficult to ascertain if the child does not reside in the mother's home (*n*=64 at year 3). In addition, although data are available from birth fathers and mothers' current partners, the data tend to be more complete for mothers. During year 9, for example, only 59% of fathers completed the home visit survey (*n*=2,652) as compared with 76% of mothers (*n*=3,515).

Data Collection

   Sample and procedure. The FFCWS's sampling plan drew participants from U.S. cities with populations of 200,000 or more in three stages: First, the researchers identified 20 of 77 cities via stratified random sampling procedures; second, the researchers targeted hospitals within the cities that represented non-marital births for that particular city; and third, the researchers focused on births within the hospitals based on random sampling procedure to achieve specified quotas (Reichman et al., 2001). For cities with more than five hospitals, researchers randomly selected hospitals with 1,000 or more non-marital births per year. Parents were excluded from the study if the mother planned to place the child for adoption, the father was not alive, the parents did not speak sufficient Spanish or English, or the mother or child was too ill to complete the survey.

   Of the nearly 5,000 families sampled in the original FFCWS study, families with unmarried fathers and mothers were oversampled (*n*=3,600), while families of married fathers and mothers were under-sampled (*n*=1,100). Of the participating families at baseline, 87% of the respondents were born in the U.S., and 59% had a high school diploma. In addition, more than half (57%) of the parents were young (ages 18-24), with 32% of the parents ages 25-34, 5% of the parents were less than 18 years of age, and 6% were 35 years of age and older. Although the age, educational, and U. S. born characteristics of FFCWS respondents are similar to the general U. S. population, the FFCWS sample contains a higher percentage of Blacks (69%) than is

recorded for the U. S. population (32%), a lesser percentage of Whites (8%) than in the general

U. S. population (40%), and a lesser percentage of Hispanics (19%) than in the U. S. population

(24%).

After receiving approval from the Institutional Review Board at Columbia University and

Princeton University and obtaining verbal and written consent from participants, researchers

interviewed mothers and fathers in hospitals at the time of birth. Researchers then conducted

follow-up interviews when the child reached 1, 3, 5, and 9 years of age. Baseline and follow-up

interviews sought information on prenatal care; relationships between the mother and father and

between the parent and child; expectations for fathers; attitudes regarding marriage; access to

healthcare, childcare, welfare services, and child welfare agencies; social support; knowledge of

community resources; and education, employment, and income (Reichman et al., 2001).

Respondents were compensated for their participation. The Committee on the Protection of

Human Subjects, the University of Kansas's institutional review board, granted approval to

conduct secondary data analyses with the FFCWS's de-identified data for this dissertation study.

The FFCWS study retained 90% of mothers from baseline to year one, 88% from

baseline to year 3, 87% from baseline to year 5, and 76% from baseline to year 9. A subsample

of the mothers was selected for follow-up interviews at year 3 (*n*=3,356), and subsequent in-

home assessments, at which time proxies of child physical abuse were asked.

Measures

The following sections describe the measures used to investigate the economic conditions

on risk for child physical abuse, as mediated by parenting stress, depression and domestic

violence. Whenever possible, measures were selected based on their validity, reliability, and

consistency with the literature. Several of the economic constructs, such as housing hardship, do

not have measures with established validity and reliability. In these instances, indicators were

chosen based on their adherence to the literature on material hardship. These measures are grouped by each construct being investigated, including Economic State, Housing Hardship, Bill-paying Hardship, Food Hardship, Health hardship, Risk for Child Physical Abuse, Parenting, Depression, and Domestic Violence. A complete listing of the indicators chosen and the parcels can be found in Appendix B: Table 9.

Economic state. As indicated in Table 9, a family's economic state is comprised of five indicators related to a family's economic circumstances. The indicators of economic state that are included in this study are measured at years 3, 5, and 9. The first indicator is a computed ratio of the family's household income to poverty threshold, in accordance with U. S. poverty guidelines. Several binary indicators refer to a family's receipt of governmental assistance, including food stamps, supplemental security income, and other, e.g., unemployment benefits.

Material hardship. To date, the literature underscores the lack of consensus on how to measure material hardship (see Ouellette et al., 2004). Heflin and colleagues' (2009), in perhaps the most detailed confirmatory factor analyses on the four primary types of material hardships, i.e., housing, bill-paying, food, and health, recommend measuring the four types as separate latent variables instead of combining the four hardships into an overarching material hardship category. Consequently, these four hardships are separated for measurement purposes.

Housing hardship. The eight indicators of housing hardship are measured during in-home interviews during waves 3, 5, and 9. Interviewers who visited the home observed the exterior and interior home environment for the presence of mice, broken windows, exposed wires, and open cracks and holes on the ceilings, walls and floors. Although these indicators are consistent with literature on material hardship, there is no information available on the reliability or validity of these indicators, which is a limitation (Ouellette et al., 2004). See Table 9 for information on parceling.

Bill-paying hardship. The seven self-reported binary indicators of bill-paying hardship are measured during the core interviews during waves 3, 5, and 9. The first and second indicators pertain to borrowing money or moving in with friends and family because of money concerns in the last 12 months. The third and fourth indicators relate to partial or nonpayment of utilities, and rent or mortgage during the last 12 months. Disconnected utility and phone services within the last 12 months comprise the fifth and sixth indicators. The final indicator asks whether families were evicted due to nonpayment within the last 12 months. The FFCWS drew these questions from the Survey on Income and Program Participation (SIPP, 1998) and the Social Indicators Survey (SIS; SIS Center, 1999). No information is available pertaining to the reliability or validity of these indicators (Ouellette et al., 2004).

Food hardship. There are seven self-reported indicators of food hardship. Only one binary indicator, i.e., the receipt of free food or meals within the last 12 months, is measured during waves 3, 5, and 9. This indicator is derived from the SIS (SIS Center, 1999). The other six indicators are measured during waves 3 and 5. The next three indicators pertain to how often adults and children cut portion sizes or skip meals because of finances within the last 12 months. The fourth and fifth binary indicators consider whether families eat balanced or low-cost meals because of finances within the past 12 months. The last binary indicator asks whether families' food supply lasts the entire month because of finances within the last 12 months. These indicators come from the 18-item U. S.'s Department of Agricultures' (USDA) Household Food Security Scale, a widely used tool with established reliability and validity (Bickel, Nord, Price, Hamilton, & Cook, 2000). The scale performed well in tests of reliability, with values of .86 to .93 for Spearman-Brown, Rulon's split-half reliability estimates, and Cronbach's alpha (Carlson, Andrews, & Bickel, 1998). Further, among households with children, the tool demonstrated adequate content validity (R=.38 to .78) and construct validity (Hamilton et al., 1997). Regarding

construct validity, 70.7% of families with incomes ranging from 0 to 100% of the federal poverty line experienced some type of food insecurity, with 26.4% of those experiencing evident hunger. Likewise, a majority of families who often do not have enough to eat reported some form of food insecurity (84.2%) and evident hunger (55.2%) (Hamilton et al., 1997).

Health hardship. The two self-reported binary indicators of health hardship are measured during waves 3, 5, and 9. The first and last indicators concern whether anyone in the family lacked access to private health insurance or Medicaid or Medicare in the last 12 months. These two indicators are generated from the FFCWS. As with most other indicators of material hardship, information related to validity and reliability is not available.

Risk for child physical abuse. The eight indicators of this outcome variable are measured during waves 3, 5, and 9. Three categories comprise the eight indicators, including the presence and frequency of spanking, maternal physical aggression, and reports of child physical abuse to CPS as reported by mothers.

Spanking. The six self-reported categorical indicators of spanking were assessed at waves 3, 5, and 9. These indicators pertain to whether the mother, father, and current partner spanked the child during the last month and how frequently these caregivers spanked the child.

Physical aggression. The categorical indicators of physical aggression come from an adapted version of the Parent-Child Conflict Tactics Scale (CTS-PC; Straus, Hamby, Finkelhor, & Moore, 1998). During waves 3, 5, and 9, biological mothers reported their behaviors regarding five items from the CTS-PC, i.e., frequency of spanking, hitting, slapping, pinching, and shaking the focal child. Higher scores indicate more frequent aggressive parenting practices.

The CTS-PC measures psychological aggression, physical aggression, severe physical abuse, neglect, and nonviolent discipline, regardless of whether the child incurred injuries (Straus et al., 1998). For the category of physical aggression, Straus and colleagues (1998)

reported moderate internal consistency reliability (α =.55). The results demonstrate support for construct validity, given the small to medium partial correlations between the scales of nonviolent discipline, physical aggression, severe physical assault, psychological aggression, and severe psychological aggression (r=.23 to r=.56), which are consistent with previous results. One limitation is that information about other forms of validity and reliability are not available (Straus et al., 1998).

CPS reports of child physical abuse. Respondents only completed this self-report item during two time periods. During waves five and nine, biological mothers were asked whether CPS ever investigated a report of child physical abuse.

Mediators. Parenting stress, depression, and experiences of domestic violence comprise the 19 indicators of this mediating latent variable.

Parenting stress. The four categorical indicators of parenting stress come from the Panel Study of Income Dynamics-Child Development Supplement and are measured during waves 3, 5, and 9 (Hofferth, Davis-Kean, Davis, & Finkelstein, 1997). The FFCWS' four-point Likert indicators relate to finding parenting difficult, feeling trapped by parenting responsibilities, and feeling tired from childrearing, ranging from strongly agree to strongly disagree. The original scale employs nine 5-point Likert items to assess the effects of economic changes on levels of parenting stress, with responses ranging from not true to completely true. The original scale demonstrated adequate internal consistency (Cronbach's α= 0.73 – 0.80) (Courtney, Dworsky, Lee, & Raap, 2009; Courtney et al., 2005). Further, the scale had adequate predictive validity, with parenting stress increasing the risk of subsequent CPS investigations (hazard ratio = 1.04, p<0.01) among TANF applicants in Wisconsin (Courtney et al., 2005). Other information pertaining to validity is not available.

Depression. One computed binary variable is used to determine whether respondents are depressed. The computed variable is based on 13 categorical indicators of depression from Section A of the Composite International Diagnostic Interview-Short Form (CIDI-SF; Kessler et al., 1998). Once answers to the 13 items were collected, FFCWS researchers determined whether respondents met screening criteria for a major depressive episode as consistent with DSM-IV criteria, which is to experience two weeks of dysphoric mood or anhedonia (FFCWS, 2006). The 13 indicators were collected during years 3, 5, and 9.

The CIDI-SF is a standardized instrument that measures mental health in epidemiological and cross-cultural research studies. The questions relate to feelings of depression or an inability to enjoy normally pleasurable activities that lasted two weeks or longer during the past year. Specifically, the items ask respondents about weight changes; feelings of tiredness and worthlessness; ability to sleep and concentrate; and thoughts about death. The CIDI-SF demonstrated test-retest reliability (κ=.50 - .80), internal consistency (α =.89), content validity, and face validity among a sample of healthcare workers in Italy (Gigantesco & Morosini, 2008).

Domestic violence. The fourteen self-reported indicators of domestic violence in the FFCWS are derived from the Multidimensional Support Scales (MDSS), FFCWS, and Susan Lloyd's Effects of Violence on Work & Family Project. Each mother completed 3-point Likert questions referencing her current partner and the child's father. The indicators relate to physical harm, insults and criticisms, and attempts to distance the mother, withholding money and sex. One limitation of these measures is that information on the validity and reliability of these indicators is not available.

Data Analysis

The final mediation model contains eight constructs and 23 to 27 indicators per wave for a total of 24 constructs and 76 indicators over three waves of data.[4] To answer the research questions, longitudinal confirmatory factor analyses (CFA) and longitudinal structural equation models (SEM) were used across years 3, 5, and 9 (see Figure 2). SEM offers multiple advantages when compared to classical statistical models (multiple regression), including flexible approaches to data analysis, the estimation of the true population parameters, and the capacity to conduct in-depth theoretical inquires (Little, 2013; Tomarken & Waller, 2005). Another strength is SEM's estimation of measurement models and structural models, that is, the relationships between the selected constructs and their indicators, and between all of the constructs, which helps correct for measurement error and other sources of variance (Little, 2013). Related benefits correspond to SEM's ability to estimate complex models with multiple dependent variables and to measure the stability of the measures over time and to predict inter-individual differences (Little, 2013).

---

[4] The proposed mediation model had 9 constructs. The indicators of *health hardship* were added to the *economic state* construct in the final mediation model, leaving 8 constructs.

Figure 2. The proposed structural model.
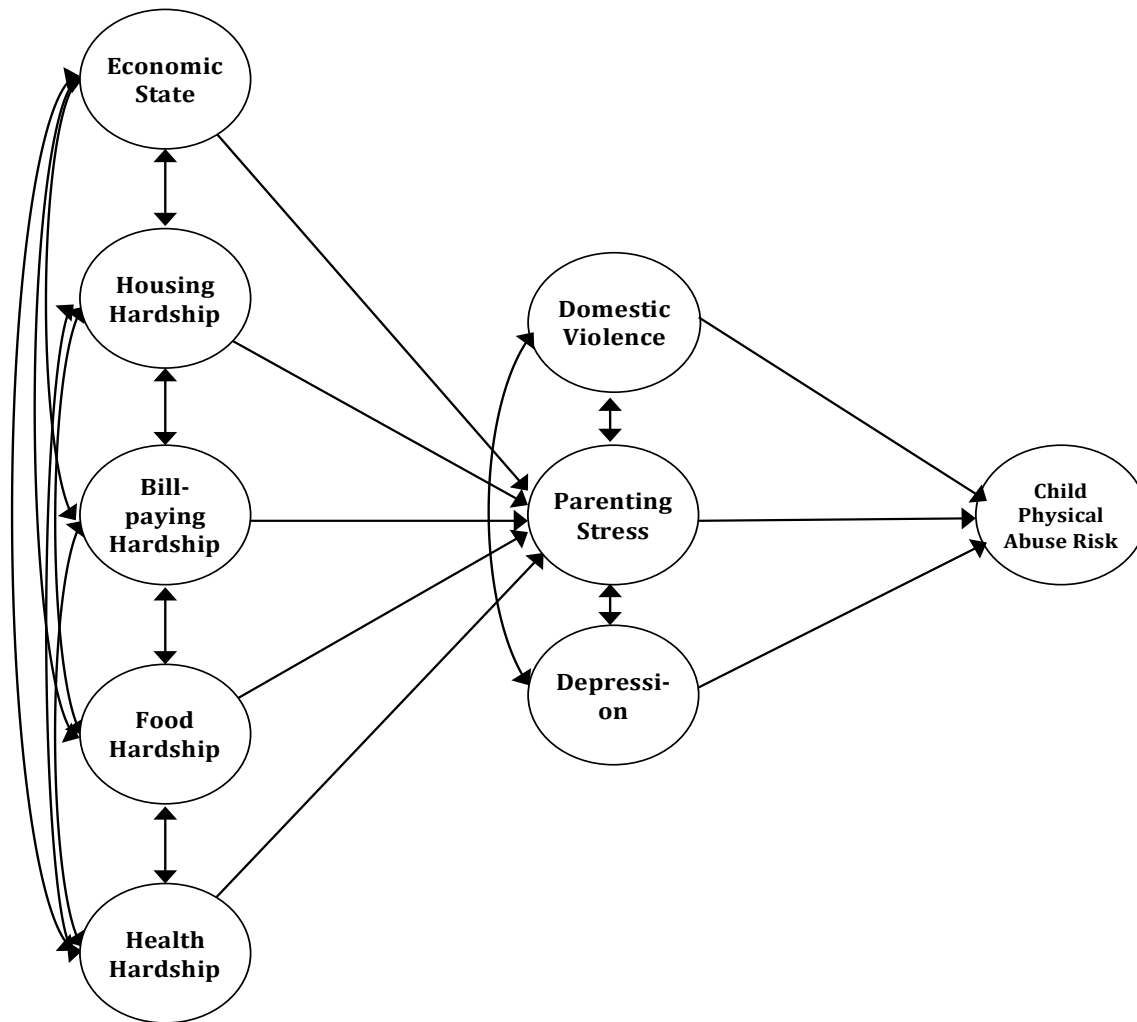
Given the objective of this dissertation study to explore mediation, longitudinal analyses are selected instead of cross-sectional approaches because establishing mediation requires the temporal ordering of the exogenous, mediating, and endogenous constructs (Cole & Maxwell, 2003; Little, 2013). Before analyzing the data, the variables were screened and parceled using the R package lavaan 0.4-14 (Rosseel, 2012). Missing data were handled through multiple imputation estimations in the R package Amelia 1.7.3 (Honaker, King, & Blackwell, 2015). After conducting the confirmatory factor analyses (CFA), a full longitudinal panel model of mediation was conducted in the R package semTools 0.4-6 (Pornprasertmanit et al., 2015).

Data screening and preparation. After importing the data into R, the missing data were handled, and examined for outliers, normality, multicollinearity and linearity, and homoscedasticity. There were no outliers. Instead of transforming highly skewed or kurtotic variables, the robust maximum likelihood (MLR) estimator was chosen to manage the ordinal and non-normal data (Little, 2013). The reader is directed to Appendix A: *Methodological Notes,* for more information about the use of MLR over DWLS, an estimator commonly used with categorical data. Unlike the traditional ML approach, which assumes data are continuous and normally distributed, MLR provides robust corrections to standard errors to account for data that are non-normal and categorical (Savalei, 2014). These corrections are important because when data are non-normal, incorrect standard errors result in confidence intervals that are too wide or too narrow, and p values cannot be trusted. Correcting the standard errors provides more accurate confidence intervals and p values, resulting in actual Type I error rates that are close to nominal α levels (Savalei, 2014). Finally, indicators were recoded in a consistent direction; in essence, smaller values indicate less of a problem (less poverty) while larger values represent more of a problem (more poverty).

Missing data. Prior to screening data for normality, linearity, and homoscedasticity, missing data were examined for the amount and type of missing data. Missing data take one of three forms: Missing Completely at Random (MCAR), Missing at Random (MAR), and Non-random Missing (MNAR) (Little, 2013). Although the causes of MCAR data are not knowable, MAR data may be related to variables in the dataset and MNAR data are directly related to observed variables. Both MCAR and MAR data are recoverable if the missing data are not related to an observed variable (e.g., education level) or if the relationship between the missing values and observed values are controlled. Although statistical approaches cannot determine whether missing data are MCAR, we can assume that missing data are MAR (Gelman & Hill,

2007). Since the missing data are recoverable, multiple imputation (MI) created 20 imputed datasets before data analysis using the R package Amelia 1.7.3 (Honaker, King, & Blackwell, 2015).

MI is a recommended data-based imputation approach when working with longitudinal data, which often results in large amounts of missing data. The MI algorithm in Amelia 1.7.3 (Honaker et al., 2015) relies on the expectation maximization (EM) algorithm to predict participants' missing values from their own observed values, which preserves that amount of variability in the imputed data (Schafer & Graham, 2002). Further, using multiple imputed values takes into account the uncertainty about what would have been observed by estimating a sampling distribution of plausible values, so that standard errors can include that additional uncertainty of parameter estimates.

Although larger amounts of missing data and higher levels of fraction missing may require more than 20 imputations, this proved unwieldy given the complex and large secondary dataset across three waves of data. Fraction missing serves as an index of the recoverability of missing data for each variable, that is, the proportion of missing data due to the mechanisms of missing data (Little, 2013). Values range from 0 to 1, in which lower values indicate less fraction missing. When variables are highly correlated, fraction missing values are smaller and data are more recoverable. The use of MI decreases bias from missing data, increases power, and represents the population more so than un-imputed data. In the final mediation model, fraction missing values ranged from .00 to .94, indicating that missing values account for 0% to 94% of the uncertainty regarding the true population values. Without missing data, standard errors would be 0% to 94% smaller. Even with a large proportion of missing data, nearly 300 observations of the 4897 participants remain (Table 8, Appendix B).

Data screening. Prior to data analysis, the data were examined for normality, linearity and multicollinearity, homoscedasticity, and outliers (Tabachnick & Fidell, 2007). Although the variables exhibited no multicollinearity or outliers, there were several violations of multivariate normality, linearity, and homoscedasticity. Given these limitations, the MLR estimator was used to conduct the analyses. The section on *Data Screening and Preparation* discusses the advantages of MLR. The data screening procedures and associated tables are detailed in the *Methodological Notes* section of this dissertation document (Appendix A).

Variable transformations. Seven variables were mean-centered and rescaled to increase the comparability among the scales and to handle the single-item constructs, including *freefood* (receipt of free food) at year 9, and *dep* (depression) at all time points. *Povratio* (income-to-poverty ratio), for example, was re-centered because its variance was substantially larger than the other indicators within the economic state construct. Changing the metric of the variables rescales the original scores, but does not change the distribution of the variables (Little, 2013). Further, analyses converge more easily when the metrics are more similar than different.

The constructs of depression during all waves and food hardship at year 9 received z-score transformations to fix their factor variance to "1" in every imputed dataset. These transformations were necessary to manually account for the residual variance of each construct, which is estimated automatically in constructs with two or more indicators (Little, 2013). Reliability estimates from prior studies were used to establish the residual variance of these indicators. In both constructs, the residual variance was calculated by subtracting the reliability information from one (1). The depression construct's residual variance is .11 (1 minus Cronbach's α=.89) (Gigantesco et al., 2008). For food hardship, a conservative estimate of Cronbach's alpha (.86) established the residual variance as .14 (Carlson et al., 1998).

Longitudinal confirmatory factor analysis. The longitudinal confirmatory factor analyses (CFA) address two purposes in this analysis. One purpose is to answer the first research question, which explores whether the constructs are invariant across time. The second purpose is to establish the strong or partial strong factorial invariance needed to test the proposed structural models. Overall, the goals of testing longitudinal CFA in this dissertation research are to determine whether 1) the constructs have factorial invariance over time; 2) the constructs have longitudinal stability; 3) a baseline model can be established for the subsequent structural models (Little, 2013).

Before establishing measurement invariance, all feasible indicators were parceled to increase the parsimony of the model (see Table 9 for a list of variables and parcels). Parceling is a strategy to reduce the number of indicators per construct by averaging or summing the items into a reliable indicator (Little, 2013). Indeed, three indicators per construct are recommended so that a model is *just-identified*, in that the known covariances and variances are equal to the parameters to be estimated (Little, 2013). Other advantages of parceling include increased model parsimony, fewer correlated residuals and dual loadings, reduced sampling error, and higher reliability and communality. To create parcels in this model, a balancing approach was used. The balancing approach combines indicators of higher loadings with indicators of smaller loadings until all indicators have been assigned to a parcel (Little, 2013).

After parceling variables, tests of measurement invariance, i.e., configural, weak and strong, were conducted across time using the fixed factor method of scale setting. The fixed factor method of scale setting fixes the latent construct variance to "1" and the latent construct mean to "0". The fixed factors method is recommended when constructs are not measured in the same metric. At the level of configural invariance with longitudinal data, parameters are allowed to freely estimate and residuals are correlated across time; weak factorial invariance constrains

relative factor loadings across time and frees latent variances at years 5 and 9 after imposing the conditions of configural invariance; in addition to the conditions of the weak invariance model, the strong factorial invariance model equates the indicator intercepts across time and frees the latent means at years 5 and 9 (Little, 2013).

Currently there is little guidance for assessing model fit in longitudinal models (Little, 2013). To assess whether the model meets conditions for configural, weak, and strong factorial invariance, the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI) and change in CFI between the nested models were examined. The RMSEA is an absolute fit index, which compares the predicted model with a perfect or saturated model and calculates the amount of misfit per degrees of freedom. Values ranging from .00 to .08 indicate exact to acceptable fit, while any value greater than .08 is mediocre to poor. Although the chi-square difference testing and RMSEA values are reported for all models, they are not reliable measures of fit for longitudinal models (Little, 2013). The CFI is a reliable and commonly used relative fit index because of its sensitivity to model misspecification, but not to sample size (Cheung & Rensvold, 2002). Acceptable values of the CFI range from .90 (acceptable) to 1.00 (exact fit). Any value below .90 represents mediocre to poor fit. Using Cheung and Rensvold's (2002) recommendations, this study adopts the .01 criteria to determine whether the change in CFI is within acceptable limits. Given the exploratory nature of this study, the CFI and change in CFI values are considered guidelines open to interpretation. After examining this fit index, tolerance information will be examined (i.e., standard errors) (Little, 2013). Standard errors that lack uniformity across the model parameters can indicate local misfit.

Longitudinal structural equation modeling. Once achieving strong invariance, SEM analyses with Monte Carlo estimation of the direct and indirect effectswere conducted to answer the second and third research questions (MacKinnon, Lockwood, & Williams, 2004). The goals

of SEM are to ascertain 1) the constructs' direct and indirect effects over time; 2) whether cross-lagged effects exist among the constructs over time; and 3) whether modifications are needed to improve the proposed model (Little, 2013). To test the second and third research questions, a full longitudinal model of mediation was needed. Figure 3 illustrates the proposed cross-lagged model. In this proposed longitudinal model of mediation, the predictor variables (i.e., economic state, housing hardship, health hardship, food hardship, bill-paying hardship), the mediator variables (i.e., parenting stress, domestic violence, depression), and outcome variable (risk for child physical abuse) are each measured across years 3, 5, and 9.

Little (2013) outlines several steps that are needed to test mediation. The first step requires that strong or partial strong invariance be established. The next step tests the hypothesis of the longitudinal mediation model, which involves calculating the indirect effects and using only cross-lagged paths associated with mediation. Once complete, subsequent steps are to examine the pathways for statistical significance at $p<.005$ and estimate the final model.

Figure 3. Final full longitudinal panel model of mediation.
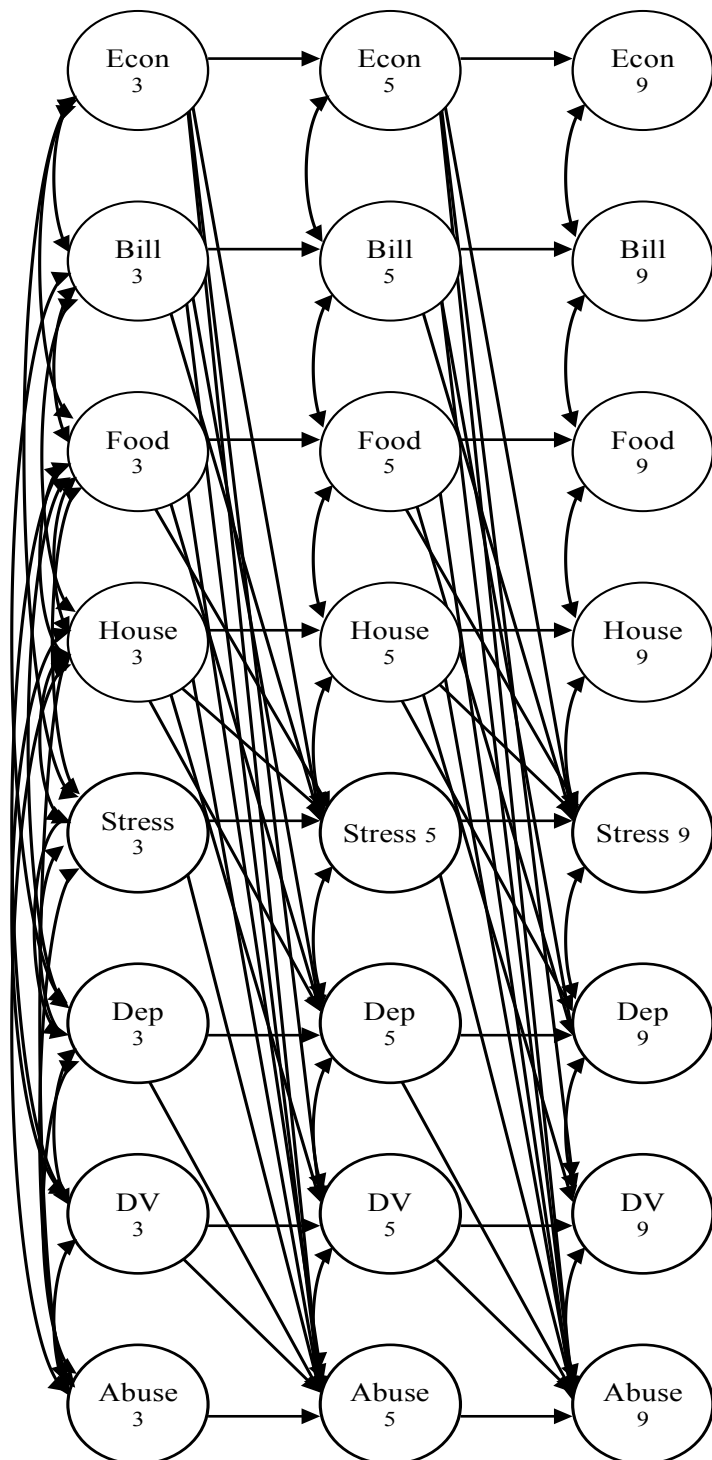
Note. The constructs are measured across year 3, 5, and 9, and include economic state (Econ) and bill-paying hardship (Bill), food hardship (Food), housing hardship (House), parenting stress (Stress), depression (Dep), domestic violence (DV), and risk for child physical abuse (Abuse).

Because mediation is a causal hypothesis about the nature of change, a cross-lagged model was used (Cole & Maxwell, 2003). Cross-lagged models control for prior measurements of the mediator and outcome variable, which is why at least three time points are needed to estimate indirect pathways across two times of measurement, i.e., full mediation models (Little, 2013). In addition, the proposed model included lagged predictor-to-outcome effects and correlated residuals at each occasion of measurement (see Figure 3). Allowing lagged residuals to correlate with each other accounts for the method variance that they share.

After establishing the final mediation model, Monte Carlo estimation was used to test the significance of the indirect and total effects. Monte Carlo estimation was selected given the use of secondary data and the size and complexity of the proposed model (Little, 2013). Monte Carlo estimation takes the parameter estimates and standard errors to randomly draw from the *a* and *b* pathways (Preacher & Selig, 2012). The *a* pathway is the relationship between the economic predictors and the mediators, while the *b* pathway is the relationship between the mediators and the outcome variables. Distributions of these pathways were simulated to compute the *ab* product (Selig & Preacher, 2008). After repeating this procedure many times, the *ab* distribution was used to estimate a confidence interval around the *ab* value with a *p* value of .005. Then, a null hypothesis of no mediation was conducted. If the null hypothesis value falls outside the *ab* distribution, the null hypothesis is rejected, which provides evidence in favor of mediation.

Chapter V: Results

In this section, descriptive statistics of the sample are presented first. Results from the confirmatory factor analyses (CFA) answer the first research question, while the results from the final full panel model of mediation answer the second and third research questions.

Sample Characteristics

Nearly 5,000 biological mothers with primary custody of their children (*n*=4,789) participated in the FFCWS study. Primarily, mothers were young, with 63.14% ranging from 15 to 26 years of age, and ethnically diverse, with 49.70% reporting as Black and 27.43% reporting their ethnicity as Latina. At baseline, mothers reported lower incomes (*M*=$31,990, *SD*=$31,567), with a third of participants (36.16%) residing in extreme poverty (0-49% of the federal poverty level [FPL]) or moderate poverty (0-99% FPL) (see Table 1). A majority of mothers were romantically involved with the biological father (82.73%) and had low educational attainment, with 59.74% completing some high school or graduating from high school. See Table 1 for more information. The reader is directed to Table 7 (Appendix B) to view the descriptive statistics of the study variables.

Table 1
Descriptive Statistics of Participants at Baseline

Indicators	N	%	*M (SD)*	Range
Income	4897	**	$31,990.00 ($31,567.17)	$0.00 - $133,800.00
Household Size	4858	**	3.58 (1.65)	1 - 9
Age	4894	**	25.28 (6.04)	15 - 43
15 - 20		26.5%		
21 - 26		36.7%		
27 - 31		19.5%		
32 +		17.3%		
Ethnicity	4807			
White		30.8%		
Black		49.7%		
Asian		02.8%		
American Indian		04.6%		
Other		12.1%		
Latino	4860	27.4%		
Poverty	4897			
0-49% of the FPL		18.9%		
50-99% of the FPL		17.2%		
100-199% of the FPL		25.8%		
200-299% of the FPL		15.5%		
300% + of the FPL		22.6%		
Relationship w/Bio Father	4896			
Unknown Father/No Relationship		03.6%		
Friends		03.6%		
Romantic, No Cohabitation		32.1%		
Romantic, Cohabitation		36.4%		
Married		24.2%		
Education	4892			
<8th Grade		05.2%		
Some High School		29.5%		
High School Diploma/GED		30.2%		
Some College		21.2%		
Technical School		03.1%		
Bachelor Degree		07.2%		
Graduate School		03.5%		

Measurement Models

First research question. This question examines whether the nine constructs of

economic state, housing hardship, food hardship, health hardship, bill-paying hardship, parenting

stress, depression, domestic violence, and risk for child physical abuse underlying the proposed

model are invariant over time.[5] After the proposed measurement model proved too unwieldy to analyze as a comprehensive model, several versions of the measurement models were analyzed (see Appendix A for information on the testing on the measurement models).[6] This section details the results from the three main sets of measurement models. In the first series of CFAs, housing hardship, bill-paying hardship, food hardship and current economic state comprised the proposed model. In the second set of CFAs, a model of the mediators (parenting stress, depression and domestic violence) and the outcome variable (risk for child physical abuse) was tested. In the third, all constructs were examined for configural and weak invariance. Strong invariance could not be assessed due to indeterminate errors in R.

As illustrated in Table 2, 3, and 4 the results indicated that the proposed model was invariant over time, which supports the first research question and Hypothesis 1.1. The final strong invariance model of economic predictors, $\chi^2(438) = 890.007$, $p = 0.003$, CFI = .950, ΔCFI=.004, RMSEA = .016 (90% CI: .014-.017), the final strong invariance model of the mediators and outcome variables, $\chi^2(459) = 539.021$, $p = .377$, CFI = .980, ΔCFI=.023, RMSEA= .006 (90% CI: .004-.008), and the weak invariance model of all constructs, $\chi^2(1858) = 1797.960$, $p = .580$, CFI = .999, ΔCFI =.004, RMSEA =.001 (90% CI: .000-.004), demonstrated acceptable fit. Although the .023 change in CFI for the model of mediator and outcome variables exceeds Cheung and Rensvold's (2002) .01 change recommendation, the change of .023 is acceptable within the context of the overall invariance findings. Further, the results from the final mediation model and revised weak invariance model indicate a good fit of the model to the data, which are discussed in the next section. These findings indicate that the measurement structure

---

[5] In the final mediation model, *economic state* absorbed the *health hardship* construct, leaving 8 constructs.

[6] Although the proposed model contains 8 constructs, the constructs of depression and health hardship during all waves, and food hardship at year 9 were not tested for invariance. Although invariance testing is not reliable for one or two-item constructs (Little, 2013), these constructs were included in the SEM analyses.

of these models does not differ between the three waves of data given that strong invariance (equated factor loadings and item intercepts) held over time for the models of economic predictors and the mediators and outcome variable, and weak invariance (equated factor loadings) held over time for the comprehensive model.

Table 2
Economic Predictors: Model Fit for Testing Longitudinal Invariance

Model	χ2	df	*p*	RMSEA (90% CI)	CFI	Δχ2	df	*p*	ΔCFI
Configural Invariance	834.423	410	.000	.015 (.014-.017)	0.956	--	--	--	--
Weak Invariance	935.786	424	.000	0.016 (.013-.018)	0.946	-101.363	14	.001	-.010
Strong Invariance	890.007	438	.003	.016 (.014-.017)	0.950	45.779	14	1.000	.004

Table 3
Parenting Stress, Domestic Violence and Risk for Child Physical Abuse: Model Fit for Testing Longitudinal Invariance

Model	χ2	df	*p*	RMSEA (90% CI)	CFI	Δχ2	df	*p*	ΔCFI
Configural Invariance	561.693	429	.234	.008 (.007-.010)	.974	--	--	--	--
Weak Invariance	674.610	444	.116	.011 (.009-.012)	.957	112.917	15	<.001	-.017
Strong Invariance	539.021	459	.377	.006 (.004-.008)	.980	-135.589	15	1.000	.023

Table 4
Final Model Fit for Testing Longitudinal Invariance

Model	χ2	df	*p*	RMSEA (90% CI)	CFI	Δχ2	df	*p*	ΔCFI
Configural Invariance	1838.298	1829	.531	.003 (.000-.004)	0.995	--	--	--	--
Weak Invariance	1797.960	1858	.580	.001 (.000-.004)	0.999	40.338	29	1.000	.004
Mediation Model (*Health Hardship*)	0.000	2612	1.000	0.001 (.001-.007)	1.000	--	--	--	--
Final Mediation (no *Health Hardship*)	3138.194	2648	.340	.007 (.006-.008)	0.972	--	--	--	--

Note. For both the proposed mediation model with health hardship as its own construct and the final mediation model (health hardship combined with economic state), the $\Delta\chi^2$ and the ΔCFI testing were conducted only for the proposed weak invariance model. The weak and strong invariance models based on the final mediation model did not converge. Likewise, the proposed strong invariance model did not converge.

Structural Models

Second research question. This question asks to what extent is the effect of economic conditions (housing hardship, bill-paying hardship, economic state, health hardship, food hardship) on risk for child physical abuse mediated by parenting stress, depression and domestic violence. The corresponding Hypothesis 2.1 predicted that parenting stress, depression and domestic violence fully mediates the relationship between economic conditions and risk for child physical abuse. To answer this research question, a full panel model of mediation was conducted over three time points (Cole & Maxwell, 2003; Little, 2013). With the strong invariance model as the foundation, the mediation model estimated within-time factor covariances, autoregressive paths, and cross-lagged paths from predictors to mediators and mediators to the outcome variable at years 3, 5 and 9. Although the findings indicated a good fit of the model to the data, $\chi^2(2612)$ =.000, p = 1.000, CFI = 1.000, RMSEA = 0.001 (90% CI: .001-.007), the regression pathways between selected variables (economic state or health hardship predicting depression or parenting stress) exceeded 1.00^7, signifying concerns with the specification of the mediation model. Standardized coefficient values should range from 0 to 1 (Keith, 2006). Upon investigation, the within-time correlations were very large between economic state and health hardship (year 3 r=.98, year 5 r=.94, year 9 r=.80), suggesting a problem of multicollinearity. The issue of multicollinearity is theoretically sound when considering the impact of a family's financial situation (economic state construct) on their ability to afford health insurance (health hardship indicators). Given this strong association, the mediation model was re-analyzed after adding the two health hardship indicators to the economic state construct. The model fit was acceptable,

---

[7] depression (5)~economic state (3) (β=9.71), depression (5)~health hardship (3) (β=8.98), depression (5)~bill-paying hardship (3) (β=-1.38), depression (9)~economic state (5) (β=2.51), depression (9)~health hardship (5) (β=-2.27), parenting stress (9)~economic state (5) (β=2.08), parenting stress (9)~health hardship (5) (β=-1.88).

$\chi^2(2648) = 3138.194$, $p = .340$, CFI = .972, RMSEA = .007 (90% CI: .006-.008), with the

standardized coefficients ranging from 0 to 1 (see Table 4).

As indicated in Table 5, Hypothesis 2.1 is not supported. The results from the Monte

Carlo estimations demonstrated that none of the indirect relationships were statistically

significant at p value of .005. Given the lack of statistical significance, the indirect relationships

also were examined with a p value of .05. Only one indirect relationship was significant at this

level: Maternal depression at year 5 significantly mediated the relationship between food

hardship at year 3 and risk for child physical abuse at year 9 (β=.007, $p<0.05$) (see Table 5). In

contrast, maternal depression, parenting stress and domestic violence did not significantly

mediate the relationship between all other economic predictors and risk for child physical abuse.

Table 5

Indirect Effects of the Final Mediation Model

Parameter	B	SE	β
Risk for child physical abuse (9)~domestic violence (5)~economic state (3)	-.002	.002	-.002
Risk for child physical abuse (9)~depression (5)~economic state (3)	-.001	.001	-.001
Risk for child physical abuse (9)~parenting stress (5)~economic state (3)	-.003	.001	-.003
Risk for child physical abuse (9)~domestic violence (5)~housing hardship (3)	-.002	.002	-.002
Risk for child physical abuse (9)~depression (5)~housing hardship (3)	-.002	.001	-.002
Risk for child physical abuse (9)~parenting stress (5)~housing hardship (3)	-.001	.001	-.001
Risk for child physical abuse (9)~domestic violence (5)~bill-paying hardship (3)	-.007	.003	-.006
Risk for child physical abuse (9)~depression5~bill-paying hardship (3)	.003	.001	.003
Risk for child physical abuse (9)~parenting stress (5)~bill-paying hardship (3)	-.003	.001	-.003
Risk for child physical abuse (9)~domestic violence (5)~food hardship (3)	.002	.005	.002
Risk for child physical abuse (9)~depression (5)~food hardship (3)	.008	.002	.007
Risk for child physical abuse (9)~parenting stress (5)~food hardship (3)	.001	.002	.001

Note. None of the pathways are statistically significant at $p<.005$.

Third research question. The third research question pertains to the strongest economic

predictors of risk for child physical abuse over time, as mediated by parenting stress, depression

and domestic violence. Housing hardship and food hardship were expected to be the strongest

predictors of risk for child physical abuse over time, as mediated by parenting stress, depression

and domestic violence (Hypothesis 3.1). Contrary to expectations, there is no support for the

hypothesis. Given the lack of significant findings at $p<.005$, the significance of the results was

examined with a p value of .05. Based on the results, the strongest economic predictors were

food hardship and bill-paying hardship, with some support for economic state and little support

for housing hardship (see Table 5, 6). As specified in the above section, the relationship between

food hardship and risk for child physical abuse was mediated significantly by maternal

depression ($\beta=.007$, $p<0.05$). The lack of significant indirect relationships is influenced by the

lack of statistically significant relationships between the mediators and outcome variable. Of all

of the mediators, only depression at year 5 predicted a heightened risk for physical abuse at year

9 ($\beta=.060$, $p<0.05$) (see Table 6).

Table 6
Direct Effects of the Final Mediation Model

Parameter	B	SE	β	p
Risk for child physical abuse (year 5) ~				
Domestic violence (year 3)	.017	.037	.020	.643
Depression (year 3)	.003	.018	.003	.855
Parenting stress (year 3)	.041	.027	.047	.125
Risk for child physical abuse (year 9) ~				
Domestic violence (year 5)	-.062	.053	-.053	.240
Depression (year 5)	.072	.033	.060	.032
Parenting stress (year 5)	-.049	.040	-.044	.227
Domestic violence (year 5) ~				
Economic state (year 3)	.036	.040	.037	.365
Housing hardship (year 3)	.029	.047	.030	.541
Bill-paying hardship (year 3)	.113	.060	.120	.059
Food hardship (year 3)	-.037	.085	-.039	.661
Depression (year 5) ~				
Economic state (year 3)	-.011	.023	-.011	.632
Housing hardship (year 3)	-.025	.030	-.027	.391
Bill-paying hardship (year 3)	.042	.040	.044	.293
Food hardship (year 3)	.107	.046	.110	.020
Parenting stress (year 5)				
Economic state (year 3)	.059	.025	.060	.020
Housing hardship (year 3)	.030	.033	.029	.363
Bill-paying hardship (year 3)	.068	.034	.070	.044
Food hardship (year 3)	-.016	.044	-.016	.712
Domestic violence (year 9)				
Economic state (year 5)	-.005	.039	-.006	.891
Housing hardship (year 5)	.067	.089	.056	.451
Bill-paying hardship (year 5)	-.101	.051	-.129	.047
Food hardship (year 5)	.016	.081	.017	.845
Depression (year 9)				
Economic state (year 5)	.019	.021	.021	.362
Housing hardship (year 5)	.024	.049	.019	.629
Bill-paying hardship (year 5)	.061	.026	.070	.019
Food hardship (year 5)	.065	.035	.070	.062
Parenting stress (year 9)				
Economic state (year 5)	-.003	.023	-.003	.891
Housing hardship (year 5)	-.040	.063	-.031	.524
Bill-paying hardship (year 5)	.024	.033	.028	.469
Food hardship (year 5)	.071	.044	.070	.110

Note. None of the pathways are statistically significant
at *p*<.005.

Because the relationship between food hardship at year 5 and risk for child physical

abuse at year 9 was the only statistically significant indirect effect, the direct relationships

between the economic predictors and mediators also were examined to answer this research

question. Bill-paying hardship at year 3 increased maternal parenting stress and domestic

violence at year 5 (β= 0.070, β=0.120, respectively, *p*<.05). Unexpectedly, experiencing more

bill-paying hardship at year 5 decreased subsequent domestic violence at year 9 (β= -0.129,

$p<.05$). Concerning food hardship, there was a small, statistically significant impact of food

hardship at years 3 and 5 on increased levels of depression at year 5 and 9 (β= 0.110, β= 0.070,

respectively, $p<.05$). Finally, as mothers' economic state worsened during year 3, their parenting

stress levels increased at year 5 (β=.060, $p<0.05$). Although these effect sizes are statistically

significant at $p<.05$, these effect sizes are nearly negligible, meaning that the economic

predictors only account for 0.01% to 1.69% of the variance in the mediators, which leaves

98.31% to 99.99% variance unexplained by the relationship. These effect sizes were calculated

by squaring the standardized coefficient of each pathway.

Summary. Overall, the CFA and SEM models provide a good fit to the data,

demonstrating support for the first hypothesis. These results indicate that the proposed model is

invariant over time and adequately measures the constructs. The findings support neither the

second nor the third hypothesis. Regarding the second research question, there is no evidence of

full or partial mediation at $p<.005$. Of the 12 indirect effects, only food hardship at year 3

predicted risk for physical abuse at year 9, as mediated by maternal depression (β=.01, $p<0.05$).

Similarly, the findings do not support the third research question, which hypothesizes that food

hardship and housing hardship are the strongest predictors of risk for child physical abuse, as

mediated by parenting stress, depression and domestic violence. The findings demonstrate the

most support for the effect of food hardship on the mediators and outcome variable, some

support for the direct relationship between bill-paying hardship and the mediators, and less

support for the impact of economic conditions on the mediators.

Chapter VI: Discussion

When examining the empirical and historical literature on the relationship between economic conditions and child physical abuse, the somewhat fragmented approach to child maltreatment prevention and the lack of attention given to families' economic circumstances proved disconcerting. In response, this dissertation research sought to better understand the relationship between economic conditions and risk for child physical abuse and to identify, insofar as possible, the strongest economic conditions according to their relative contribution to risk for child physical abuse. To investigate both goals, this dissertation research explored the effect of economic conditions on risk for child physical abuse, as mediated by parenting stress, domestic violence and depression. As indicated in the findings, there is a contextual and complex relationship between economic conditions and risk for child physical abuse.

This mediation model is the first known to use an inclusive set of economic indicators to estimate their effect on and relative contribution to risk for child physical abuse. The well-fitting measurement and structural models provide the rationale for using a complex, comprehensive model. In testing this model, the findings help lessen the gap between poverty and child maltreatment prevention. In essence, the final mediation model offers several important implications for research, policy and practice, which are discussed after a summary of the findings and limitations.

Significance of Findings and Emerging Questions

The overall results of this dissertation research highlight the complexities of studying and fully understanding child physical abuse and its relationship to various economic predictors and mediators. On one hand, the well-fitting measurement and structural models provide support for a comprehensive model of the structure of economic conditions, risk for child physical abuse, parenting stress, depression, and domestic violence. These findings suggest that income and

material hardship fit within the environment of family risk, that is, risk for child physical abuse, depression, domestic violence, and parenting stress. On the other hand, the findings do not find evidence of an effect of the economic predictors on the mediators or risk for child physical abuse. Instead of clarifying the relationship between economic conditions and risk for child physical abuse, the results are overwhelmingly ambiguous: These economic and family risk factors fit well together, but share no predictive relationship.

After extensive, decades-old research on the impact of economic conditions on child maltreatment, there remains much that researchers do not know. As a field, efforts to understand the role of financial stressors on child maltreatment have not yet captured the entire relationship between economic hardship and child abuse or neglect. Take the indirect effect of food hardship on risk for child physical abuse as an example. Food hardship at year 3 had a small impact on risk for child physical abuse at year 9, as mediated by maternal depression at year 5 (β=.01, p<0.05), leaving 99.9% of the variance in this relationship unexplained. There are a few potential explanations for this finding. Although the impact is small, food hardship (year 3) predicted risk for child physical abuse (year 9) six years after the experience of food hardship. It is possible that the role of food hardship is just the tip of the iceberg for the experience of child abuse. There are other factors influencing children's risk for physical abuse during each wave of data collection and between waves of data collection that are not explained in the structural model used here or in other models used elsewhere. The statistical approaches used in the inquiry on the economic conditions of child physical abuse cannot fully account for the dynamic relationship between economic stressors and family risks. The looming question is of what researchers are missing in the equation between economic conditions and the event of child abuse.

The failure to discern the relationship between economic predictors and family risks conveys that something more, perhaps something not-yet-identified and isolated for study, is at

play in the equation. Perhaps the relationship between economic stressors and family risk is more than linear, and better comprehended as a non-linear or curvilinear relationship, or one with bi-directionality. Although there are many applications of quantitative research, quantitative research has its limitations. One consideration is that measurement is largely a static process and can only account for what variables are measured during specified waves of time. Other unidentified and unknown variables may influence the relationship between economic conditions and risk for child physical abuse. Whereas the variables studied in this dissertation are family-level variables, there may be structural variables that affect and alter the relationship between economic hardship and child abuse. What are the roles of an economic recession, and changes in the Gross Domestic Product or the cost of living in untangling the relationship between economic stressors and family risks?

Although the influence of these structural variables is unknown, qualitative inquiries may help make the influential power of these variables more evident. When examining the impact of economic stressors on risk for child physical abuse, researchers have not sought accounts of the experiences of families and of caseworkers in the fields of child maltreatment prevention or poverty prevention. Family life is a series of dynamic transactions, which might well be better captured by qualitative research.

In summary, the study findings demonstrate the usefulness of a comprehensive model of the relationship between economic conditions and risk for child physical abuse, and the need for future research. The overall literature review, statistical approach, and results raise important considerations for building on our current conceptual and empirical understanding of the relationship between economic conditions and child maltreatment.

Study Limitations

This dissertation research contains several limitations, which must be considered as the findings are reviewed. The limitations highlighted in this section pertain to the most pressing issues rather than serving as an exhaustive list. Several existing publications feature the limitations of the FFCWS dataset (Bendheim-Thoman Center, 2011; Reichman et al., 2001; Vu, 2011). The limitations of this dissertation research primarily correspond to the study's methodology, including the FFCWS dataset and variables and are presented here. Implications for research directly follow this section.

Dataset limitations. In this dissertation research, the use of a longitudinal, secondary dataset proved limiting. The FFCWS is a single-cohort design, not an intervention study with random assignment, which limits the ability to assert causality (Rubin & Babbie, 2013). A related limitation is that the FFCWS represents a subset of the general population. This means that findings from this dataset are generalizable only to non-marital births in the 20 cities with 200,000 or more residents as of 1994 (Reichman et al., 2001). This population may or may not represent all children who are physically abused or experience poor economic conditions, specifically concerning children who reside in non-urban settings, are born outside the birth cohort of 1998-1999, and do not reside with either biological parent. Although this dissertation research could not control the design of the original study, the FFCWS offered the data needed to formulate appropriate, meaningful, and theoretical constructs.

Related limitations pertain to most longitudinal studies. In addition to age cohort and measurement occasions, other threats to validity pertain to test-retest effects and attrition, i.e., participants who drop out of a study because of shared characteristics, e.g., low socioeconomic status (Little, 2013). As discussed in the methodology section, there is a significant amount of missing data in the FFCWS dataset, ranging from 0% to 94%. Even with a proportion of 94%

fraction missing values, nearly 300 observations remain, which is sufficient for conducting SEM (Little, 2013). While some of the missing data was attributed to budget constraints during the in-home interview portion of the surveys, the other sources of missing data were not explained. Of the 4,789 parents eligible for the in-home survey during wave 3, for example, only 3,288 mothers participated due to the study's budget issues (FFCWS, 2008). Although this source of this missing data was explained, no explanation was given for the 7.9% parents (n=379) who did not participate during the main wave 3 interviews, for example. Overall, nearly a quarter (24%) of participants dropped out of the study from baseline (*n*=4,789) to year 9 (*n*=3,630). The reasons for attrition are unclear. Participants may have left the study because of shared characteristics such as low education, which may bias the findings (Little, 2013). It is impossible to know how the characteristics of the excluded participants may have impacted the in-home interviews and the overall findings of the indicators collected during the in-home interviews.

There are also limitations related to the FFCWS's reliance on self-reported data. Due to stigma, secrecy and social desirability, self-reported data may underrepresent children at risk for child physical abuse and inadequate economic conditions (Fallon et al., 2010; Sedlak et al., 2010). Fallon and colleagues (2010) estimated that nearly 80% of maltreatment is not reported. Besides housing hardship, which relies on direct observations of housing conditions, self-reported data informs all other indicators of this dissertation research (Bendheim-Thoman Center, 2008). Self-reported data may not accurately reflect participants' actual thoughts, attitudes, and behaviors over time, which may underestimate the prevalence of risk for child physical abuse and the economic conditions (Nolte, Elsworth, Sinclair, & Osborne, 2012).

Finally, there are limitations related to the results of this dissertation. The first issue pertains to the small and non-significant effects of economic predictors on risk for child physical abuse as mediated by parenting stress, domestic violence and depression, while the second

concerns the use of the robust maximum likelihood (MLR) estimator. Although several of the reviewed studies considered the indirect relationship between economic conditions and risk for child physical abuse, they also examined the direct relationship between economic conditions and risk for child physical abuse (Dworsky et al., 2007; Yang, 2012). This dissertation research did not examine the direct effects of the economic predictors on risk for child physical abuse based on the guidance of the family stress model (Conger et al., 1992) and constraints of the dataset.[8] Given these differences, there is a possibility that the relationship between the economic predictors and risk for child physical abuse share direct associations in addition to the indirect ones. The non-significant findings also may be due to time lags between periods of data collection. It is possible that the effect of a bill-paying hardship at year 3 lessened at years 5 and 9, when the mediators and outcome variables were collected, respectively. This may be true especially if families substantially improved their finances over the six years between data collection.

There are also limitations regarding the use of MLR. Prior to analyzing the data, the MLR estimator was selected instead of the maximum likelihood (ML) estimator because of the categorical and non-normal data in this dissertation study. Unlike MLR, ML assumes that data are continuous and normal, which often affects the reliability of the chi-square values and robustness of the standard errors (Savalei, 2014). In this dissertation research, however, the MLR estimator negatively impacted the chi-square values and standard errors associated with the measurement and structural models. In essence, the use of MLR led to less reliable chi-square statistics and less robust standard errors. As a next step, the data from this dissertation will be re-analyzed with a ML estimator. After all, reliable and robust chi-square statistics and standard

---

[8] When direct relationships between the economic predictors and risk for child physical abuse were added to the mediation model, there were error messages related to the missing values within the imputed datasets.

errors are essential for ensuring that the confidence intervals are accurate and that the *p* values

can be trusted (Savalei, 2014).

Limitations of the variables. There are some cautions to be noted related to the

variables included in this dissertation research, which pertain to the availability of indicators in

the FFCWS. Several meaningful variables were excluded based on feasibility and their

availability. Variables related to debt, assets, clothing, unmet medical needs, and the quality,

availability and affordability of medical care were not available in the FFCWS dataset, even

though they likely contribute to a family's financial wellbeing (Beverly, 2001; Heflin, 2006,

2009; Iceland, 2005; Iceland & Bauman, 2007). For example, Conger et al. (1993) found that the

debt-to-asset ratio predicted a family's distress over their finances (economic pressure),

ultimately increasing marital conflict. In another study, Dew (2007) found that family debt

directly increased subsequent marital conflict and economic pressure, while assets directly

reduced economic pressure, similar to the parenting stress construct in this dissertation research.

Pertaining to unmet medical needs, the findings from this dissertation suggest that the

insurance indicators are not adequate indicators of health hardship, evidenced by the health

hardship variables cross-loading on economic state.[9] This relationship was not expected in this

study nor indicated in the overall literature on health hardship. Similar to the FFCWS data,

literature on health hardship typically includes the ability to visit a doctor/dentist when needed

and the receipt of Medicaid or private insurance (Ouellette et al., 2004). The dissertation results

demonstrate that these three indicators may not explain the contextual nature of health hardship.

Essentially, the mediation model fit better and the out-of bounds standardized coefficients

---

[9] *drvisit* (In the past 12 months, was there anyone in your household who needed to see a doctor or go to the hospital but couldn't go because of the cost?) is not included in the construct of *health hardship*. For more information, see Appendix A: *Methodological Notes*.

disappeared when the insurance variables were added to economic state. Similarly, Heflin (2009) suggests that having health insurance is a symptom of unmet medical needs rather than the cause of unmet medical needs. In essence, health insurance alone does not guarantee that people receive timely, affordable, or high-quality medical care.

Other variables, such as car ownership, transportation and childcare, were excluded because there were few studies examining these hardships that met the inclusion criteria of this dissertation research plan (Klein, 2011; Sidebotham, 2002). Klein (2011) reported that neighborhoods with a higher percentage of preschoolers and available childcare slots had fewer reports of child maltreatment, while Sidebotham (2002) found that families without a car were 2.33 times more likely to have subsequent reports of maltreatment. Thus, issues of transportation and childcare are vital considerations that may place stress on families.

Study Implications

Altogether, the proposed model is the first to use an inclusive set of economic indicators to estimate their effect on and relative contribution to risk for child physical abuse, as mediated by parenting stress, depression, and domestic violence. Although income and material hardship did not predict parenting stress, domestic violence, depression, or risk for child physical abuse in this study, together, the constructs form an underlying structure, as evidenced by the well-fitting model. In other words, economic and family stressors are related to each other and to risk for child physical abuse. This relationship is cohesive and all encompassing, which underscores the notion that risk for child physical abuse is a complex social problem. Such enigmatic social problems require multifaceted, sophisticated solutions beyond our current strategies for research, policy and practice. The implications of this complexity are discussed for research, policy and practice in the following sections.

Implications for research. This dissertation research tests an extensive, longitudinal model of the relationship between economic conditions and risk for child physical abuse, as mediated by depression, domestic violence, and parenting stress. The findings of this dissertation research offer implications for research regarding its theoretical contribution, sophisticated statistical approach, and impact on measurement literature.

As mentioned in the literature review, inquiries on the relationship between material hardship and child maltreatment lack a clear theoretical perspective. The family stress model is the most common theoretical approach in this area. This dissertation research contributes to the accumulating evidence in support of an adapted version of the family stress model (Conger et al., 1992; Newland et al., 2013; Yang, 2012). Building on Conger and colleagues' work (1992), this research examines an inclusive set of material hardships on risk for child physical abuse, thereby expanding the inquiry related to the relationship between economic stressors (debt-to-assets ratio) and child adjustment. Besides the family stress model, there are few other conceptual frameworks that explain how economic factors create an environment for child abuse to occur. Given the mixed support for the relationship between economic conditions and risk for child physical abuse, additional studies are needed to continue refining the family stress model.

At present, there are few studies that employ random assignment, thus there is minimal causal evidence for the relationship between income transfers and reduced maltreatment risk (Cancian et al., 2013; Fein & Lee, 2003). The temporal ordering of this dissertation research design provides additional support for the causal relationship between food hardship and risk for child physical abuse through the pathway of maternal depression. Unlike a majority of the reviewed studies, this dissertation study used latent variables and SEM. Only two other known studies used SEM (Newland et al., 2013; Yeung et al., 2002). The other 14 studies included in the literature review used regression-based analyses (e.g., Yang, 2012), which may have

oversimplified the complex relationship between economic conditions and risk for physical abuse. Unlike the latent constructs in SEM, regression-based analyses do not allow for multidimensional and contextual variables or constructs (Little, 2013).

This dissertation research used a population-based, national dataset with stratified random sampling. Rigorous experimental designs and sampling strategies are needed to substantiate the evidence for the relationship between economic conditions and risk for child physical abuse. Future studies need to use stratified or random sampling plans and to propose intervention studies with national samples. Currently, the majority of the evidence is drawn from low-income convenience samples at the state level (e.g., McDaniel & Slack, 2005).

Even though there are decades of research, the evidence concerning the relationship between economic stressors and child abuse or neglect remains elusive. There are four potential remedies to address this. The first is to conduct a meta-analysis to determine the effect sizes of the relationship between economic factors and risk for child physical abuse. This would provide a helpful starting point for understanding what evidence we have and what evidence is needed. The second strategy is to examine the economic conditions of risk for child neglect. This would help disentangle the effects of economic conditions on child physical abuse versus child neglect. As previously noted, child neglect and abuse often are included in an overall category of maltreatment, which may lead to inaccurate conclusions about the economic impact on maltreatment if neglect or abuse is more responsible for the significant findings (Belsky, 1993). If overall maltreatment or neglect is more important than physical abuse as an outcome, this may explain why there were few statistically significant findings in this dissertation. The fourth strategy is to examine the role of race/ ethnicity on the relationship between economic conditions and child maltreatment. Previous research indicates that higher proportions of African Americans experience poverty and child welfare involvement (Dettlaff et al., 2011) suggesting the need to

include race/ethnicity as a covariate or as a moderator of the relationship between economic conditions and maltreatment (Hines et al., 2004). The final approach is to continue conducting intervention studies with random assignment. One potential study might assess the effect of food vouchers on risk for child physical abuse and neglect.

Based on the well-fitting CFA and SEM models, another next step is to develop a family economic wellbeing scale. This could be a short and simple checklist for practitioners to use in their practice with families in a variety of public health and child welfare settings. Beyond family income, many child maltreatment prevention programs and child welfare agencies do not thoroughly explore their clients' economic conditions and how these may place stress on families (Dettlaff et al., 2011). These agencies may be missing significant family stressors that are important for intervention.

Related to the significant and surprising findings of this dissertation study, researchers need to refine health hardship and economic state, and explore the role of bill-paying hardship and food hardship. As discussed in the section on limitations, most literature on health hardship uses the ability to visit a doctor or the receipt of health insurance to demonstrate a health hardship (Courtney et al., 2005; Yang, 2012). Instead, the results from this dissertation suggest that better indicators of health hardship are needed to examine the timely access, quality and affordability of healthcare. Likewise, further exploration is needed on the direct and indirect roles of food hardship, bill-paying hardship, and the economic state on risk for child physical abuse and neglect. Since the indirect effect of food hardship on risk for child physical abuse was small, a next step is to test for direct effects of the mediators on risk for child physical abuse. In addition, given the small, statistically significant effect of food hardship and bill-paying hardship ($p<.05$), attention should be focused on these two hardships when considering family stressors such as parenting stress, depression and domestic violence. Future studies should examine the

role of all the economic predictors of risk for child neglect to expand our understanding of the unique role of material hardships.

There is a substantial need for qualitative research on the relationship between economic conditions and child maltreatment. Although there is qualitative research on material hardship (Heflin et al., 2009), there is very little qualitative or mixed methods research on the relationship between economic conditions and risk for child physical abuse. This is troubling for several reasons. First, the experiences of children and families should guide our understanding of economic conditions and how these conditions create an environment for child abuse to occur. Second, although the measurement models and structural model indicate an underlying structure of the relationship between the economic and family risk factors of child physical abuse, there is very little evidence that the economic constructs predict parenting stress, domestic violence, depression, or risk for child physical abuse. Social work researchers and practitioners may be missing other important, dynamic factors that influence the environment in which abuse occurs that can only be captured by qualitative research. Further, qualitative research may provide the rich detail needed to redefine economic conditions and identify other pertinent mediators and moderators of risk for child physical abuse that were missing in this dissertation research.

Implications for social work policy. The complex and dynamic relationship between economic conditions, family risk factors, and risk for child physical abuse requires multilayered and conceptual policy solutions that address all angles of family wellbeing. This section details the direct policy implications that may lead to future policy solutions.

Given the current political and economic environment across the country, it is imperative for social workers to make the case for the economic security of all families and the impact of economic insecurity on a host of child and family outcomes, including marital conflict, parenting stress, depression and risk for child physical abuse. At present, however, many states are

reducing their social assistance programs that provide families with the necessary tools for survival. These necessities include food, shelter, clothing, childcare and transportation. The Center on Budget and Policy Priorities (2014) reported that cash assistance was 20% less in 2014 than it was in 1996. As Cancian and colleagues (2013) found, reducing a family's access to cash was detrimental for children. Children were 10% less likely to experience subsequent maltreatment investigations when their families received all of the child support payments owed to them when compared to families that received 41% of the child support payments (Cancian et al., 2013).

This dissertation research also has implications for traditional child maltreatment legislation such as CAPTA (1974), as well as policies on poverty prevention, including the supplemental nutrition assistance program (SNAP) provided through the *Agricultural Act* of 2014 (128 STAT. § 649), low income home energy assistance program ([LIHEAP], 2008) (42 U.S.C. § 8621-8630), and TANF (1996), a statute of the SSA (42 U.S.C. § 601-619). Despite the number of people affected by both child maltreatment and poverty prevention policies, these policies have distinct prevention goals and do not acknowledge that their programs may serve the same populations. As indicated in the literature review, there are a number of families who receive TANF, SNAP, and Medicaid while in the child welfare system. In response, the relevant federal agencies might consider evaluating these policies using additional outcomes related to family wellbeing. In addition to reducing poverty, potential outcomes might include a reduction of parenting stress and domestic violence, particularly given the relationship between economic conditions and parenting stress, domestic violence and depression presented in this dissertation.

A final policy implication is to encourage innovative pilot projects through local and federal grant applications. Such pilot projects could help supply the information missing on the relationship between economic conditions and child maltreatment. In recent years, for example,

the Administration for Children and Families (ACF) has issued requests for proposals related to housing interventions (DHHS, 2013), and innovative strategies for the reduction of child maltreatment, including economic interventions (DHHS, 2014). Although ACF's current priorities include housing interventions for families involved with child welfare, this dissertation research provides the rationale for proposing pilot projects related to food security and child maltreatment. In addition, the departments that oversee SNAP, energy assistance and TANF might consider exploring the impact of their policies on measures of family wellbeing, i.e., depression, parenting stress, domestic violence, and risk for child physical abuse when evaluating their policies and issuing requests for proposals.

Implications for social work practice. The perplexing and elusive relationship between economic conditions, family risks, and risk for child physical abuse requires refined attention to social work practice. These implications are discussed here.

One implication relates to the provision of services. Although families may be referred for parent education services, these issues may not be the most pressing ones for families. Instead, the well-fitting measurement model suggests that a host of complex stressors accompany the risk for child physical abuse. In response, social workers must meet families where they are. Although most social workers are well versed in this idea, it is worth re-emphasizing given the entangled relationship between economic conditions, parenting stress, domestic violence, depression, and risk for child physical abuse in the mediation model. In practice, this means that social workers must address the family's most urgent problems even if these stressors seem unrelated to the reason for referral. For example, families may be referred to family preservation services while experiencing homelessness. In these instances, social workers are obligated to tackle the issue of homelessness along with the referral.

A related proposition is that social work practice with families ranging from assessment, goal planning and intervention must address the multiple parenting and economic stressors associated with positive child and family outcomes rather than focusing solely on individual dimensions such as parenting skills (Asawa, Hansen, & Flood, 2008). This is the case because the measurement model highlights the importance of context when dealing with risk for child physical abuse. Most social workers are familiar with the person-*in*-environment notion of the ecological perspective (Meyer, 1995). In theory, this means that clients and their environments are inextricably connected and possess an interdependent relationship. For families at risk for abuse, parents simultaneously manage the everyday complications of parenting stress while coping with personal issues and the economic stressors of raising a family. Social workers from the fields of poverty prevention and child maltreatment prevention need to consider the context and environment of the family, especially regarding their economic security and family risk factors.

Further, there is a need for families and caseworkers to guide society's understanding of the relationship between economic conditions and risk for child physical abuse. The findings from this dissertation imply that the relationship between economic stressors and parenting stress, domestic violence, depression and child physical abuse is not a straightforward relationship. Instead, there may be an ongoing, dynamic, bidirectional relationship between the variables, for example, between parenting stress and income, or between risk for child physical abuse and depression. This nuanced relationship is not captured easily by quantitative methods. In fact, the inquiry on the economic conditions of child maltreatment may be missing the point entirely. After decades of research, this area of inquiry would benefit from the perspective of families and workers. When thinking about the relationship between material hardship and child maltreatment, what are TANF and child welfare workers experiencing with their clients that

could inform our understanding of this issue? Which families are thriving and which families are not? What other issues are affecting the relationship between material hardship and child maltreatment? Likewise, families at risk for child maltreatment should inform researchers and program evaluators about the most pertinent stressors for their families, economic or not.

A related note is that this inquiry represents multiple social problems. In social work education, most students learn to apply the ecological perspective when working with clients (Belsky, 1980). Although this approach orients students to the mutually interdependent and interactive relationship between systems, this perspective does not offer specificity in situations where economic hardship is present. Given that many clients are poor, social workers should be oriented to the issue of economic security with a conceptual framework, namely Conger and colleagues' (1992) family stress model. Using a streamlined framework can help students visualize the relationship between economic stressors and family risk, situate their work with families, and know what questions to ask of families.

Most importantly, this dissertation research underscores the importance of economic security for a family's wellbeing and risk for child physical abuse. In accord with the *Code of Ethics of the National Association of Social Workers* (NASW, 2008), social work practitioners have a specific obligation to promote social and economic justice in their practice with families. Regarding the findings from this dissertation research and social workers' call for economic justice, inadequate economic resources and maltreatment constitute social justice issues and serious social problems. Although social workers want to provide the best services for families, this task is difficult without identifying the most pertinent stressors of risk for child physical abuse. In fact, the experience of child maltreatment may represent a symptom of several long-term stressors that culminated as child maltreatment. Through the experience of families and workers, researchers should ask what happened to a family prior to child abuse and neglect.

What can we do to prevent child maltreatment? As researchers, we are not capturing these dynamic, nuanced and qualitative changes. As a society, we owe it to families to find the most meaningful stressors and then to know what to do about them.

Conclusion

Overall, the results from this dissertation research provide critical insights into the relationship between economic conditions and risk for child physical abuse. The findings highlight the importance of using a comprehensive model when examining the influence of economic conditions on family risk and risk for child physical abuse. Further, this dissertation research offers implications for social work research, policy and practice, and suggestions for building on the current conceptual and empirical understanding of the relationship between economic conditions and risk for child physical abuse. The hope is that this dissertation research will contribute our knowledge of the context of child physical abuse, ignite future research, and benefit future generations of children, families, and practitioners.

References

Abbott, G. (1922). Federal aid for the protection of maternity and infancy. *American Journal of Public Health, XII*(9), 737–742.

Appel, A. E., & Holden, G. W. (1998). The co-occurrence of spouse and physical child abuse: A review and appraisal. *Journal of Family Psychology, 12*, 578−599.

Asawa, L. E., Hansen, D. J., & Flood, M. F. (2008). Early childhood intervention programs: Opportunities and challenges for preventing child maltreatment. *Education and Treatment of Children, 31(1),* 73-110.

Ashiabi, G. S., & O'Neal, K. K. (2007). Children's health status: Examining the associations among income poverty, material hardship, and parental factors. *PLoS ONE 2*(9): e940.

Azar, S. T. (2002). Parenting and child maltreatment. In M. H. Bornstein (Ed.), *Handbook of parenting: Volume 4 social conditions and applied parenting* (2nd ed.) (pp. 361-388). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Batten, S. V., Aslan, M., Maciejewski, P. K., & Mazure, C. M. (2004). Childhood maltreatment as a risk factor for adult cardiovascular disease and depression. *Journal of Clinical Psychology, 65(2)*, 249–254.

Bendheim-Thoman Center for Research on Child Wellbeing. (2008). *Introduction to the Fragile Families public use data. Baseline, one-year, three-year, and five-year core telephone data.* Princeton, NJ: Princeton University.

Bendheim-Thoman Center for Research on Child Wellbeing and Columbia Population Research Center. (2011). *Data user's guide for the nine-year follow-up wave of the Fragile Families and Child Wellbeing Study.* Retrieved from http://www.fragilefamilies.princeton.edu/documentation/year9/year9wave_ff_public.pdf

Berger, L. M. (2004). Income, family structure, and child maltreatment risk. *Children and Youth Services Review, 26(8)*, 725-748.

Berger, L.M. (2007). Socioeconomic factors and substandard parenting. *Social Service Review, 81(3)*, 485-522.

Berger, L. M., & Waldfogel, J. (2011). *Economic determinants and consequences of child maltreatment.* (OECD Social, Employment and Migration Working Papers, No. 111). Paris, France: OECD Publishing.

Belsky, J. (1980). Child maltreatment: An ecological integration. *American Psychologist, 35(4)*, 320-335.

Belsky, J. (1993). Etiology of child maltreatment: A developmental-ecological analysis. *Psychological Bulletin, 114*(3), 413-434.

Beverly, S. G. (1999). *Economic poverty reconsidered: Material hardship and income-poverty in the United States.* (Doctoral dissertation). Washington University, St. Louis, MO.

Beverly, S. G. (2001). Measures of material hardship: Rationale and recommendations. *Journal of Poverty, 5(1),* 23-41.

Bickel, G., Nord, M., Price, C., Hamilton, W., & Cook, J. (2000). *Guide to measuring household food security: Revised 2000.* Alexandria, VA: Office of Analysis, Nutrition, and Evaluation, Food and Nutrition Service, USDA. Retrieved from http://www.fns.usda.gov/fsec/files/fsguide.pdf

Bolger, K. E., Patterson, C. J., & Kupersmidt, J. B. (1998). Peer relationships and self-esteem among children who have been maltreated. *Child Development, 69(4),* 1171-1197.

Brown, J., Cohen, P., Johnson, J. G., & Salzinger, S. (1998). A longitudinal analysis of risk factors for child maltreatment: Findings of a 17-year prospective study of officially recorded and self-reported child abuse and neglect. *Child Abuse & Neglect, 22*(11), 1065-

1078.

Caffey, J. (1946). Multiple fractures in the long bones of infants suffering from chronic subdural hematoma. *American Journal of Roentgenology,* 56(2), 163–173.

Cancian, M., Yang, M.Y., & Slack, K. S. (2013). The effect of child support income on the risk of child maltreatment. *Social Service Review, 87*(3), 417-437.

Carle, A. C., Bauman, K. J., & Short, K. (2009). Assessing the measurement and structure of material hardship in the United States. *Social Indicator Research, 92,* 35-51.

Carlson, S. J., Andrews, M. S., & Bickel, G. W. (1998, April). Measuring food insecurity and hunger in the United States: Development of a national benchmark measure and prevalence estimates. In C. M. Olson (Chair), *Advances in measuring food insecurity and hunger in the U.S.* Symposium conducted at the meeting of the American Society for Nutritional Sciences, San Francisco, CA.

Center for the Study of Social Policy. (2004). *Protecting children by strengthening families: A guidebook for early childhood programs.* Washington, D.C: Author.

Center on Budget and Policy Priorities (2014). *TANF cash benefits have fallen by more than 20 percent in most states and continue to erode.* Retrieved from http://www.cbpp.org/cms/?fa=view&id=4222

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*, 233-255.

Cicchetti, D., & Toth, S. L. (2005). Child maltreatment. *Annual Review of Clinical Psychology, 1,* 409-438.

Coe, R. (2012). It's the effect size, stupid: What effect size is and why it is important. *Paper presented at the British Educational Research Association Annual Conference, September 12-14,* Exeter, ENG.

Cohen, W. J., & Ball, R. M. (1962). Public welfare amendments of 1962 and proposals for health insurance for the aged. *Social Security Bulletin,* 3–22.

Cohen, J. (1988). *Statistical power for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cole, D. A., & Maxwell, S. E. (2003). Testing meditational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*(4), 558-577.

Coleman, A. A. (1995). Introduction and study overview. In S. Bruchey (Ed.), *Child Abuse Reporting* (pp. 3-12).

Committee on Economic Security. (1935). *Report of the committee on economic security.* Retrieved from http://www.ssa.gov/history/reports/ces5.html.

Conger, R. D. (2005). *The effects of poverty and economic hardship across generations.* Davis, CA: University of California, Davis, Center for Public Policy Research.

Conger, R. D., & Conger, K. J. (2002). Resilience in Midwestern families: Selected findings from the first decade of a prospective, longitudinal study. *Journal of Marriage and Family*, *64*, 361-373.

Conger, R. D., Conger, K. J., Elder, G. H., Jr., Lorenz, F. O., Simons, R. L., & Whitbeck, L. B. (1992). A family process model of economic hardship and adjustment of early adolescent boys. *Child Development, 63,* 526-541.

Conger, R. D., Conger, K. J., Elder, G. H., Jr., Lorenz, F. O., Simons, R. L., & Whitbeck, L. B. (1993). Family economic stress and adjustment of early adolescent girls. *Developmental Psychology, 29*, 206-219.

Conger, R. D., Ge, X., Elder, G.H., Lorenz, F.O., & Simons, R.L. (1994). Economic stress, coercive family process, and developmental problems of adolescents. *Child Development,*

65(2), 541-561.

Conger, R. D., Ge, X. J., & Lorenz, F. O. (1994). Economic stress and marital relations. In R. D. Conger, & G. H. Elder, Jr. (Eds.), *Families in troubled times* (pp. 187-203). New York, NY: Aldine de Gruyter.

Conger, R. D., Wallace, L. E., Sun, Y., Simons, R. L., McLoyd, V. C., & Broday, G. H. (2002). Economic pressure in African American families: A replication and extension of the family stress model. *Developmental Psychology, 38(2),* 179-193.

Corso, P. S., & Fertig, A. R. (2010). The economic impact of child maltreatment in the United States: Are the estimates credible? *Child Abuse & Neglect, 34,* 294-304.

Courtney, M. E., Dworsky, A., Piliavin, I., & Zinn, A. (2005). Involvement of TANF applicant families with child welfare services. *Social Service Review, 79(1),* 119-157.

Courtney, M., Dworsky, A., Lee, J., & Raap, M. (2009). *Midwest evaluation of the adult functioning of former foster youth: Outcomes at age 23 and 24.* Chicago, IL: Chapin Hall at the University of Chicago.

Cox, C. E., Kotch, J. B., & Everson, M. D. (2003). A longitudinal study of modifying influences in the relationship between domestic violence and child maltreatment. *Journal of Family Violence, 18*(1), 5-17.

Dettlaff, A. J., Rivaux, S. L., Baumann, D. J., Fluke, J. D., Rycraft, J. R., & James, J. (2011). Disentangling substantiation: The influence of race, income, and risk on the substantiation decision in child welfare. *Children and Youth Services Review, 33*(9), 1630-1637.

Dew, J. (2007). Two sides of the same coin? The differing roles of assets and consumer debt in marriage. *Journal of Family Economic Issues, 28*, 89-104.

Duncan, G. J., Brooks-Gunn, J. & Klebanov, P.K. (1994). Economic deprivation and early

childhood development. *Child Development, 65(2),* 296-318.

Dworsky, A., Courtney, M. E., & Zinn, A. (2007). Child, parent, and family predictors of child welfare services involvement among TANF applicant families. *Children and Youth Services Review, 29*, 802-820.

Eamon, M. K. (2001). Antecedents and socioemotional consequences of physical punishment on children in two-parent families. *Child Abuse & Neglect, 6*, 787-802.

Edleson, J. L. (1999). The overlap between child maltreatment and woman battering. *Violence Against Women, 5*(2)*,* 134−154.

Epstein, M. R. (2001). *Predicting abuse and neglect in the first two years of life from risk assessments during the prenatal and perinatal period*. (Doctoral dissertation). University of California, Davis, CA.

Fallon, B., Trocme, N., Fluke, J., MacLaurin, B., Tonmyr, L., & Yuan, Y. (2010). Methodological challenges in measuring child maltreatment. *Child Abuse & Neglect*, *34*, 70–79.

Fantuzzo, J., Stevenson, H., Kabir, S. A., & Perry, M. A. (2007). An investigation of a community-based intervention for socially isolated parents with a history of child maltreatment. *Journal of Family Violence, 22*(2), 81-89.

Fein, D. J., & Lee, W. S. (2003). The impacts of welfare reform on child maltreatment in Delaware. *Children and Youth Services Review, 25*(1-2), 83-111.

Fisher, G. (2001). "Enough for a family to live on?" Questions from members of the American Public and New Perspectives from British Social Scientists. *Paper presented at the Twenty-third Annual Research Conference of the Association for Public Policy Analysis and Management*, Washington, DC.

Fragile Families and Child Well-being Study (FFCWS). (2002). *Diversity among unmarried parents* (No. 10). Princeton, NJ: Princeton University Bendheim-Thoman Center for Research on Child Wellbeing.

FFCWS. (2006). *Scales documentation and question sources for three-year questionnaires.* Retrieved from

http://www.fragilefamilies.princeton.edu/documentation/core/scales/ff_3yr_scales.pdf

FFCWS. (2008). *A brief guide to using the mother, father, and couple replicate weights for core telephone surveys waves 1-4.* Retrieved from

http://www.fragilefamilies.princeton.edu/documentation/core/weights/using_ffwgts_rev0 709.pdf

FFCWS. (2008). *Three-year in-home longitudinal study of pre-school aged children. User's guide.* Retrieved from

http://www.fragilefamilies.princeton.edu/documentation/collaborative/inhome/36m/User Guide_36M-IH_revisedMarch08.pdf

Fryer, G., & Miyoshi, T. (1996). The role of the environment in the etiology of child maltreatment. *Aggression and Violent Behavior, 1(4),* 317-326.

Gelman, A., & Hill, J. (2007). *Data analysis using regression and multilevel/hierarchical models.* Cambridge, UK: Cambridge University Press.

Gigantesco, A., & Morosini, P. (2008). Development, reliability and factor analysis of a self-administered questionnaire which originates from the World Health Organization's Composite International Diagnostic Interview – Short Form (CIDI-SF) for assessing mental disorders. *Clinical Practice and Epidemiology in Mental Health, 4,* 8.

Hager, A. D., & Runtz, M. G. (2012). Physical and psychological maltreatment in childhood and later health problems in women: An exploratory investigation of the roles of perceived stress and coping strategies. *Child Abuse & Neglect, 36*, 393–403.

Hamilton, W. L., Cook, J. T., Thompson, W. W., Buron, L. F. Frongillo, E. A., Olson, C. M., & Wehler, C. A. (1997). *Household security in the United States in 1995: Technical report of the Food Security Measurement Project.* Washington, DC: United States Department of Agriculture, Food and Consumer Service, Office of Analysis and Evaluation.

Heflin, C. M. (2006). *Dynamics of material hardship in the women's employment study. Discussion paper no. 1315-06.* Madison, WI: Institute for Research on Poverty.

Heflin, C., Sandberg, J., & Rafail, P. (2009). The structure of material hardship in U.S. households: An examination of the coherence behind common measures of well-being. *Social Problems, 56*, 746-764.

Herrenkohl, T. I, Hong, S., Klika, J. B., Herrenkohl, R. C., & Russo, M. J. (2013). *Journal of Family Violence, 28*, 191-199.

Herrera, V., & McCloskey, L. (2001). Gender differences in the risk for delinquency among youth exposed to family violence. *Child Abuse & Neglect, 25*, 1037–1051.

Hines, A. M., Lemon, K., Wyatt, P., & Merdinger, J. (2004). Factors related to the disproportionate involvement of children of color in the child welfare system: A review and emerging themes. *Children & Youth Services Review, 26*(6), 507-527.

Hofferth, S., Davis-Kean, P.E., Davis, J., & Finkelstein, J. (1997). *The child development supplement to the Panel Study of Income Dynamics: 1997 user guide.* Ann Arbor, MI: Survey Research Center, The University of Michigan Institute for Social Research. Retrieved from https://psidonline.isr.umich.edu/CDS/cdsi_userGD.pdf

Honaker, J., King, G., & Blackwell, M. (2015). *Package 'Amelia'*. Retrieved from http://cran.r-project.org/web/packages/Amelia/Amelia.pdf

Horowitz, A. V., Widom, C. S., McLaughlin, J., &White, H. R. (2001). The impact of childhood abuse and neglect on adult mental health: A prospective study. *Journal of Health and Social Behavior, 42*, 184–201.

Iceland, J. (2005). Measuring poverty: Theoretical and empirical considerations. *Measurement, 3*(4), 207-243.

Iceland, J., & Bauman, K. J. (2007). Income poverty and material hardship: How strong is the association? *The Journal of Socio-Economics, 36*, 376-396.

Jaffee, S. R., Caspi, A., Moffitt, T. E., Polo-Tomas, M., & Taylor, A. (2007). Individual, family, and neighborhood factors distinguish resilient from non-resilient maltreated children: A cumulative stressors model. *Child Abuse & Neglect, 31*, 231–253.

Keith, T. Z. (2006). *Multiple regression and beyond.* Boston, MA: Allyn & Bacon.

Kempe, C. H., Silverman, F. N., Steele, B. F., Droegemueller, W., & Silver, H. K. (1962). The battered-child syndrome. *Journal of the American Medical Association, 181*, 17-24.

Kessler, R.C., Andrews, G., Mroczek, D., Ustun, T.B., & Wittchen, H.U. (1998). The World Health Organization Composite International Diagnostic Interview Short-Form (CIDI-SF). *International Journal of Methods in Psychiatric Research, 7*,171-185.

Kinard, M. E. (2001). Perceived and actual academic competence in maltreated children. *Child Abuse and Neglect, 25*, 33−45.

Klika, J. B, Herrenkohl, T. I., Lee, J. O. (2012). School factors as moderators of the relationship between physical child abuse and pathways of antisocial behavior. *Journal of Interpersonal Violence, 28*(4), 852-867.

Kline, R. B. (2005). *Principles and practices of structured equation modeling*. New

York, NY: Guilford Press.

Koenig, A. L., Cicchetti, D., & Rogosch, F. A. (2000). Child compliance/noncompliance and maternal contributors to internalization in maltreating and nonmaltreating dyads. *Child Development*, *71*, 1018-1032.

Leeb, R. T., Lewis, T., Zolotor, A. J. (2011). A review of the physical and mental health consequences of child abuse and neglect and implications for practice. *American Journal of Lifestyle Medicine, 5*(5), 454-468.

Lemons, J. S. (1969). The Sheppard-Towner Act: Progressivism in the 1920s. *The Journal of American History, 55*(4), 776–786.

Lindert, J., von Ehrenstein, O. S., Grashow, R., Gal, G., Braehler, E., & Weisskopf, M. G. (2014). Sexual and physical abuse in childhood is associated with depression and anxiety over the life course: Systematic review and meta-analysis. *International Journal of Public Health, 59*, 359-372.

Littell, J. H., Corcoran, J., & Pillai, V. (2008). *Systematic reviews and meta-analysis*. New York, NY: Oxford University Press.

Little, T. (2013). *Longitudinal structural equation modeling.* New York, NY: Guilford Press.

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research*, *39*, 99-128.

Manly, J. T. (2005). Advances in research definitions of child maltreatment. *Child Abuse & Neglect, 29*, 425–439.

Mayer, S. E., & Jencks, C. (1989). Poverty and the distribution of material hardship. *Journal of Human Resources, 24*(1), 88-113.

McCrea, R. C. (1910). *The humane movement.* New York, NY: Columbia University Press.

McDaniel, M., & Slack, K. (2005). Major life events and the risk of a child maltreatment investigation. *Children and Youth Services Review, 27(2)*, 171-195.

McLanahan, S. (n.d.). *Fragile families and the reproduction of poverty*. Retrieved from http://crcw.princeton.edu/workingpapers/WP08-04-FF.pdf

McLoyd, V. C. (1998). Socioeconomic disadvantage and child development. *American Psychologist, 53(2),* 185-204.

Mertler, C.A., & Vannatta, R.A. (2005). *Advanced multivariate statistical methods: Practical applications and interpretation* (3rd ed.). Glendale: Pyrczak Publishing.

Miller, A. B., Esposito-Smythers, C., Weismoore, J. T., & K. D. Renshaw. (2013). The relation between child maltreatment and adolescent suicidal behavior: A systematic review and critical examination of the literature. *Clinical Child and Family Psychological Review, 16*(2)*,* 146-172.

Nanni, V., Uher, R., Danese, A. (2012). Childhood maltreatment predicts unfavorable course of illness and treatment outcome in depression: A meta-analysis. *American Journal of Psychiatry, 169*(2), 141–151.

Nelson, G. (2011). Measuring poverty: The official U. S. measure and material hardship. *Poverty & Public Policy, 3(3)*, 1-35.

Neuman, W. L. (2000). *Social research methods: Qualitative and quantitative approaches* (4th ed.). Boston, MA: Allyn & Bacon.

Newland, R. P., Crnic, K. A., Cox, M. J., & Mills-Koonce, R. (2013). The family model stress and maternal psychological symptoms: Mediated pathways from economic hardship to parenting. *Journal of Family Psychology, 27(1)*, 96-105.

Nolte, S., Elsworth, G. R., Sinclair, A. J., Osborne, R. H. (2012). The inclusion of the 'then-test' questions in post-test questionnaires alters post-test responses: A randomized study of bias in health program evaluation. *Quality of Life Research, 21*, 487-494.

Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J., & Vos, T. (2012). The long-term health consequences of child physical abuse, emotional abuse, and neglect: A systematic review and meta-analysis. *PLOS Medicine, 9*(11), 1–31.

Ouellette, T., Burstein, N., Long, D., & Beecroft, E. (2004). *Measures of material hardship: Final report*. Washington, DC: U.S. Department of Health and Human Services, Office of the Secretary, Office of the Assistant Secretary for Planning and Evaluation.

Ovwigho, P. C., Leavitt, K., & Born, C. E. (2003). Risk factors for child abuse and neglect among former TANF families: Do later leavers experience greater risk? *Children and Youth Services Review, 25*(1), 139–63.

Pornprasertmanit, S., Miller, P., Schoemann, A., Rosseel, Y., Quick, C., Garnier-Villarreal, M., …Chesnut, S. (2015). *Package 'semTools'*. Cran.r-project.org. http://cran.r-project.org/web/packages/semTools/semTools.pdf

Preacher, K. J., & Selig, J. P. (2012). Advantages of Monte Carlo confidence intervals for indirect effects. *Communication Methods and Measures, 6,* 77-98.

Pumphrey, R. E., & Pumphrey, M. W. (Eds.). (1967). *The heritage of American social work*. New York, NY: Columbia University Press.

Reichman, N. E., Teitler, J. O., Garfinkel, I., & McLanahan, S. S. (2001). Fragile families: Sample and design. *Children and Youth Services Review, 23*(4/5), 303-326.

Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1-36.

Savalei, V. (2014). Understanding robust corrections in structural equation modeling. *Structural*

Equation Modeling: A Multidisciplinary Journal, 21(1), 149-160.

Schafer, J.L., & Graham, J.W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*(2), 147-177.

Sedlak, A. J., Mettenburg, J., Basena, M., Petta, I., McPherson, K., Green, A., & Li, Spencer. (2010). *Fourth national incidence study of child abuse and neglect (NIS–4): Report to congress.* Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families.

Selig, J. P., & Preacher, K. J. (2008). *Monte Carlo method for assessing mediation: An interactive tool for creating confidence intervals for indirect effects* [Computer software]. Retrieved from http://quantpsy.org/medmc/medmc.htm

Shaffer, A., Huston, L., & Egeland, B. (2008). Identification of child maltreatment using prospective and self-report methodologies: A comparison of maltreatment incidence and relation to later psychopathology. *Child Abuse & Neglect, 32*, 682–692.

Shook, K. (1999). Does the loss of welfare income increase the risk of involvement with the child welfare system? *Children and Youth Services Review, 21*(9), 781–814.

Sidebotham, P., Heron, J., Golding, J., & Team, A. S. (2002). Child maltreatment in the children of the nineties: Deprivation, class, and social networks in a UK Sample. *Child Abuse & Neglect*, *26(12)*, 1243–1259.

Slack, K. S., Holl, J. L., Lee, B. J. McDaniel, M., Altenbernd, L., & Stevens, A. B. (2003). Child protective intervention in the context of welfare reform: The effects of work and welfare on maltreatment reports. *Journal of Policy Analysis and Management, 22(4),* 517–536.

Slack, K. S., Lee, B. J., & Berger, L. M. (2007). Do welfare sanctions increase child protection system involvement? A cautious answer. *Social Service Review, 81(2),* 207-228.

Social Indicators Survey Center, Columbia University School of Social Work. (1999). *1999 New York City Social Indicators Survey: Documentation and codebook, revised version.* Retrieved from http://www.siscenter.org/

Stevens, J. P. (2002). *Applied multivariate statistics for the social sciences* (4th ed.). Mahwah, NJ: LEA.

Stith, S. M., Liu, T., Davies, L. C., Boykin, E. L., Alder, M. C., Harris, J. M.,…Dees, J. E. M. E. G. (2009). Risk factors in child maltreatment: A meta-analytic review of the literature. *Aggression and Violent Behavior, 14,* 13-29.

Straus, M. A., Hamby, S. L., Finkelhor, D., & Moore, D. W. (1998). Identification of child maltreatment with parent-child conflict tactics scales: Development and psychometric data for a national sample of American parents. *Child Abuse & Neglect, 22*(4), 249-270.

Survey on Income and Program Participation: 1996 Panel Wave 8 Adult Well-Being Topical Module Questionnaire. (1998). Retrieved from http://www.census.gov/apsd/techdoc/sipp/sipp04w8t.pdf

Tabachnick, B.G., & Fidell, L.S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson Education.

Taylor, J., Spencer, N., & Baldwin, N. (2000). Social, economic, and political context of parenting. *Archives of Disease in Childhood, 82(2),* 113-117.

Thornberry, T. P., Henry, K. L., Ireland, T., & Smith, C. (2010). The causal impact of childhood-limited maltreatment and adolescent maltreatment on early adult adjustment. *Journal of Adolescent Health, 49,* 359–365.

Thornberry, T. P., Ireland, T. O., & Smith, C. A. (2001). The importance of timing: The varying impact of childhood and adolescent maltreatment on multiple problem outcomes. *Development and Psychopathology, 13(4)*, 957–979.

Thrane, L. E., Hoyt, D. R., Whitbeck, L. B., & Yoder, K. A. (2006). Impact of family abuse on

    running away, deviance, and street victimization among homeless rural and urban youth.

    Child Abuse & Neglect, 30, 1117–1128.

Tomarken, A. J., & Waller, N. G. (2005). Structural equation modeling: Strengths, limitations,

    and misconceptions. *Annual Review of Clinical Psychology, 1,* 31-65.

U.S. Department of Health and Human Services (DHHS). (2013). *Partnerships to demonstrate*

    the effectiveness of supportive housing for families in the child welfare system. Retrieved

    from

    https://www.acf.hhs.gov/hhsgrantsforecast/index.cfm?switch=grant.view&gff_grants_for

    ecastInfoID=38683

U.S. Department of Health and Human Services (DHHS). (2014)*. Grants in child maltreatment*

    research using innovative approaches. Retrieved from

    https://www.acf.hhs.gov/hhsgrantsforecast/index.cfm?switch=grant.view&gff_grants_for

    ecastInfoID=66982

U.S. Department of Health and Human Services (DHHS). (2015). *Child maltreatment 2013*.

    Washington, DC: Author.

van Buuren, S., & Groothuis-Oudshoorn, K. (2011). mice: Multivariate Imputation by Chained

    Equations in R. *Journal of Statistical Software, 45*(3), 1-67.

Ventrell, M. (1998). Evolution of the dependency component of juvenile court. *Juvenile and*

    Family Court Journal, 49(4), 1-30.

Votruba-Drzal, E. (2003). Income changes and cognitive stimulation in young children's home

    learning environments. *Journal of Marriage and Family, 65*(2), 341-355.

Vu, T. (2011). *Five-year in-home longitudinal study of pre-school aged children. User's guide.*

    Retrieved from

http://www.fragilefamilies.princeton.edu/documentation/collaborative/inhome/60m/InHo me5Yr_UserGuide2011.pdf

Wang, C., & Holton, J. (2007). Total estimated cost of child abuse and neglect in the United States. *Economic Impact Study*. Chicago, IL: Prevent Child Abuse America.

Watkins, S. A. (1990). The Mary Ellen myth: Correcting child welfare history. *Social Work, 35*(6), 500-503.

White, H. R., & Widom, C. S. (2008). Three potential mediators of the effects of child abuse and neglect on adult substance use among women. *Journal of Studies on Alcohol, 69*, 337–347.

Widom, C. S., Czaja, S. J., Bentley, T., & Johnson, M. S. (2012). A prospective investigation of physical health outcomes in abused and neglected children: New findings from a 30-year follow-up. *American Journal of Public Health, 102*(6), 1135–1144.

Yang, M. Y. (2012). *The effect of material hardship on child protective service involvement.* (Doctoral dissertation). University of Wisconsin-Madison, Madison, WI.

Yeung, W. J., Linver, M. R., & Brooks-Gunn, J. (2002). How money matters for young children's development: Parental investment and family processes. *Child Development, 73*, 1861-1879.

Appendices

Appendix A: Methodological Notes

Appendix B: Additional Figures and Tables

Appendix A: Methodological Notes

Data Cleaning

Prior to data analysis, I examined the data for normality, linearity and multicollinearity, homoscedasticity, and outliers (Tabachnick & Fidell, 2007). To assess normality, I inspected histograms, and values of skewness and kurtosis. Most of the histograms demonstrated a lack of normality and were skewed to the right. For the skewness and kurtosis values, Kline (2005) recommends cut-off values of 3.0 and 10.0, respectively. Of the 76 indicators, 8 indicators exceeded the cut-off guidelines for acceptable skewness and kurtosis, with values ranging from +/- 3.27 to 7.58 for skewness and 12.32 to 144.07 for kurtosis (see Table 7). Negative skewness values indicate a concentration of lower values (left skew) while positive skewness values indicate a concentration of higher values (right skew). Income-to-poverty ratio at all years, for example, was negatively skewed, meaning that many participants experienced a smaller income-to-poverty ratio. In contrast, shaking one's child in the past year (*shook*) was positively skewed, meaning that more mothers reported shaking their child more frequently. Regarding kurtosis, income-to-poverty ratio exhibited the greatest violations of kurtosis at all years. Taken together, larger skewness and kurtosis values indicate more non-normality. Although these values indicate a violation of multivariate normality, I did not transform the variables. Transformations do not improve the overall interpretation of a model and can alter the interpretation of the relationship between latent variables (Little, 2013). Instead, I used a robust maximum likelihood (MLR) estimator to handle the violations of multivariate normality.

Table 7
Descriptive Statistics of Study Variables

Indicators	*M(SD)*	Range	Skewness	Kurtosis
z.povratio9	0.00 (1.00)	-7.79 to 0.48	-6.63	47.62
z.povratio5	0.00 (1.00)	-15.36 to 0.88	-4.46	41.58
z.povratio3	0.00 (1.00)	-27.58 to 0.55	-7.58	144.07
z.freefood9.n	0.00 (1.00)	-0.41 to 2.42	2.00	2.01
z.dep9.n	0.00 (1.00)	-0.41 to 2.41	2.00	1.99
z.dep5.n	0.00 (1.00)	-0.38 to 2.65	2.27	3.15
z.dep3.n	0.00 (1.00)	-0.43 to 2.33	1.90	1.62
work9	1.70 (0.96)	1.00 to 4.00	1.14	0.06
work5	1.77 (0.99)	1.00 to 4.00	1.02	-0.20
work3	1.83 (1.01)	1.00 to 4.00	0.94	-0.38
trapped9	1.46 (0.76)	1.00 to 4.00	1.57	1.53
trapped5	1.59 (0.86)	1.00 to 4.00	1.26	0.53
trapped3	1.64 (0.89)	1.00 to 4.00	1.18	0.27
tired9	2.35 (1.11)	1.00 to 4.00	0.08	-1.37
tired5	2.52 (1.05)	1.00 to 4.00	-0.16	-1.18
tired3	2.59 (1.04)	1.00 to 4.00	-0.23	-1.11
tanfssi9	0.13 (0.25)	0.00 to 1.00	1.65	1.84
tanfssi5	0.13 (0.24)	0.00 to 1.00	1.54	1.40
tanfssi3	0.14 (0.24)	0.00 to 1.00	1.44	1.04
spank9	2.09 (2.41)	-5.67 to 9.56	0.56	-0.22
spank5	2.31 (2.06)	-5.85 to 10.48	0.18	-0.60
spank3	2.66 (2.12)	-4.07 to 9.84	0.05	-0.87
slap9	1.69 (2.23)	-6.15 to 8.61	0.76	0.29
slap5	1.82 (2.07)	-5.13 to 8.68	0.43	-0.40
slap3	2.29 (2.23)	-5.48 to 10.07	0.19	-0.73
shook9	0.34 (1.08)	0.00 to 7.00	3.86	17.31
shook5	0.28 (0.83)	0.00 to 7.00	4.15	21.73
shook3	0.22 (0.70)	0.00 to 7.00	4.58	27.60
privateins9	0.60 (0.49)	0.00 to 1.00	-0.41	-1.84
privateins5	0.47 (0.50)	0.00 to 1.00	0.14	-1.98
privateins3	0.48 (0.50)	0.00 to 1.00	0.06	-2.00
pinch9	0.60 (1.37)	0.00 to 7.00	2.91	8.97
pinch5	0.40 (1.01)	0.00 to 7.00	3.27	12.32
pinch3	0.37 (0.99)	0.00 to 7.00	3.47	13.86
pha9	0.45 (0.50)	0.00 to 1.00	0.20	-1.96
pha5	0.28 (0.45)	0.00 to 1.00	0.96	-1.07
motherspank5	0.68 (0.34)	0.33 to 2.00	0.95	0.55
motherspank3	0.76 (0.39)	0.33 to 2.00	0.77	-0.03
medicaid9	0.61 (0.49)	0.00 to 1.00	-0.45	-1.80
medicaid5	0.57 (0.49)	0.00 to 1.00	-0.29	-1.92
medicaid3	0.59 (0.49)	0.00 to 1.00	-0.36	-1.87
housec9	0.07 (0.15)	0.00 to 0.67	1.81	2.32
housec5	0.04 (0.11)	0.00 to 0.67	2.64	5.97
housec3	0.05 (0.12)	0.00 to 0.67	2.56	5.95
houseb9	0.05 (0.14)	0.00 to 1.00	2.87	8.68
houseb5	0.07 (0.15)	0.00 to 1.00	2.23	4.60
houseb3	0.07 (0.16)	0.00 to 1.00	2.43	6.27
housea9	0.08 (0.16)	0.00 to 1.00	2.17	4.85
housea5	0.12 (0.20)	0.00 to 1.33	1.68	2.63
housea3	0.17 (0.23)	0.00 to 1.33	1.30	1.30
hit9	1.43 (1.99)	0.00 to 7.00	1.41	1.12
hit5	1.11 (1.66)	0.00 to 7.00	1.42	1.10
hit3	0.93 (1.62)	0.00 to 7.00	1.77	2.22

Table 7
Descriptive Statistics of Study Variables

hard9	2.72 (1.09)	1.00 to 4.00	-0.35	-1.16
hard5	2.87 (1.01)	1.00 to 4.00	-0.56	-0.75
hard3	2.96 (0.97)	1.00 to 4.00	-0.65	-0.54
freefood5	0.11 (0.32)	0.00 to 1.00	2.47	4.08
freefood3	0.11 (0.31)	0.00 to 1.00	2.48	4.15
foodother9	0.23 (0.58)	-0.16 to 0.34	2.05	3.62
foodother5	0.21 (0.56)	-0.14 to 2.27	2.41	5.60
foodother3	0.20 (0.57)	-0.14 to 2.29	2.46	5.84
foodb5	0.82 (0.27)	0.67 to 2.33	1.98	3.88
foodb3	0.86 (0.30)	0.67 to 2.33	1.72	3.00
fooda5	0.50 (0.24)	0.33 to 1.67	1.44	1.66
fooda3	0.52 (0.26)	0.33 to 1.67	1.47	1.88
fatherspank5	0.99 (0.35)	0.67 to 2.67	1.12	1.06
fatherspank3	1.09 (0.39)	0.67 to 2.67	0.84	0.36
dvparcelc9	1.14 (0.21)	1.00 to 2.50	1.64	3.25
dvparcelc5	1.14 (0.21)	1.00 to 2.50	1.65	2.89
dvparcelc3	1.14 (0.21)	1.00 to 2.50	1.69	3.46
dvparcelb9	1.15 (0.18)	1.00 to 2.20	1.36	2.37
dvparcelb5	1.15 (0.18)	1.00 to 2.00	1.11	1.04
dvparcelb3	1.16 (0.19)	1.00 to 2.60	1.45	3.35
dvparcela9	1.09 (0.15)	1.00 to 2.20	2.12	5.72
dvparcela5	1.10 (0.17)	1.00 to 2.60	2.05	5.31
dvparcela3	1.09 (0.15)	1.00 to 2.20	2.15	5.49
billc9	0.17 (0.29)	0.00 to 1.00	1.51	1.22
billc5	0.12 (0.26)	0.00 to 1.00	2.03	3.29
billc3	0.10 (0.21)	0.00 to 1.00	2.04	3.37
billb9	0.21 (0.30)	0.00 to 1.00	1.06	0.12
billb5	0.18 (0.29)	0.00 to 1.00	1.32	0.73
billb3	0.18 (0.29)	0.00 to 1.00	1.38	0.91
billa9	0.20 (0.25)	0.00 to 1.00	1.01	0.04
billa5	0.17 (0.25)	0.00 to 1.00	1.28	0.63
billa3	0.16 (0.23)	0.00 to 1.00	1.22	0.52
abuseb9	1.15 (1.40)	-3.08 to 7.00	1.05	1.22
abuseb5	1.11 (1.21)	-2.56 to 6.50	0.79	0.77
abuseb3	1.33 (1.28)	-2.74 to 7.00	0.60	0.44
abusea9	1.30 (1.29)	-1.89 to 7.23	0.88	0.69
abusea5	1.23 (1.06)	-1.95 to 7.00	0.77	0.72
abusea3	1.27 (1.06)	-1.29 to 7.00	0.81	0.90

Notes. The out-of-bounds values for skewness (>3.00) and kurtosis (>10.00) are highlighted.

Regarding linearity and multicollinearity, I examined a correlation matrix to determine tolerance values ($1 - R^2$), scatterplots of likely skewed variables, and residual scatterplots of the dependent variables (constructs of parenting stress, depression, domestic violence, risk for child physical abuse). Small tolerance values indicate more multicollinearity: Tolerance values smaller than .20 are considered problematic, which corresponds to correlations of .90 and above (Stevens, 2002; Tabachnick & Fidell, 2001). The study variables did not demonstrate any

violations of the tolerance values. Regarding the scatterplots, the relationships between all likely skewed variables were examined. Given that most variables display non-normality, I inspected scatterplots of the relationship between selected indicators of the economic conditions with parenting stress, depression, and domestic violence, and between indicators of the mediators with indicators of risk for child physical abuse. None of the scatterplots were oval-shaped, indicating violations of normality and linearity. These scatterplots, however, demonstrated positive and weak relationships between all variables. To assess homoscedasticity, I examined residual scatterplots of the predictor variables plotted against the residuals of the dependent variables regressed on predictor. Homoscedasticity is present when the variability in the scores of predictor variables is similar across all other predictor variables (Mertler & Vannatta, 2005). Almost all of the indicators were similarly distributed, with the responses highly concentrated at low values and less concentrated as the values increased in size.

Model estimation. As mentioned previously, I selected Robust Maximum Likelihood (MLR) instead of Diagonally Weighted Least Squares (DWLS) to estimate the model. Although DWLS is more appropriate for severely non-normal and categorical data, the decision to use MLR was based on feasibility (Savalei, 2014). During the initial CFA testing of my comprehensive model, for example, I used DWLS as the estimator. The model ran for several weeks without converging. Per my methodologist's recommendations, I used MLR to expedite the process of invariance testing. Even with the use of MLR, the mediation model converged in three days.

Data Analysis

The *Methodology* section provides the rationale for the use of longitudinal confirmatory factor analysis (CFA) and longitudinal structural equation modeling (SEM). Although the *Methodology* section delivers a thorough review, the purpose of this section is to explain the

steps taken to arrive at the final measurement and structural models.

Prior to conducting the final SEM models, I conducted invariance testing for each construct besides health hardship and depression, because these are one- and two-item constructs. Invariance testing is not as reliable for one- and two-item constructs. The first purpose of the CFAs was to identify parcels using the balancing approach, as described in the *Methodology* section. I chose to use the balancing approach because a priori theory is lacking on how to construct latent variables in the field of child maltreatment. The second purpose was to establish strong invariance of the comprehensive model.

When my strong invariance model of all constructs failed to converge using DWLS, I conducted invariance testing with individual constructs, and then two groups of constructs from the comprehensive model. Using the DWLS estimator, I achieved strong or partial strong invariance for individual constructs and configural invariance for the two sets of constructs. The first model contained the economic predictors while the second model included the mediators and outcome variables. After the configural models converged for a week or longer, my methodologist advised me to use MLR instead of DWLS.

Once again, I conducted invariance testing for the two sets of constructs using MLR and found strong invariance. I then attempted to complete invariance testing for the comprehensive model and found weak invariance. Unfortunately, I received error messages when conducting the strong invariance model. These error messages were related to the missing values within the imputed datasets.

Although the strong invariance model did not converge, the original mediation model (with health hardship) and revised mediation model (without health hardship) successfully converged with the strong invariance constraints. Once the revised mediation model converged, I conducted strong invariance testing based on the revised mediation model (without health

hardship). As before, there were error messages related to the missing values of the imputed datasets.

Construct of health hardship. While conducting invariance testing for the individual constructs, I identified a problem with the health hardship construct. The original construct contained *drvisit* (family cannot afford a doctor or hospital visit when needed during the past 12 months), receipt of private insurance (*privateins*) and *medicaid*. The results from the configural model demonstrated small correlations between drvisit and medicaid, and drvisit and privateins (r =-.02 to -.22), very small loadings for drvisit (β =-.088), and an out-of-bounds standardized coefficient for privateins in year 9 (β=60.87). Along with my dissertation chair, my methodologist and I decided to exclude drvisit from the analysis. Once drvisit was deleted, the small loadings and out-of-bounds coefficients disappeared.

Appendix B: Additional Figures and Tables[10]

Table 8
Fraction Missing Values

Pathway		Fraction Missing	Pathway		Fraction Missing
dvparcelc3 ~~	dvparcelc5	0.602	houseb5 ~		0.713
house5 ~~	bill5	0.607	houseb9 ~		0.713
houseb5 ~~	houseb9	0.608	housea3 ~		0.717
bill9 ~~	dv9	0.614	housea5 ~		0.717
stress5 ~~	dv5	0.617	housea9 ~		0.717
food9 ~~	dv9	0.620	dv3 =~	dvparcelc3	0.722
foodb3 ~~	foodb3	0.621	dv5 =~	dvparcelc5	0.722
housea3 ~~	housea5	0.625	dv9 =~	dvparcelc9	0.722
housea5 ~~	housea9	0.631	dvparcelb9 ~~	dvparcelb9	0.722
econ3 ~~	dv3	0.631	housea5 ~~	housea5	0.724
dv9 ~	house5	0.637	housea9 ~~	housea9	0.728
housec3 ~~	housec9	0.639	foodb3 ~		0.727
econ5 ~~	dv5	0.639	foodb5 ~		0.727
house3 ~~	dv3	0.644	dv9 ~~	dv9	0.728
dv5 ~~	phapp5	0.650	houseb9 ~~	houseb9	0.728
housea3 ~~	housea3	0.650	dvparcelc5 ~~	dvparcelc5	0.729
bill5 ~~	dv5	0.653	dvparcelc9 ~~	dvparcelc9	0.730
dvparcela5 ~~	dvparcela5	0.660	food5 ~~	dv5	0.739
dv5 ~	food3	0.661	dv9 ~	dv5	0.746
phapp3 =~	fatherspank3	0.663	fatherspank5 ~~	fatherspank5	0.755
phapp5 =~	fatherspank5	0.663	dvparcelc3 ~~	dvparcelc3	0.761
house9 ~~	dv9	0.664	dv5 ~~	dv5	0.762
dvparcelb5 ~~	dvparcelb5	0.666	dvparcela5 ~~	dvparcela9	0.762
motherspank3 ~~	motherspank3	0.667	dv5 ~	dv3	0.783
phapp5 ~	dv3	0.669	houseb5 ~~	houseb5	0.794
dep9 ~~	dv9	0.669	dvparcelb3 ~~	dvparcelb3	0.807
pha5 ~~	pha9	0.670	dvparcela3 ~		0.810
fooda5 ~~	fooda5	0.673	dvparcela5 ~		0.810
house5 ~	house3	0.683	dvparcela9 ~		0.810
house3 =~	housea3	0.684	housec3 ~~	housec3	0.813
house5 =~	housea5	0.684	housec3 ~		0.819
house9 =~	housea9	0.684	housec5 ~		0.819
house3 =~	housec3	0.687	housec9 ~		0.819
house5 =~	housec5	0.687	fatherspank3 ~		0.838
house9 =~	housec9	0.687	fatherspank5 ~		0.838
dvparcelb5 ~~	dvparcelb9	0.687	fatherspank3 ~~	fatherspank3	0.840
dv9 ~	food5	0.688	dvparcelb3 ~		0.842
dv3 =~	dvparcela3	0.691	dvparcelb5 ~		0.842
dv5 =~	dvparcela5	0.691	dvparcelb9 ~		0.842
dv9 =~	dvparcela9	0.691	dvparcelc3 ~		0.857
food5 ~		0.693	dvparcelc5 ~		0.857
dvparcela3 ~~	dvparcela9	0.694	dvparcelc9 ~		0.857
house9 ~		0.694	housec9 ~~	housec9	0.861
house5 ~		0.695	phapp5 =~	pha5	0.864
econ9 ~~	dv9	0.696	phapp9 =~	pha9	0.864
dv3 =~	dvparcelb3	0.701	dv9 ~		0.871
dv5 =~	dvparcelb5	0.701	pha9 ~~	pha9	0.873

---

[10] Due to size, the variance/covariance matrix is not listed here, but is available upon request.

Table 8

Fraction Missing Values

Pathway		Fraction Missing	Pathway		Fraction Missing
dv9 =~	dvparcelb9	0.701	dvparcela9 ~~	dvparcela9	0.877
privateins5 ~~	privateins5	0.706	dv5 ~		0.914
house3 =~	houseb3	0.708	pha5 ~~	pha5	0.928
house5 =~	houseb5	0.708	pha5 ~		0.943
house9 =~	houseb9	0.708	pha9 ~		0.943
houseb3 ~		0.713			

Note. Due to space, only fraction missing values greater than .60 are reported in this table.

Table 9

Constructs and Indicators of the Proposed Model

Construct	Indicator	Type	Time
Economic state	1) Income/poverty threshold (computed)	Self-report; Continuous	3, 5, 9
	2) Receipt of food stamps (yes/no)*	Self-report; Binary	3, 5, 9
	3) Receipt of workman's compensation/ unemployment benefits/other (yes/no)*	Self-report; Binary	3, 5, 9
	4) Receipt of Temporary Assistance to Needy Families (yes/no)*	Self-report; Binary	3, 5, 9
	5) Receipt of supplemental security income (yes/no)*	Self-report; Binary	3, 5, 9
Parcels	1) foodother (average of econ variables #2, #3)	Self-report; Categorical	3, 5, 9
	2) tanfssi (average of econ variables #4, #5)	Self-report; Categorical	3, 5, 9
Sample item	*Has respondent received food stamps in the past 12 months?*		
Housing hardship	1) Presence of mice (yes/no)*	Observation; Binary	3, 5, 9
	2) Presence of broken/cracked windows on exterior of house exterior (yes/no)*	Observation; Binary	3, 5, 9
	3) Presence of broken/cracked windows on interior of house (yes/no)*	Observation; Binary	3, 5, 9
	4) Presence of exposed wires on interior of house (yes/no)*	Observation; Binary	3, 5, 9
	5) Presence of open holes/cracks on ceilings/walls on interior of house (yes/no)*	Observation; Binary	3, 5, 9
	6) Presence of open holes/cracks on ceilings/walls on common areas of house (yes/no)*	Observation; Binary	3, 5, 9
	7) Presence of open holes on floors on common areas of house (yes/no)*	Observation; Binary	3, 5, 9
	8) Presence of open holes on floors on interior of house (yes/no)*	Observation; Binary	3, 5, 9
Parcels	1) housea (average of house variables #3, #4, #6)	Observation; Categorical	3, 5, 9

Table 9

Constructs and Indicators of the Proposed Model

Construct	Indicator	Type	Time
	2) houseb (average of house variables #2, #7, #8)	Observation; Categorical	3, 5, 9
	3) housec (average of house variables #1, #5)	Observation; Categorical	3, 5, 9
Sample Item	*Do the interior common areas of the building (EXAMPLES: ENTRANCE, FOYER, HALLWAYS) contain open cracks or holes in walls or ceiling?*		
Bill-paying hardship	1) In past 12 mo, borrowed money from friends/family (yes/no)*	Self-report; Binary	3, 5, 9
	2) In past 12 mo, moved in with others b/c of finances (yes/no)*	Self-report; Binary	3, 5, 9
	3) In past 12 mo, partial/nonpayment of utilities (yes/no)*	Self-report; Binary	3, 5, 9
	4) In past 12 mo, partial/nonpayment of rent/mortgage (yes/no)*	Self-report; Binary	3, 5, 9
	5) In past 12 mo, disconnected utilities (yes/no)*	Self-report; Binary	3, 5, 9
	6) In past 12 mo, disconnected phone services b/c of nonpayment (yes/no)*	Self-report; Binary	3, 5, 9
	7) In past 12 mo, eviction b/c of nonpayment (yes/no)*	Self-report; Binary	3, 5, 9
Parcels	1) billa (average of bill variables #3, #6, #7)	Self-report; Categorical	3, 5, 9
	2) billb (average of bill variables #1, #2)	Self-report; Categorical	3, 5, 9
	3) billc (average of bill variables #4, #5)	Self-report; Categorical	3, 5, 9
Sample Item	*In the past 12 months, did you borrow money from friends or family to help pay bills?*		
Food hardship	1) In past 12 mo, receipt of free food/meals (yes/no)	Self-report; Binary	3, 5, 9
	2) Adult(s) cut size or skipped meals in the past 12 mo (3 Categories: often true – never true)*	Self-report; Categorical	3, 5
	3) Child skipped meal in the past 12 mo (3 Categories: often true – never true)*	Self-report; Categorical	3, 5
	4) Cut size of child's meal in the past 12 mo (3 Categories: often true – never true)*	Self-report; Categorical	3, 5
	5) Couldn't feed child balanced meals in the past 12 mo (3 Categories: often true – never true)*	Self-report; Categorical	3, 5
	6) Relied on low-cost food to feed children in the past 12 mo (3 Categories: often true – never true)*	Self-report; Categorical	3, 5
	7) Food bought didn't last in the past 12 mo (3 Categories: often true – never true)*	Self-report; Categorical	3, 5

Table 9

Constructs and Indicators of the Proposed Model

Construct	Indicator	Type	Time
Parcels	1) Fooda (average of food variables #2, #3, #6)	Self-report; Categorical	3, 5
	2) Foodb (average of food variables #4, #5, #7)	Self-report; Categorical	3, 5
Sample Item	*In the past 12 months, did you receive free food or meals?*		
Health hardship	1) Child/caregiver covered by private health insurance (yes/no)	Self-report; Binary	3, 5, 9
	2) Child/caregiver covered by Medicare/Medicaid (yes/no)	Self-report; Binary	3, 5, 9
Sample Item	*Are you or your child(ren) currently covered by a private health insurance plan?*		
Risk for child physical abuse			
Spanking	1) How often mother spanked child in past month (4 categories: every day – once or twice)*	Self-report; Categorical	3, 5, 9
	2) How often current partner spanked child in past month (4 categories: every day – once or twice)*	Self-report; Categorical	3, 5, 9
	3) How often father spanked child in past month (4 categories: every day – once or twice)*	Self-report; Categorical	3, 5, 9
	4) In the past month, has the mother spanked the child (yes/no)*	Self-report; Binary	3, 5, 9
	5) In the past month, has the mother's current partner spanked the child (yes/no)*	Self-report; Binary	3, 5, 9
	6) In the past month, has the father spanked the child (yes/no)*	Self-report; Binary	3, 5, 9
Physical aggression	7) Spanked him/her on the bottom with your bare hand (8 categories: a) once, b) twice, c) 3-5 times, d) 6-10 times, e) 11-20 times, f) more than 20 times, g) not in the past year, but it happened before, or h) this has never happened)*	Self-report; Categorical	3, 5, 9
	8) Hit him/her on bottom with something like a belt, hairbrush, a stick (8 categories: a) once, b) twice, c) 3-5 times, d) 6-10 times, e) 11-20 times, f) more than 20 times, g) not in the past year, but it happened before, or h) this has never happened)*	Self-report; Categorical	3, 5, 9
	9) Slapped him/her on the hand, arm or leg (8 categories: a) once, b) twice, c) 3-5 times, d) 6-10 times, e) 11-20 times, f) more than 20 times, g) not in the past year, but it happened before, or h) this has never happened)*	Self-report; Categorical	3, 5, 9
	10) Pinched him/her (8 categories: a) once, b) twice, c) 3-5 times, d) 6-10 times, e) 11-20 times, f) more than 20 times, g) not in the past year, but it happened before, or h) this has never happened)*	Self-report; Categorical	3, 5, 9
	11) Shook him/her (8 categories: a) once, b) twice, c) 3-5 times, d) 6-10 times, e) 11-20 times, f) more than 20	Self-report; Categorical	3, 5, 9

Table 9
Constructs and Indicators of the Proposed Model

Construct	Indicator	Type	Time
	times, g) not in the past year, but it happened before, or h) this has never happened)*		
CPS reports of child physical abuse	12) CPS investigated report of child physical abuse (yes/no)	Self-report; Binary	5, 9
Parcels	1) fatherspank (average of abuse variables #2, #3, #6)	Self-report; Categorical	3, 5, 9
	2) motherspank (average of abuse variables #1, #4, #5)	Self-report; Categorical	3, 5, 9
	3) abusea (average of abuse variables #7, #8, #11)	Self-report; Categorical	3, 5, 9
	4) abuseb (average of abuse variables #9, #10, #12)	Self-report; Categorical	3, 5, 9
Sample Item	*Sometimes children behave pretty well and sometimes they don't. In the past month, have you spanked (CHILD) because (he/she) was misbehaving or acting up?*		
Mediating Variables			
Parenting stress	1) Being a parent is harder than I thought (4 categories: strongly agree – strongly disagree)	Self-report; Categorical	3, 5, 9
	2) I feel trapped by my responsibilities as a parent (4 categories: strongly agree – strongly disagree)	Self-report; Categorical	3, 5, 9
	3) Taking care of my child is more work than pleasure (4 categories: strongly agree – strongly disagree)	Self-report; Categorical	3, 5, 9
	4) I often feel tired from raising a family (4 categories: strongly agree – strongly disagree)	Self-report; Categorical	3, 5, 9
Depression	1) Mother meets conservative estimate of depression (Computation based on 13 indicators)	Self-report; Continuous	3, 5, 9
Domestic violence	1) Current partner insults/criticizes you (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	2) Current partner tries to keep you from seeing/talking w/friends/family (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	3) Current partner tries to prevent you from going to work/school (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	4) Current partner withholds money (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	5) Current partner slaps/kicks you (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	6) Current partner hits w/a fist/object (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	7) Current partner tries to make you have sex that you don't want (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	8) Father insults/criticizes you (3 Categories: often –	Self-report;	3, 5, 9

Table 9

Constructs and Indicators of the Proposed Model

Construct	Indicator	Type	Time
	never)*	Categorical	
	9) Father tries to keep you from seeing/talking w/friends/family (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	10) Father tries to prevent you from going to work/school (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	11) Father partner withholds money (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	12) Father slaps/kicks you (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	13) Father hits w/a fist/object (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
	14) Father tries to make you have sex that you don't want (3 Categories: often – never)*	Self-report; Categorical	3, 5, 9
Parcels	1) dvparcela (average of domestic violence variables #5, #7, #9, #10, #13)	Self-report; Categorical	3, 5, 9
	2) dvparcelb (average of domestic violence variables #3, #4, #6, #8, #12)	Self-report; Categorical	3, 5, 9
	3) dvparcelc (average of domestic violence variables #1, #3, #11, #14)	Self-report; Categorical	3, 5, 9
Sample Item	*Now, think about how (FATHER) behaves towards you. For each statement I read, please tell me how often he behaves this way. He insults or criticizes you or your ideas. Does (FATHER) behave this way often, sometime, or never?*		

Figure 4. The final structural model.