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Examining the mediating role of family processes in the relationship between family income and mental health outcomes among young children involved in the child welfare system

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Examining the mediating role of family processes in the relationship between family income and mental health outcomes among young children involved in the child welfare system

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Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

In Partial Fulfillment

Of the requirements

For the Degree of

Doctor of Philosophy

The University of Texas at Austin

August 2012

DEDICATION

This dissertation is in dedication to my brother, Jonathan Berger, my husband, Cesar Cardoso and my sweet baby girl, Audrey Karina Cardoso. To my brother Jonathan, thank you for teaching me empathy, compassion and forgiveness. This dissertation is in honor of your life, courage, and faith. Cesar thank you for your love, sacrifice, and companionship throughout the years; I do not know a more self-less person. To my Audrey, you are my true love and best endeavor. Your laughter is my greatest joy and the best validation in my commitment to improve child health and well-being.

ACKNOWLEDGEMENTS

I would like to thank my committee, Yolanda Padilla, Alan Dettlaff, Rowena Fong, Robert Hummer, Jim Schwab and Sanna Thompson for their feedback and guidance during the dissertation process. I believe that my success is a reflection of the great mentorship I received from my committee members. I would like to express my deepest appreciation to Dr. Yolanda Padilla for her guidance and support during the last five years. Your mentorship is a blessing and I am so grateful to you for sharing your knowledge and experience. I would also like to thank Dr. Michelle Ballan at Columbia University. Ten years ago you were convinced that I would pursue a PhD and I did not believe you. Thank you for pushing me with your kindness. The completion of this study would not have been possible without funding from the University of Texas Graduate School and statistical support from Nathan Marti. Thank you, Nate for lending me your support during the extensive data analysis phase of this project.

I would not have made it through the dissertation process without the love, kindness and support of friends and colleagues. To my best friend, Joy Learman, thank you for teaching me how to be a better person. You are one of my greatest sources of inspiration—and an example of how human kindness and comparison can change people's lives. Monica Faulkner, thank you for your patience and belief in me. Your encouragement and generosity during this process, especially during my transition to motherhood, has meant a great deal to me. Rebecca Gomez, thank you for sharing your ideas and feedback with me. But, more importantly, thank you for believing in me when I

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lacked the necessary confidence in myself. I will always be grateful to you. To Holly Bell and Jeremy Goldbach, thank you for helping me keep a sense of humor—especially during the job hunt. To my friends in Santo Domingo, Ecuador, Ligia, Yadira, and Xavier Amay, I am forever indebted to you for inviting me into your home and culture. I can never repay you for teaching me that economic hardship does not define you as a person; rather it is how you treat others that will determine your worth. Finally, to my friends in New Orleans, Houston, New York and Portland, I know that I have neglected you over the past year. Thank you for understanding and valuing our friendship enough to take the initiative. I am so blessed to have you all as my friends.

I owe my success in life to my incredible family. To my father, Larry Berger, thank you for modeling a strong work ethic, honesty, responsibility and love. I do not know a more dedicated father; you have sacrificed so much of yourself to ensure my success and for that, you are my hero. I guess I should also thank you for making me sit on the bench during after several school programs to read—it got me ready for the PhD program. Thank you to my mother, Denise Clarke for always being on my side; for teaching me the value of education; and for being an incredible role model. I hope that I am able to be the kind of mother to Audrey that you are to me. Thank you to my sister, Carly Buhler for your understanding during the last five years. I know I have missed out on important things in your life; yet, you always reminded me that it was worth the sacrifice. I would like to honor my grandmother, Audrey Leroux. Thank you for showing me how to be a strong woman and a dedicated mother. Most importantly, thank you for

Examining the mediating role of family processes in the relationship between family income and mental health outcomes among young children involved in the child welfare system

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The negative relationship between economic hardship, child maltreatment, and development in young children is well-documented. However, few studies have examined the mechanisms underlying the link between economic hardship and poor developmental outcomes in children in the context of child maltreatment. In this study, the family stress model is used to understand how economic hardship affects the development of children in this population with a focus on mental health. According to this model, the effects of economic hardship on child mental health are indirect through family processes. Family processes are aspects of family life and are characterized by parental psychological functioning and parenting behavior. Because family processes are often why families become involved in the child welfare system, this framework can link developmental research and theory to analysis of child maltreatment. The current study analyzes data from the National Survey of Child and Adolescent Well-Being-II, a survey of families in the child welfare system. The sample included children ages 18 months to 11 years and their mothers (or caregivers). The results indicated that family economic hardship was significantly associated with mental health problems in children involved in

the child welfare system, but not in the way it was expected. Structural equation modeling analysis revealed no significant direct or indirect paths from economic hardship to child mental health, but showed that economic hardship affected other mechanisms contributing to poor child mental health. Greater economic hardship was associated with greater parental mental health problems, alcohol and drug use and physical abuse. In line with the family stress model, the relationship between parental mental health and child mental health was partially mediated through physical abuse. Likewise, physical abuse fully mediated the relationship between parental alcohol use and child mental health. In contrast, neglect did not mediate the relationship between family processes and child mental health. Contrary to the study's hypothesis, family processes did not mediate the relationship between economic hardship and child mental health. Rather, family processes predicted poor child mental health. In particular, physical abuse was an important vehicle through which parental functioning translated to poor mental health outcomes in children.

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CHAPTER 1: INTRODUCTION

1.1. Problem statement

In 2010, 3.6 million children were the subject of at least one maltreatment report. Among this group, approximately 695,000 of these children had a unique maltreatment report, while 754,000 had multiple maltreatment reports (U.S. Department of Health and Human Services, 2011). The consequences of child maltreatment during early childhood are often severe. In particular, experiences of physical abuse and neglect can affect children's ability to regulate and manage stress (Hagle, 2005; King, Mandansky, Flectcher & Brewer, 2001), which can result in chronic behavioral and mental health difficulties (Stirling & Amaya-Jackson, 2008). Research has suggested that as many as 80% of children involved in the child welfare system have clinically significant mental health problems (Burns et al., 2004; Farmer et al., 2001; Kortenkamp & Ehrl, 2002; Stahmer et al., 2005). Given the psychological costs associated with child maltreatment, understanding the mechanisms underlining child mental health outcomes among maltreated children is key (Jones-Harden & Klein, 2011).

Child maltreatment, most frequently defined by physical abuse and neglect, often occurs in the context of family risk factors, such as economic hardship, parental depression, substance use and impaired parenting (Pecora, Whittaker, Maluccio & Barth, 2007). Despite descriptive and exploratory research documenting the associations between these family dynamics and child outcomes, Jones Harden and Klein (2011) wrote in a special edition of *Children and Youth Services Review* that there remains a

limited understanding of how the "unique child welfare ecologies" (p. 1466) impact child development in young childhood and throughout the lifecycle. Furthermore, they advocated for research to address *how* family processes affect child welfare outcomes (Jones Harden & Klein, 2011).

Developmental researchers have used the family stress model (also called the family economic stress model) to understand the mechanisms through which economic hardship impacts child mental health. Conger and colleagues (1992) operationalized economic hardship to include family income, unstable employment income loss, and perceived financial strain. Other researchers have used measures of income (Yeung, Linver, & Brooks-Gunn, 2002), income-to-needs and poverty thresholds (Mistry, Biesanz, Taylor, Burchinalm, & Cox, 2004), perceived economic pressure (Mistry, Vandewater, Huston, & McLoyd, 2002), and material hardship (Gershoff, Aber, Raver & Lennon, 2007) to understand how family economic conditions affect child mental health. In the family stress model, economic hardship affects child mental health indirectly, through its influence on family processes. Because unhealthy family processes, which can lead to maltreatment, are associated with poor outcomes in the development of children (Conger et al., 1992), this framework can help link developmental research and theory to an analysis of child maltreatment

Few empirical studies in the child welfare literature have examined the mechanisms that translate economic hardship to poor child outcomes among children involved in the child welfare system. Using data from the National Survey of Adolescent

and Child Well-being II (NSCAW-II), the purpose of this study is to test the family stress model with an analysis of family income, family processes and child mental health among children involved in the child welfare system. This study will (a) examine the relationship between <u>family income</u> and <u>child mental health</u> among young children involved in the child welfare system, and (b) analyze the direct and indirect effects of <u>parental depression, alcohol use, drug use, and physical abuse and neglect</u> on <u>child mental health.</u> Finally, parental functioning is broadened to include other behavioral health measures. Expanding the family stress model to include substance abuse measures is important in the context of the child welfare system, where alcohol and drug use are often associated with a greater likelihood of out-of-home placement and poor child outcomes.

1.2 Economic hardship and child maltreatment

The etiology of child maltreatment is often understood as the interaction between contextual, parent and child risk factors (Pecora et al., 2007). Proximal factors, such as parental psychological well-being and parenting, have a direct impact on child maltreatment, while economic indicators are distal and impact child maltreatment indirectly (Cicchetti, Toth, & Maughan, 2000; Millet, Lanear, & Drake, 2011). Different theoretical frameworks offer similar and opposing perspectives on the degree, and by which mechanisms, that economic hardship contributes to child maltreatment. The fact economic measures do not fully explain why poor families are overrepresented in the

child welfare system (Slack, Holl, McDaniel, Yoo & Bolger, 2004) suggests an interaction effect between the characteristics of the person and the environment.

Data from community and child welfare samples have demonstrated a significant association between several measures economic hardship and child maltreatment. Findings from the National Incidence Survey-IV suggest that children in low income families experienced child maltreatment at five times the rate of children in higher income households (Sedlack et al., 2011). While it is worth noting that a causal relationship between economic hardship and child maltreatment has not been established (Berger, 2005; Crittenden, 1999), higher incidences of physical abuse and neglect have been linked to several economic indicators, including neighborhood poverty (Coulton, Korbin, & Su, 1999; Drake & Pandey, 1996; Wulczyn, 2011), income (Cancian, Slack, & Yang, 2010; Mistry et al., 2004.), unemployment (Sedlack et al., 2011), welfare receipt (Paxson & Waldfogel, 2003; Slack et al., 2004), material hardship (Gershoff et al., 2007), and family size and structure (Berger, 2004; Paxson & Waldfogel, 2003).

1.3. Parental depression, substance use and child maltreatment

Contextual factors affect child development indirectly through their influence on proximal factors, such as parental depression, substance abuse, and parenting behaviors. Researchers have often used measures of parental depression to operationalize parental functioning and well-being. There is a large body of research on the relationship between parental depression and harsh and disengaged parenting (Du Rocher Schudlich & Cummings, 2007; Lovejoy, Graczyk, O'Hare, & Nueman, 2000). In a study of young

infants, depressed mothers were more likely to be physically and verbally abusive to their children (Lyons-Ruth, Lyubchik, Wolfe, & Bronfman, 2002). Data using child welfare samples have yielded similar results. Parental depression was associated with a greater likelihood of neglectful parenting for children two to 15 years old (Mustillo, Dorsey, Conover, & Burns, 2011).

Similar to parental depression, researchers have examined the impact of substance use on child maltreatment (Berger, 2005; Chaffin et al., 1996; Keheller et al., 1994). Kelleher and colleagues (1994) found that parents with a lifetime drug or alcohol problem were 2.7 times more likely to report physical abuse and 4.2 times more likely to report neglect. Using a child welfare sample, Wash and colleagues (2003) found that physical abuse was two times higher for children whose parents reported substance use than parents who were non-substance abusers. Despite a strong association between substance use and child maltreatment, methodological limitations have left several unanswered questions about how substance use influences child maltreatment. A major limitation in the child welfare literature is that parental drug and alcohol use is often collapsed into a single measure of substance use. Therefore, it is unclear if drug and alcohol use affect child maltreatment type in different ways. Furthermore, states are not required to collect data on parental substance use (U.S. Department of Health and Human Services, 2011). As a consequence, the impact of substance abuse among child welfare involved families is unknown.

1.4. Consequences of parental depression and substance use for child mental health among children involved in the child welfare system

When children do not experience responsive relationships, or when they are met with harsh criticism and/or physical abuse or neglect, their social and emotional development can be adversely affected (Barth et al., 2007). This is reflected in the higher prevalence of mental health disorders in children involved in the child welfare system compared with those in the general population. Estimates on the number of children affected by mental health problems (including social, emotional and behavioral problems) have ranged from 27% to 80% (Burns et al., 2004; Framer et al., 2001; Kortenkamp & Ehrl, 2002; Stahmer et al., 2005); this is compared to 20% among children in the general population (U.S. Department of Health and Human Services, 1999).

Until recently, the majority of research has focused on the mental health outcomes of children in out-of-home care. However, two recent studies have highlighted the need for research on children who remain with their parents. Burns and colleagues (2004) found that clinical behavior exhibited by internalizing and externalizing problems affected approximately 47% of children who were not removed from their home. Parental functioning, measured by depression, was associated with higher mental health problems for pre-school and school-aged children. Likewise, substance abuse is associated with poor child mental health in the presence of child maltreatment (Dore, Doris, & Wright, 1995). Within the context of the child welfare system, the percentage of co-occurring disorders among caregivers (depression and substance abuse) is around 14% (Burns et al.,

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2009). Yet, despite the strong association between parental depression, maltreatment and child mental health, the mechanisms for understanding these relationships are unclear (Walsh, MacMillan, & Jamieson, 2003).

1.5. A conceptual model for understanding child mental health within the context of maltreatment

Overall research findings are consistent: children involved in the child welfare system are more frequently exposed to family and parental risk factors, such as economic hardship, parental depression, substance use, and impaired parenting, than are children in the general population. Literature in the area of child development can help us conceptualize the relationship between these risk factors. Given the strong association between these constructs, contemporary researchers are trying to disentangle *how* family economic hardship translates to poor child outcomes. One way of understanding the effects of economic hardship on child development is by examining the indirect (or mediating) effects of family processes.

A substantial body of research documents the importance of family processes in understanding the relationship between economic hardship and child mental health (Conger & Donnellan, 2007; Cummings, Keller, & Davies, 2005; Gershoff et al., 2007; Yeung et al., 2002). Family processes are aspects of family life characterized by parental psychological functioning and parental behaviors (Conger et al., 1992). In the family stress model, economic hardship, such as low income, unemployment, housing instability, and financial stress increase parental emotional distress affecting parental psychological functioning (Brenner & Kim, 2010; Conger et al., 1992). Poor parental

psychological functioning affects parent-child relations by increasing harsh, inconsistent and disengaged parenting practices (Belsky, 1984; Du Rocher Schudlich & Cummings, 2007; Mustillo et al., 2011). Ultimately, it is the poor parent-child relations that have an adverse effect on child development (Conger et al., 1992; Conger et al., 1994).

Although there is substantial research examining the family stress model among young children (Gershoff et al., 2007; Yeung et al., 2002) and adolescents (Conger et al., 1992; Conger et al., 1994), as well as with diverse groups (Mistry et al., 2002), the family stress model has not been examined with children who have been maltreated. Given that many of these risk factors, including low income, parental depression, substance use and parenting are related to why many families come to the attention of the child welfare system on allegations of child maltreatment, applying the family stress model in this context can increase our understanding of the effects on children. Furthermore, the family stress model is an example of a risk model. Risk models are often used to identify vulnerable groups (Wu et al., 2004) and can be helpful within the context of the child welfare system, as resources for providing services to children and families are often scarce.

1.6 Current study

There is little understanding about how economic hardship and family processes, namely parental depression, substance use, and impaired parenting affect children involved in the child welfare system. Furthermore, the family stress model has largely assessed parental functioning by using measures of depression; other behavioral health

measures, such as alcohol and drug use, have not been included. Therefore, the goal of this study is two-fold. First, this study will increase our understanding about the relationship between family income (a measure of economic hardship), family processes, and one key aspect of child outcomes, mental health, in the context of the family stress model. Second, within this conceptual model, definitions of parental functioning will be broadened to include measures of parental alcohol and drug use. Figure 1.1 presents a logic model that summarizes previous research, unanswered questions, and the purpose of the current study.

1.5.1 *Research aims, questions and study hypotheses*

Using cross-sectional data from the National Survey of Adolescent and Child Well-Being-II, the current study analyzed a sample of children, 18 months to age 11, living with their mothers or other permanent caregivers. The study aims, research questions and study hypotheses are listed below (see Table 1.1 for a summary).

Aim 1:

To provide a descriptive analysis of child mental health, including variations by family income and family processes.

Research question 1: What are the mental health outcomes of young children involved in the child welfare system?

Study hypothesis 1A: Children in the child welfare system will have a higher rate of mental health problems compared to the general population.

Research question 2: How do mental health outcomes vary by family income and family processes among children in the child welfare system?

> *Study hypothesis 2A: Children whose parents report lower income-to-needs will experience greater mental health problems; although this relationship will be weak.*

> *Study hypothesis 2B: Family income-to-needs will be negatively associated with parental depression, alcohol use and drug use; such that lower income families, with a higher household size, will have a higher prevalence of these risk factors.*

Research question 3: What is the association between family income, parental depression, alcohol use, drug use and physically abusive and neglectful parenting?

> *Study hypothesis 3A: Family income-to-needs will be negative associated with physically abusive and neglectful parenting.*

> *Study hypothesis 3B: Parental depression, alcohol use, and drug use will be associated with a higher incidence of physically abusive parenting.*

> *Study hypothesis 3C: Parental depression, alcohol use and drug use will be associated with a higher incidence of neglectful parenting.*

Aim 2:

To conduct multivariate analyses to test the direct and indirect effects of family processes on the relationship between family income and child mental health outcomes.

Research question 1: Which aspects of family processes mediate the relationship between family income and child mental health?

Study hypothesis 1A: The relationship between family income (as measured by income-to-needs) and child mental health will be mediated by parental depression, alcohol use, drug use, physically abusive and neglectful parenting.

Research question 2: Does child maltreatment (defined as physically abusive and neglectful parenting) mediate the relationship between measures of parental mental health, alcohol use, drug use and child mental health?

Study hypothesis 2A: The relationship between parental depression, alcohol use, drug use, and child mental health will be mediated by physically abusive parenting.

Study hypothesis 2B: The relationship between parental depression, alcohol use, drug use, and child mental health will be mediated by neglectful parenting.

Figure 1.1: Research goals and logic

Research shows a negative relationship between economic hardship and child development in young children. Yet, there is a growing body of research indicating that this direct relationship is weak and can be better understood by examining the role of family processes. Family processes are defined as aspects of family life that affect parent-child interactions. Financial pressures tax parental well-being, which contributes to more coercive and neglectful parenting. It is through these mechanisms that economic hardship is translated to poor child outcomes.

Research has highlighted the association between economic hardship, parental depression, impaired parenting and child mental health. Additionally, indicators of economic hardship are often associated with greater substance abuse. However, there is little research on how drug and alcohol abuse act distinctively as a vehicle to poor child mental health outcomes.

It is expected that: Family income, which is the measure of economic hardship used in this study, will have a negative effect on child mental health. However this relationship will be weak and largely explained by the effects of income on parental depression, alcohol use and drug use. Consequently, this will increase physically abusive and neglectful parenting, which will increase mental health problems in young children.

Research findings are unclear about: Whether family processes mediate the relationship between family economic hardship and child mental health for children involved in the child welfare system. Furthermore, parental depression has been identified as a strong mediator between measures of economic hardship and child development, as well as a predictor of impaired parenting. However, it is unclear if other aspects of parental functioning, such as drug and alcohol abuse, affect child outcomes in a similar way.

Why important? Until recently, studying the direct and indirect effects of parental depression, alcohol abuse and drug abuse through physically abusive and neglectful parenting has not been possible with national data. Understanding the role of family processes among children with child welfare involvement is critical, as it is often family processes that bring children to the attention of the child welfare system. Within the context of the child welfare system, identifying high risk kids is an important step to preventing re-victimization.

This study will fill a gap by determining whether the mechanisms that translate family income to child mental health apply to children involved in the child welfare system as it does to children in the general population.

To do so, the study will analyze NSCAW-II data to (a) examine the relationship between family income, family processes and child mental health outcomes (b) examine the direct and indirect effects of parental depression, alcohol use, drug use and physically abusive and neglectful parenting on child mental health outcomes among children involved in

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Table 1.1.Research aims, questions, and study hypotheses

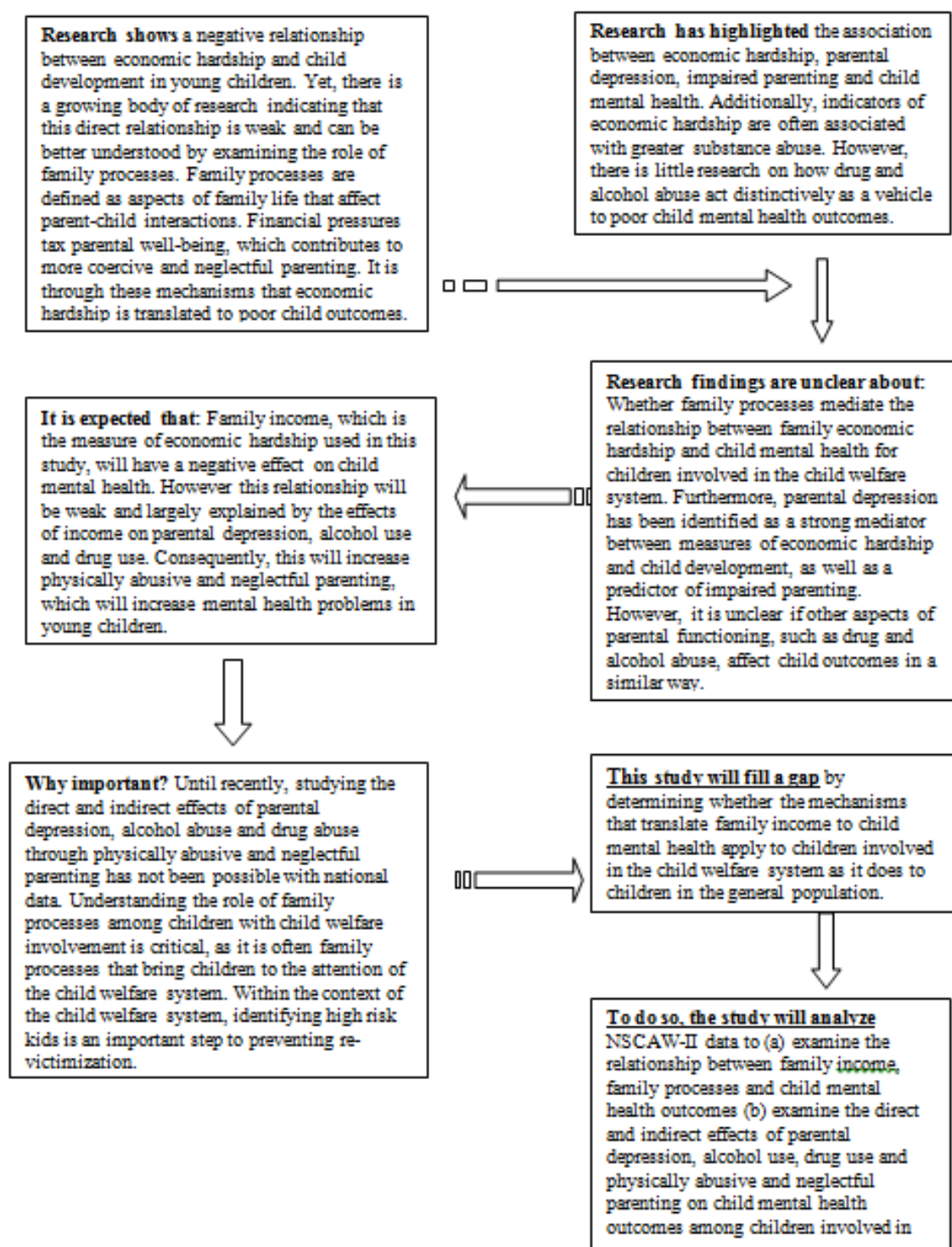| Aim 1: To provide a descriptive analysis of child mental health, including variations by family income and family processes	R1: What are the mental health outcomes of young children involved in the child welfare system?	1A: Children in the child welfare system will have a high rate of mental health problems.
	R2: How do mental health outcomes vary by family income and family processes?	2A: Greater mental health problems will be experienced by children living in households with a lower income-to-needs ratio; although this relationship will be weak.
		2B: Children whose parents demonstrate higher rates of parental depression, alcohol use and drug use will be more likely to experience mental health problems.
	R3: What is the association between family income, parental depression, alcohol use, drug use, and physically abusive and neglectful parenting?	3A: Family income will be negatively associated with physically abusive and neglectful parenting.
		3B: Parental depression, alcohol use, and drug use will be associated with a higher incidence of physically abusive parenting.
		3C: Parental depression, alcohol use, and drug use will be associated with a higher incidence of neglectful parenting.
Aim 2: To conduct multivariate analyses to test the direct and indirect effects of family processes on the relationship between family income and child mental health outcomes	R1: Which aspects of family processes mediate the relationship between family income and child mental health?	1A: The relationship between family income and child mental health will be mediated by parental depression, alcohol use, drug use and physically abusive and neglectful parenting.
	R2: Does child maltreatment (defined as physically abusive and neglectful parenting) mediate the relationship between parental depression, alcohol use, drug use, and child mental health?	2A: The relationship between parental depression, alcohol use, drug use, and child mental health will be mediated by physically abusive parenting.
		2B: The relationship between parental depression, alcohol use, drug use and child mental health will be mediated by neglectful parenting.

CHAPTER 2: LITERATURE REVIEW

A large body of literature documents the effects of economic hardship on child maltreatment. One limitation in the child welfare literature is that few studies have illuminated the mechanisms or pathways in which contextual (e.g., family income) and parental risk factors (e.g., parental depression, alcohol use, drug use and impaired parenting) increase the likelihood of physical abuse and neglect. Within the context of the child welfare system, which is the focus of this study, it is unclear how family income, parental functioning and parenting behaviors affect child mental health.

Maltreatment during infancy and early childhood can complicate development, particularly in the area of child mental health. Experiences of physical abuse and neglect can affect children's ability to regulate and manage stress (Hagele, 2005; King et al., 2001). This leads to complex difficulties (Sullivan & van Zyl, 2008), including poor emotional recognition (Pollack, Cicchetti, Hornung, & Reed, 2000), and negative or insecure attachments (Cicchetti & Barnett, 1991; Stirling & Amaya-Jackson, 2008) and compromised adaptive and/or social competence (Casanueva, Cross, Ringeisen, 2008; Helton, 2011). Over time, psychological complications, which begin in childhood, can manifest chronic difficulties across the life cycle (Stirling & Amaya-Jackson, 2008).

The etiology of child maltreatment is often viewed within an ecological framework. From this perspective, understanding individual, family and contextual risk factors is critical to the prevention of child maltreatment, as well as to our understanding of early childhood developmental processes among children in the child welfare system.

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While maltreatment often occurs during the developmental period in children's lives, most child welfare research is not grounded in a developmental perspective (Cicchetti et al., 2000). The family stress perspective —a conceptual framework for understanding the mechanisms through which economic hardship impacts child mental health—ties together child development and child maltreatment literature by emphasizing the direct and indirect effects of economic hardship and family processes on child developmental outcomes.

This chapter covers three broad areas. I begin by defining child maltreatment, describing the child welfare system and its philosophical underpinnings, critically analyzing the discourse on the etiology of child maltreatment, and identifying correlates of child maltreatment. This background information is essential to understanding the context of the current study, as children in the child welfare system are a subset of children from the general population and of children who experience child maltreatment. Second, I bring a developmental perspective to the analysis of the child welfare system by focusing on the effects of maltreatment on child mental health, as well as describing the relationship between economic hardship, family processes and child mental health. Finally, I introduce the family stress model and discuss its application to children and families involved in the child welfare system.

2.1 Defining child maltreatment in the context of the U.S. child welfare system

In the United States, the child welfare system sets the definition of child maltreatment. Federal legislation over the last fifty years, starting with the Child Abuse

Prevention and Treatment Act of 1974 (PL 93-247), has aimed to address issues related

to the identification and treatment of child maltreatment. Although experts do not agree

on a single definition of child abuse and neglect (Slack et al., 2004), one of the most cited

definitions of child maltreatment can be found in the Child Abuse and Prevention

Treatment Act (CAPTA) reauthorization of 2003. In the reauthorization of CAPTA (U.S.

Department of Health and Human Services, 2003), child abuse and neglect were defined

as:

> at a minimum any recent act or failure to act on the part of a parent or caretaker,
>
> which results in death, serious physical or emotional harm, sexual abuse or
>
> exploitation, or an act or failure to act which presents imminent risk of serious
>
> harm (pg.45)

Major forms of maltreatment under CAPTA include: emotional abuse, neglect (physical,

educational, emotional), physical abuse, and sexual abuse (P.L.111-320). CAPTA

reauthorization was part of the federal legislation, Keeping Children Safe Act (PL 108–

36), which aimed to expand interdisciplinary research programs on child maltreatment,

create linkages between child welfare service agencies and agencies that provide direct

services to children and families, and mandate states to provide early intervention

services to young children in confirmed maltreatment cases (U.S. Department of Health

and Human Services, 2003).

Although states use statutory definitions of maltreatment to guide investigations and substantiation, there is significant subjectivity by screeners and caseworkers that influence case outcomes (Pecora et al., 2007). Research suggests that culture influences parenting styles and perceptions of abuse (Fontes, 2002; Korbin, Coulton, Lindstrom-Ufuti & Spilsbury, 2000; McLoyd, 1990). For example, Latino culture emphasizes key factors, such as obedience, respect and family loyalty. When children disobey, Latino parents may respond with harsh, and sometimes, corporal forms of discipline (Fontes, 2002; Zayas & Solari, 1994). Statutory definitions of abuse do not consider cultural perceptions of discipline or neglect. Yet, child welfare agencies and national advocacy groups encourage cultural competence in working with families (McPhatter & Woodroffe, 2005). Despite the emphasis on cultural competence, caseworkers are not free from racial, ethnic and cultural biases. These biases likely, on some level, contribute to who is investigated for abuse and the thresholds determined for substantiation (Dettlaff et al., 2011; Tumlin & Geen, 2000).

2.1.1 The approach of child welfare agencies to investigating maltreatment

The mission of the public child welfare system is anchored in child protection and safety—"it is the right of children to grow-up free of physical, sexual, emotional and other forms of harm by their parents or caregivers" (Pecora et al., 2007, p. 4). Above all, contemporary child welfare services are aimed at protecting children from harm. Child welfare agencies are responsible for investigating child maltreatment and responding to the needs of children and families. Other key target goals include family preservation

(birth-family or relative/adopted family units) and the promotion of child well-being and development (Pecora et al., 2007). Pecora and colleagues (2007) suggest that the underlining philosophy of contemporary child welfare services is an emphasis on child safety, but also on child and family well-being, family centered services, cultural competence, and system accountability.

Which families receive, or perhaps need, child welfare services is often a source of great debate. Maltreatment reports typically come to state child welfare agencies via reporting hotlines. The initial referral is followed by several exit points in the child welfare system. After a report is made, there is a screening process that occurs in which a decision to investigate is made. Although all states have screening policies, most states do not have formal guidelines for determining whether to investigate a case (Tumlin & Geen, 2000). However, once an initial report is accepted and a decision to investigate has been made, a caseworker will contact the child and family and assess present and future level of harm (Pecora et al., 2007). The caseworker is also responsible for determining the evidence of maltreatment. If the level of risk to the child is high, the child may be removed from the home to prevent future maltreatment and provide services to the family to reduce the risk of future maltreatment. In cases where safety concerns are present, but those concerns do not warrant removal from the home, prevention/treatment services are provided to the child and family while the child remains in the home. Progress is evaluated until the case is closed or until the safety status of the child changes. If the

status of the case changes, the placement in out-of-home care is reconsidered (Pecora at al., 2007).

The literature suggests that the overrepresentation of racial and ethnic minority children exists at each stage of the child welfare process—starting with the initial report, followed by decisions to place the child in out-of-home care and eligibility of services (Chapin Hall Center for Children, 2008). Rates of maltreatment reports and substantiation for non-Hispanic black children are twice the rate compared with those for non-Hispanic white children (Drake, Jolly, Lanier, Flute, Barth & Jonson-Reid, 2011). Likewise Church and colleagues (2005) found that Hispanic children were more likely to be substantiated for abuse and removed from their home for longer periods of time than were non-Hispanic white children. Although it is a reality that children of color are disproportionately represented in maltreatment reports, as well as in the numbers of children removed from their homes (Chapin Hall Center for Children, 2008), there is limited insight about how "ecological factors" contribute to these differences (Jones Harden & Klein, 2011, p. 1464). In the following section, theoretical perspectives regarding the etiology of child maltreatment, as well as correlates of maltreatment will be explored.

2.2 The etiology of child maltreatment

It is difficult to identify which set of factors cause maltreatment. Given this difficulty, researchers will often examine maltreatment within a conceptual framework. Pecora and colleagues (2007) identified four theoretical perspectives that guide the

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discussion on the etiology of maltreatment. In the psychiatric/psychological perspective, parental mental illness and personality traits are the major cause of maltreatment. These traits, which developed as a result of childhood dysfunction, contribute to a parent's inability to nurture and care for their child. There is evidence to suggest that maternal depression impairs parenting (Lyons-Ruth et al., 2007; Mustillo et al., 2011). Parental depression has been found to have a strong correlation with harsh or disengaged parenting (Lovejoy et al., 2000)—which at an extreme, could constitute child maltreatment. However, a major limitation to this perspective is that not everyone who suffers from a psychiatric illness abuses their children, just as not every maltreatment case involves a mentally ill parent. Perhaps the strongest piece of evidence challenging this perspective is that personality characteristics in parents are not the only agent predicting child abuse, especially in the presence of other psychosocial risk factors (Pecora et al., 2007).

The sociological perspective highlights the relationship between social, structural and environmental stresses and child maltreatment. In this perspective, the accumulation of stress resulting from societal norms about violence, socioeconomic status, unemployment, race/ethnicity, housing, adolescent parenting, family structure and size, and social isolation are factors contributing to child maltreatment. These factors isolate families from social supports and resources, which creates greater strain on families. The basic premise of this perspective is to remove the blame of maltreatment from the parent and deflect it back to the society. To decrease child maltreatment, policy makers should

focus on the large social barriers—access to resources, unemployment, housing—that stress family systems and make them vulnerable to violence (Pecora et al., 2007).

The third perspective, the <u>social-situational model</u>, conceptualizes the etiology of child maltreatment by focusing on characteristics of the perpetrator and child and the interaction between the two. The focus is on how child characteristics like, temperament, physical and mental disabilities, low-birth weight/prematurity, etc. affect the parent-child relationship. In this model, it is both personality traits of the parent and the child that place the child at risk for maltreatment. For example, there is some evidence to suggest that low-birth weight infants (Wu et al., 2004) and children who have disabilities (Stahmer et al., 2005) are at an increased risk for child maltreatment and placement disruption (Helton, 2011) because they add additional strains on their caretakers. These strains may interfere with the parent's ability to form positive attachments with the child (Pecora et al., 2007).

The final perspective, known as the <u>ecological or integrative perspective</u>, includes theoretical tenants from the previously described conceptual frameworks (Pecora et al., 2007). In this framework, the etiology of child maltreatment is best examined by understanding the contributions of contextual, parental and child domains (Wulczyn, 2009). The *parent contribution* in the etiology of child maltreatment has largely focused on parenting skills and parental functioning—or psychological well-being (Belsky, 1984). Disturbances in parental well-being are related to negative, harsh, and disengaged parenting, which are characteristics of abuse and neglect (Du Rocher Schudlich &

Commings, 2007; Mustillo et al., 2011). *Child contributions* are said to shape the parent-child interactions (Belsky, 1984, 1993; Wulczyn, 2009). Child temperament in particular is related to difficulty in parenting and can undermine parental functioning (Belsky, 1984, 1993). Finally, *contextual factors,* such as poverty, material hardship and neighborhood environment are said to interact with parent and child characteristics to affect parent-child interactions. For example, chronic poverty can lead to greater neighborhood disorganization and segregation. This can limit parents' access to social supports and resources, which increase the burden and strain on parents, and thus negatively affect parent-child interactions (Wulczyn, 2009). Using an ecological perspective is particularly important with minority and low income populations (Garcia & Coll, 1990; McLoyd, 1990; Ortega et al., 2010) who often face multiple social and structural challenges that impact their psychological well-being. With advances in statistical methods, contemporary researchers are able to examine the etiology of maltreatment using integrative approaches that allow for the inclusion of individual, family and environmental risk factors.

2.3 The role of economic hardship in child maltreatment

2.3.1 Theoretical overview

Within the ecological perspective, child maltreatment occurs from the interaction of individual characteristics and the environment (Pecora et al., 2007). Proximal factors, such as family, have a direct effect on the likelihood of child maltreatment. However, distal influences, such as community and neighborhood level factors, impact child

maltreatment indirectly through factors such as parenting or parental depression (Cicchetti et al., 2000; Millett et al., 2011). Figure 2.1 demonstrates the relationship between proximal and distal factors and child maltreatment.

Figure 2.1: The interaction between proximal and distal causes of maltreatment

Distal causes: low income, neighborhoods state policies, financial strain — Proximal causes: parental depression, substance abuse, and parenting → Child maltreatment
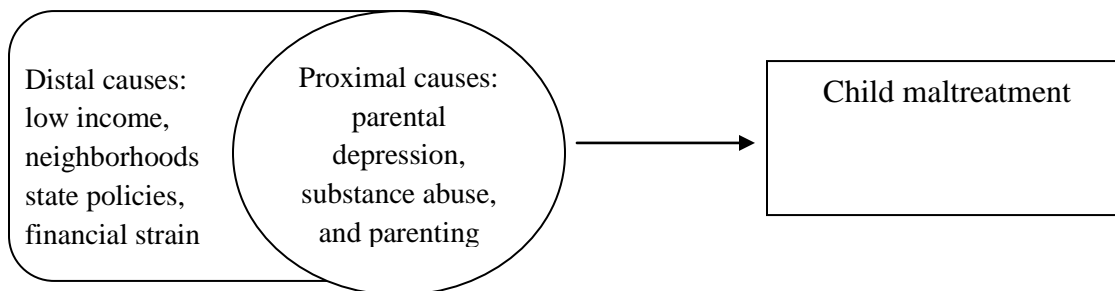
Additionally, maltreatment type is largely a function of the environmental factors that increase the prevalence and risk of abuse. For example, the prevalence of neglect will largely be found in poor communities that are characterized by high unemployment and limited resources (Chaffin, Kelleher, & Hollenberg, 1996).

Another perspective guiding research on child maltreatment is stress theory. According to this perspective, poverty exposes families to chronic stress, such as single parenthood, low income and poor educational resources. These factors have a negative impact on parental depression and functioning (Conger et al., 1994; Conger et al., 1995; Gershoff et al., 2007). Consequently, these stresses diminish parents' ability to be supportive and nurturing. Assuming that maltreatment is a function of economic stress, reducing the number of low income families would likely decrease the incidence of child

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maltreatment (Pecora et al., 2007). From a slightly different angle, community and neighborhood explanations of maltreatment focus on social disorganization and neighborhood processes. The lack of organization, collective efficacy and resources create environmental stressors and these negative stressors are transmitted to the parent-child transactions in the home (Coulton, Crampton, Irwin, Spilsbury & Korbin, 2007).

Within the child welfare literature, there is a body of literature questioning whether the overrepresentation of poor children in the child welfare system is related to reporting bias. One possible explanation is that poverty is co-morbid with other individual and family risk factors and, as a result, these families experience greater needs (Jonson-Reid, Drake, & Kohl, 2009). Another explanation is that being poor increases contact with social service agencies. Therefore, it is not poverty that elevates an individual's risk of maltreatment; rather, it is that they are more likely to be identified through a social service organization than are families that do not need or access social services (Pecora et al., 2007).

At least to some degree, all of these factors explain some of the relationship between poverty and child maltreatment. The fact that economic measures do not fully explain why low income families are overrepresented in their child welfare involvement (Slack et al., 2004; Wulczyn, 2009) lends some support to the influence of person-in-environment. What is unknown at this point is how much of the relationship between poverty and child maltreatment can be attributed to characteristics of the individual or the

environment or the systemic/caseworker biases that influence the identification and decision making processes.

2.3.2 Empirical overview

The rates of poverty and economic hardship are extremely high among families involved in the child welfare system. Although no causal link between economic indicators and child maltreatment has been established (Berger, 2005; Crittenden, 1999), the relationship between poverty and child welfare involvement is well documented. In particular, research has found that family income (Cancian, et al., 2010; Mistry et al., 2004.)**,** parental unemployment (Jones & McCurdy; Sedlack et al., 2011), welfare receipt and material hardship (Paxson & Waldfogel, 2003; Shook, 1999; Slack et al., 2004; Slack et al., 2011) and family size and structure (Paxson & Waldfogel, 2003; Wu et al., 2004) are associated with higher child welfare involvement. Slack and colleagues (2004) found that parental underemployment and perceived material hardship were associated with a higher incidence of slapping. Work by Paxson and Waldfogel (2002, 2003) addressed the macro-economic impact of poverty on state maltreatment rates post welfare reform. They found two major findings: first, increased poverty rates contributed to a higher number of substantiated maltreatment reports; and second, states with decreased welfare benefits and stricter lifetime caps and sanctions had a higher number of children in out-of-home placements (2002, 2003).

Yet, perhaps the strongest evidence on the relationship between poverty and child maltreatment comes from the National Incidence Survey (NIS)-IV—a national survey

estimating maltreatment rates in the general population. The NIS-IV study found several indicators of family economic status associated with child maltreatment (Sedlack et al., 2011). Parents who were not in the labor force reported physical abuse at two times the rate, and neglect at three times the rate, of parents who were in the labor force. Overall, children in low income homes were found to experience maltreatment at five times the rate compared with children in higher income families (Sedlack et al., 2011). It is worth noting that the large amount of missing data on socioeconomic indicators, and in particular family income (68% missing), may threaten the validity of these statistical estimations.

Several studies have also emphasized the role of neighborhood and concentrated poverty on maltreatment rates (Coulton et al., 1999; Drake & Pandey, 1996; Wulczyn, 2011). Using aggregate state-level data, Drake and Pandey (1996) explored how neighborhood poverty influenced maltreatment rates and type. They found that neighborhood poverty was associated with physical and sexual abuse, as well as childhood neglect—but neighborhood poverty was more strongly associated with childhood neglect. Kim (2004), on the other hand, found that socioeconomic status and a high crime rate were associated with childhood neglect but not physical abuse. Coulton and colleagues (1999) used hierarchical linear modeling to differentiate individual-level and community-level risk factors on child abuse potential. They found that structural aspects of the neighborhood, such as the degree of impoverishment and child care burdens, were associated with an increase in child abuse potential—although the effects

were much weaker than hypothesized. Moreover, the study found that child abuse

potential was greater within, rather than between, neighborhoods. This finding suggests

that neighborhood context may weaken individual-level protective factors and heighten

individual-level risk factors (Coulton et al., 1999).

Further complicating the relationship between poverty and maltreatment is the

influence of race and ethnicity (Wulczyn, 2011). This is fueled by a lack of understanding

about how to interpret the relationship between poverty, race and child welfare

involvement. Widely discussed in the child welfare literature is the reality that children of

color are disproportionately represented in maltreatment reports, as well as in the

numbers of children removed from their homes (Chapin Hall Center for Children, 2008).

Factors associated with low socioeconomic status are frequent predictors of maltreatment

across racial and ethnic groups (Pecora et al., 2007).

At the aggregate level, the influences of state and county poverty rates on

maltreatment vary by race (Freisthler, Bruce & Needell, 2007; Wulczyn, 2011). Wulczyn

(2011) found that the rates of maltreatment for non-Hispanic white children increased as

white poverty in the state increased, whereas the rates of child maltreatment for non-

Hispanic black families decreased as poverty increased. Using geospatial mapping,

Freisthler and colleagues (2007) found that only the percentage of persons living in

poverty by zip code was consistently associated with child maltreatment rates for non-

Hispanic white, non-Hispanic black and Hispanic parents. The statistical effects of other

economic indicators, such as percentage of unemployment, female headed households,

ratio of children under 12, and alcohol outlets, varied significantly by race/ethnicity.

Therefore, steps to reduce neighborhood poverty may need to be tailored to address

specific demographic characteristics of racial and ethnic groups (Fraisthler et al., 2007).

In an examination of individual-level poverty and race, Dettlaff and colleagues

(2011) found that race was not a strong predictor of maltreatment substantiation after

controlling for income. However, once caseworker's assessment of risk was included in

the analysis, race rather than income predicted decisions to confirm allegations of

maltreatment (i.e., maltreatment substantiation). These findings suggest that poverty

played an important role in determining risk, but race was a stronger influence on the

caseworker's decision to substantiate (Dettlaff et al., 2011). These results support the

suspicions by Tumlin and Geen (2000) that caseworker's thresholds for maltreatment

substantiation varied by the family's race/ethnic status.

On the other hand, using child welfare and census tract data, Jonson-Reid and

colleagues (2009) compared individual- and family-level risk factors between poor

children in a child welfare sample to those in a poor, non-maltreated sample from the

general population. A greater percentage of parental mental illness and child risk factors

were found in poor families with child welfare involvement compared with poor families

in the general population. They concluded that greater need, rather than bias, was the

driving factor for the overrepresentation of poor children in child welfare caseloads.

Although there are a range of economic indicators that predict child welfare involvement,

there is not a single marker or determinant of maltreatment. Rather, it is a combination of these markers that increase a child's risk for maltreatment (Cadzow, Armstrong, & Fraser, 1999) and these risks seem to differ by maltreatment type (Chaffin et al., 1996; Drake & Pandey, 1996; Jones & McCurdy, 1992; Kelleher et al., 1994).

2.4 Risk factors for child maltreatment: Differences by physical abuse and neglect

The literature identifies several forms of child maltreatment. This section will focus broadly on the two most common types of abuse: physical abuse and neglect (Sedlack, et al., 2011). Physical abuse can generally be defined as "a nonaccidental injury to a child" (Pecora et al., 2007, p. 152). The degree of injury to a child is a vague definition and generally left to the judgment of the caseworker. Related, is the definition of corporal punishment. Straus (1994) defines corporal punishment as "the use of physical force with the intention of causing a child to experience pain, but not injury, for the purpose of correction or control of the child's behavior" (p. 4). Of key distinction in the two definitions above, is the focus on injury to the child. Physical abuse is characterized by injury to a child. Whereas, corporal punishment (also known as physical discipline) may be an appropriate and acceptable form of discipline when used moderately—especially in some racial and ethnic groups (see Tomas & Dettlaff, 2011 for a review of corporal discipline in African Americans families and Fontes, 2002 for a review of corporal punishment in Latino families).

The definition of childhood neglect, as with physical abuse, is also vague. Neglect is more difficult to identify and substantiate because the consequences are often

not as visible as in the case of physical abuse. This category includes physical, medical, environment or emotional neglect, as well as inadequate supervision and newborns addicted and exposed to drugs (DePanfilis, 2006). The CAPTA amendment defines childhood neglect as:

> any recent act or failure to act on the part of a parent or caregiver, which results in death, serious physical or emotional harm, sexual abuse or exploitation, or an act or failure to act which presents an imminent risk of serious harm (P.L. 108-36).

Childhood neglect is the most common form of maltreatment in the United States (Sedlack et al., 2011; U.S. Department of Health and Human Services, 2011). In 2010, there were around 695,000 unique victims of child abuse; and more than 75% of the children suffered from neglect. Neglect accounted for 30% of maltreatment fatalities (U.S. Department of Health and Human Services, 2011). Within the context of child neglect, physical neglect-or failure to provide a child with basic necessities, such as food, clothing, shelter, etc.-accounted for the majority of cases (American Humane Association, 2003). Following child neglect, physical abuse is the second leading type of child maltreatment in the United States (Sedlack et al., 2011). In 2010, more than 15% of all maltreatment investigations were because of suspicion of physical abuse (U.S. Department of Health and Human Services, 2011). Although there is a large body of research that examines maltreatment as a general condition (Cadzow et al., 1999; Freisthler et al., 2007; Wu et al., 2004), some researchers suggest that the correlates of child maltreatment may differ by maltreatment type (Chaffin et al., 1996; Famularo,

1994; Kelleher et al., 1994); that is, factors that predict neglect are different to those that predict physical abuse.

In an examination of demographic, family and contextual risk factors on the prevalence of physical abuse and neglect, Chaffin and colleagues (1996) and Kelleher and colleagues (1994) found that there was virtually no overlap in predictors of physical abuse and neglect. From a slightly different angle, Hildard and Wolfe (2002) conducted a literature review on the impact of child neglect on developmental outcomes in children— concentrating on studies that allowed for a comparison between physical abuse and neglect. They found that relative to physical abuse, the effects of neglect were more severe in the area of academic achievement, cognitive development, peer interactions, and internalizing (as opposed to externalizing) symptoms (Hildard & Wolfe, 2002). Given these findings, contemporary research should differentiate child maltreatment type when examining the developmental outcomes of children. Within the ecological perspective, this would involve examining how social context and parental and child risk factors impact the likelihood of physical abuse and neglect separately.

2.4.1. Contextual factors associated with physical abuse and neglect

<u>Physical abuse</u>. There is a large body of research examining the relationship between family and neighborhood poverty and physical abuse (Cadzow et al., 1999; Chaffin et al., 1996; Coulton et al., 1999; Drake & Pandey, 1996; Wu et al., 2004). Despite a growing interest in using aggregate-level data to examine the effects of poverty on maltreatment, there is little consensus in the literature about how county- and state-

level poverty indicators effect physical abuse. Several researchers have examined aggregate state-level poverty indicators to better understand the effects of poverty on physical abuse rates. Gillham and colleagues (1998) found that male unemployment—above all other indicators of economic deprivation—was associated with elevated child physical abuse rates. However, in a more recent study conducted in the United States, Millet and colleagues (2011) found no relationship between state unemployment rates and physical abuse rates.

Moving from state-level data to neighborhood poverty rates, Drake and Pandey (1996) found that the percentage of families in poverty, median property value, and percentage of two-parent families in each zip code was correlated with higher physical abuse rates. Similarly, Chaffin and colleagues (1996) found that residential property values, low percentage of two-parent families and percentage of families in poverty were associated with higher reports and substantiated cases of physical abuse. Additionally, they stratified the neighborhoods by level of poverty (low, medium and high) and found that the association between socioeconomic status and physical abuse was stronger in zip codes with the highest poverty thresholds. Given these findings, Chaffin and colleagues (1996) concluded:

> …studies exploring maltreatment across economic class must distinguish between subtypes of abuse. This is because the rates of different types of maltreatment vary across class lines. If unitary maltreatment categories are used then

researchers will probably be comparing mostly neglect reports in poor areas to mostly abuse reports in more affluent areas (p.1015).

Findings on the effects of neighborhood poverty on physical abuse rates have largely focused on urban metropolitan areas. However, large community studies, such as the NIS-III and NIS-IV studies, have expanded our understanding about the relationship between poverty and physical abuse by including smaller geographical areas. Analyses of these data indicated that rates of physical abuse, as well as degree of child endangerment, were statistically *lower* in urban metropolitan areas compared with rural areas (Sedlack et al., 2011)—that is, proportionally, rural areas had higher rates of physical abuse reports than did urban metropolitan areas. One major disadvantage of neighborhood-level analyses is the issue of selection. Typically, people are selected into neighborhoods based on other characteristics, such as income, education, and race/ethnicity. As such, it has been difficult to decipher the "true" neighborhood effects on physical abuse rates. Given the difficulty researchers face in studying neighborhood effects on physical abuse most studies have used family/individual-level variables as the unit of analysis.

Research on the effects of family income on child physical abuse rates is mixed. For example, Berger (2004) found that income was significantly associated with increased spanking and decreased quality in the home environment. However, after controlling for a number of risk factors, such as substance abuse and low-birth weight, the strength of relationship between income and spanking was reduced—such that it was no longer statistically significant. In a separate study, Berger (2005) modeled the impact

of income on physical abuse by family structure. After controlling for depression, alcohol consumption and history of family violence, income remained a significant predictor of physical abuse in single-parent families but not in two-parent families (Berger, 2005). This latter finding was corroborated in several studies by Paxson and Waldfogel (2002, 2003), where single motherhood (or absentee fathers) had a greater impact on physical abuse rates than on other forms of maltreatment. They concluded that children in single parent families may be at a greater risk for physical abuse because of the additional stress associated with single motherhood, but also because single mothers have fewer resources, which may increase the likelihood of being placed in the care of others that may physically abuse them (Paxson & Waldfogel, 2002).

Although the studies above have alluded to the increased "stress" that poverty has on families, few of the studies have used a measure of financial stress to test this hypothesis. One exception is a study by Cadzow and colleagues (1999) examining the effects of individual-level covariates on physical abuse. They found that financial stress, above all other risk factors, including parental depression and domestic violence, was related to higher physical maltreatment during infancy. In sum, the effects of poverty on physical abuse reports and substantiation seems influenced by the unit of analysis (individual versus neighborhood/state level predictors) and the specific economic indicator used to measure poverty.

Child neglect. As with physical abuse, several studies have examined the relationship between child neglect and poverty using data from regional and national

population studies (Carter & Myers, 2007; Chaffin et al., 1996; Drake & Pandey, 1996; Jones & McCurdy, 1991; Paxson & Waldfogel, 2002; Sedlack et al., 2011; Shook, 1999; Slack et al., 2004; Slack et al., 2011). Although the results have been largely consistent—family poverty predicts a greater likelihood of child neglect—there is considerable variance in *which* economic indicators are more precisely related to neglect. Slack and colleagues (2004) found that perceived economic hardship was a robust predictor of future CPS neglect reports, but household income and welfare status were not; this was despite an earlier study where both income and welfare status were significant predictors of neglect (Slack et al., 2003). In a later study, they found that economic risk factors, such as using a food pantry, having the gas or electricity turned off, and receiving TANF or food stamps, were associated with an increased likelihood of childhood neglect (Slack et al., 2011).

From a slightly different angle, Carter & Myers (2007) examined the effects of several indicators of poverty on child neglect controlling for family risk factors such as, mental illness, substance abuse and domestic violence. After controlling for family risk factors, economic indicators, such as receipt of WIC, Medicaid, food stamps, and unemployment, *were not* directly associated with an elevated risk of neglect. The study by Carter and Meyers (2007) is contradictory to findings by Slack and colleagues (2011), where indictors of parental well-being did not attenuate the relationship between economic hardship and childhood neglect. A limitation in each of the studies presented above is that they look at the direct effects of social context on child neglect and do not

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consider that the effects of social context may be distal—meaning they are indirect, and affect the parent-child relationship through their impact on parental functioning and parenting.

2.4.2 Parental risk factors associated with physical abuse and neglect

Contextual factors affect child development indirectly through their influence on proximal factors (Millet et al., 2011). In particular, research has focused on parental functioning (e.g., depression) and parenting behaviors (e.g., harsh, coercive, disengaged and inconsistent parenting styles). Within the context of the child welfare system, some research suggests racial and ethnic variation in parental risk factors. For example, in a sample of parents involved in the child welfare system, Native American caregivers (27.0%) had the highest prevalence of mental health and substance abuse problems, compared to non-Hispanic white (23.7%), non-Hispanic black (23.6%), and Hispanic (10.9%) caregivers (Libby et al., 2006). In part, the higher prevalence of these risk factors among racial and ethnic minority parents is linked to their disproportionate exposure to confounding influences (in particular social context), such as low socioeconomic status, poor neighborhoods, and unemployment (Pecora et al., 2007).

Physical abuse. Parental mental illness has been associated with higher rates of physical abuse (Cazdow et al., 1999; Chaffin et al., 1996). However, not all parents who experience mental illness physically abuse their children. For this reason, most of the research has focused on the effects of parental depression on physical abuse through its influence on parenting behaviors. Much of the research regarding parental depression and

parenting has focused on the impact of maternal depression (see Lovejoy et al., 2000 for a meta-analysis on depression and parenting).

Maternal depression has been linked to harsh, and even hostile and coercive parenting (Du Rocher Schudlich et al., 2007). In a study of young infants, depressed mothers were more likely to be physically and verbally abusive with their children (Lyons-Ruth et al., 2002). Similarly, depressed mothers were found to be less consistent (Cummings et al., 2005) and more hostile in their discipline (Conger et al., 1994; Conger et al., 1995) with school-aged and adolescent children. In a meta-analysis, Lovejoy and colleagues (2000) found a moderate association between maternal depression and negative parenting behaviors—such that, depression was positively associated with harsh and coercive parenting styles. Factors such as child age, socioeconomic status and timing of maternal depression did not moderate the relationship between depression and negative parenting (Lovejoy et al., 2000). Similarly, Chaffin and colleagues (1996) found that maternal depression was the strongest predictor of physical abuse—depressed parents were 3.45 times more likely to initiate physical abuse. Depression, above all other psychiatric disorders, was a stronger predictor of physical abuse (Chaffin et al., 1996). In a study of new mothers, Cadzow and colleagues (1999) found that maternal depression was a strong predictor of physical abuse in a sample of infants up to seven months old (Cadzow et al., 1999). From a risk perspective, these findings are concerning since depression is the most common mental health disorder in the general population and has

been strongly linked to negative child outcomes in early childhood (National Research Council and Institute of Medicine, 2009).

Within the child welfare population, there is a large body of literature examining the prevalence of parental depression (Burns et al., 2009; Leschied, Chiodo, Whitehead, & Hurley, 2005; Mustillo et al., 2011) and the impact of depression and child mental health on placement stability (Helton, 2011; Leslie et al., 2005). Despite the high prevalence of depression found among caregivers, and the strong body of research linking depression to physical abuse, there is only one known study examining the indirect effects of physically abusive parenting styles on the relationship between parental depression and child mental health. In a study of children two to 15 years old involved in the child welfare system, Mustillo and colleagues (2011) found that parental depression was associated with neglectful, but not physically abusive, parenting. This finding was consistent across three age groups: preschool, school-aged and adolescents. The authors suggest that failure to detect a relationship between parental depression and physical abuse may be related to the inclusion of extreme parenting behavior, such as physical assault (2011). Although this study filled a substantial gap in the literature by examining the effects of parental depression on parenting behavior, other factors that have a strong association were not considered. One such example is parental drug and alcohol abuse.

Likewise, there is a strong relationship between substance abuse and physical abuse (Berger, 2005; Chaffin et al., 1996; Egami, Ford, Greenfield & Crum, 1996;

Famularo et al., 1992; Kelleher et al., 1994; Smith, Johnson, Pears, Fisher, & DeGarmo,

2007; Walsh et al., 2003). Substance abuse is a predictor of maltreatment in child welfare

samples, as well as in community samples. Research indicates that parents who abuse

drugs and alcohol may be more likely to use harsh or corporal forms of punishment

(Walsh et al., 2003). In a study of children in out-of-home care, Besinger and colleagues

(1999) estimated that one out of 13 children with a substance abusing parent experience

severe forms of child maltreatment—with alcohol abuse in particular a risk factor for

severe maltreatment (Widom & Hiller-Sturmhöfel, 2001).

      Using data from the National Institute of Mental Health (NIMH) Epidemiologic

Catchment Area (ECA) Surveys, findings from several studies (Chaffin et al., 1996;

Egami et al., 1996; Kelleher et al., 1994) have revealed a strong association between

parental substance abuse and child physical abuse. Kelleher and colleagues (1994)

revealed that parents with a lifetime drug or alcohol disorder were 2.7 times more likely

to have reported physically abusing their children; even after controlling for parental

depression and antisocial personality disorder. In a more recent study, Smith and

colleagues (2007) found that prenatal maternal drug and alcohol abuse was associated

with greater maltreatment and a greater number of foster care transitions. Additionally,

both prenatal and postnatal paternal alcohol and drug abuse was linked to higher

maltreatment (Smith et al., 2007).

      Perhaps one of the most compelling studies on the association between substance

abuse and physical abuse was conducted by Chaffin and colleagues (1996). Using data

collected in the first wave of the Epidemiologic Catchment Area Surveys study, they stratified parents into two groups: parents that reported maltreatment and parents that did not report maltreatment. Subsequently, they followed the non-maltreating parents for one year to examine which factors were associated with the onset of maltreatment. They found that social/contextual and demographic factors had little influence on the onset of physically abusive parenting. Rather, substance abuse—above other psychiatric disorders—was most strongly associated with physical abuse; almost tripling the likelihood of maltreatment compared with other established risk factors (Chaffin et al., 1996).

Research examining the effects of substance abuse on physical abuse with child welfare involved families has yielded similar findings to those in community samples. Walsh and colleagues (2003) found that rates of physical abuse were twice as high for children whose caregiver reported substance abuse problems. Likewise, parental substance use was associated with a higher prevalence of subsequent maltreatment reports (Wolock & Magura, 1996). Although there is a strong correlation between parental substance use and child maltreatment, the exact number of child welfare involved families with substance abuse problems is unknown (Barth, 2001). Yet, in 2001, 85% of child welfare administrators indicted that substance abuse was one of two critical issues faced by families reported for maltreatment (Peddle & Wang) and in 2004, the National Center for Substance Abuse reported a marked increase in the number of abused and neglected children affected by parental substance abuse problems. Despite the dire

need for research on substance abuse among families involved in the child welfare system, state agencies are not required to collect such data (U.S. Department of Health and Human Services, 2011). As a consequence, there are no reliable estimates of the number of families affected by substance use within the child welfare population.

       Child neglect. Research on the relationship between parental functioning and child neglect has been largely inconsistent. Maternal depression (Carter & Meyers, 2007; Cazdow et al., 1999) and parenting stress (Slack et al., 2011) have been linked to neglect in some studies but not in others (Cash & Wilke, 2003; Chaffin et al., 1996; Slack et al., 2004). This inconsistent pattern is more clearly observed in a study by Slack and colleagues (2011), where three different longitudinal data sets were used to predict parental self-reported neglect and CPS neglect reports. They found no consistent relationship between maternal depression or parenting stress and CPS neglect reports. However, maternal depression and parenting stress were associated with parental self-reports of neglectful parenting. This latter finding was consistent with a recent study by Mustillo and colleagues (2011) that found parental depression was associated with a higher likelihood of self-reported neglectful parenting among families involved in the child welfare system

       The effects of substance abuse on childhood neglect are similar to those discussed in the section on physical abuse. Within the context of childhood neglect, the effects of drug and alcohol are robust (Carter & Meyers, 2007; Cash & Wilke, 2003; Cazdow et al., 1999; Chaffin et al., 1996; Kelleher et al., 1994). In a national survey of parents in a

community-based drug treatment program, Cash and Wilke (2003) found that cocaine and heroin abuse increased self reported likelihood of neglect, whereas alcohol abuse did not. Moreover, the severity of use was positively associated with neglect—such that parents who were more impaired reported a higher number of incidences of neglect (Cash & Wilke, 2003). Although the findings are dated, Kelleher and colleagues (1994) found that children who live with parents who abuse drugs and alcohol were 4.2 times more likely to experience neglect; these effects remained consistent even after controlling for family socioeconomic status, as well as depression and antisocial personality disorder. In contrast to the studies above, Slack and colleagues (2011) found that neither drug nor alcohol abuse predicted parental neglect nor CPS neglect reports across three nationally representative population studies. However, the use of several single item questions, rather than a psychometric scale, likely underestimated the presence and severity of a problem behavior.

Despite the incredible needs of substance abusing families, and the strong association between drug and alcohol abuse and child maltreatment, there are several methodological limitations to the research in this area. A major limitation in this area of research is the failure to distinguish between drug and alcohol abuse and maltreatment type. Research has largely been inconsistent in defining drug and alcohol abuse, generally collapsing questions into a single variable (Kelleher et al., 1994). Failure to differentiate the type of substance abuse has been especially prevalent in child welfare data (U.S. Department of Health and Human Services, 2011) and is particularly problematic for this

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population—especially given that research has shown drug and alcohol abuse affect the type of maltreatment in different ways (Famularo et al., 1992). Similarly, few researchers have examined the effects of alcohol and drug abuse by maltreatment type (Jones & McCurdy, 1992; Walsh, et al., 2003). Studies by Kelleher and colleagues (1994) and Famularo and colleagues (1992) are exceptions, but their findings are dated. Given the context of the current economic crisis, issues of substance abuse in relation to child maltreatment and child mental health should be revisited. This is especially true since, despite the impact of substance abuse on parenting behaviors, "the mechanisms for this association remain unclear" (Wash et al., 2003, p. 1409).

2.4.3 Child risk factors associated with physical abuse and neglect

Experts in developmental psychology and child development have focused on how child characteristics, such as age, gender, temperament and poor health, interact with social and family contexts to contribute to maltreatment. However, few studies examining the effects of child characteristics on physical abuse and neglect have been able to decipher the individual contribution of child, parental and contextual risk factors. In this section, child risk factors are explored within the context of physical abuse and neglect.

Physical abuse. While demographic characteristics of children, such as child age, gender and race have been associated with physical abuse (Berger, 2005; Jones & McCurdy, 1992), child temperament has received the most attention. Difficult temperament, especially during infancy, may undermine parenting in maltreated and non-

maltreated samples (Belsky, 1983; 1984; Casanueva et al., 2010; Cicchetti & Barnett, 1991). In a recent study, Berger (2005) found that child aggressive tendencies were associated with an increased risk of physical abuse. Similarly, Sullivan & Knutson (2000) found that children with a disability were 3.7 times more likely to experience physical abuse than were non-maltreated children—and families with disabled preschool and elementary school children reported a significantly higher number of stress factors. Albeit limited, there is some evidence suggesting that low-birth weight during infancy may increase a child's risk of maltreatment (Slack et al., 2011; Wu et al., 2004).

Within the context of the child welfare system, children with behavioral and medical disabilities were more likely to exhibit placement disruptions (Barth, Lloyd, Green, James, Leslie & Landsverk, 2007; Helton, 2011; Rolock, Koh, Cross & Manning, 2009). To some extent, child characteristics—particularly when it comes to chronic conditions—appear to have some influence on maltreatment. This is marked by the high percentage (16%) of children involved in the child welfare system with a disability. Yet, despite the proposed influence of child characteristics on parental functioning, the direction of this causal relationship is unclear (Walsh et al., 2003). The contribution of biogenetics and gene-environment interactions further complicates issues of directionality.

Child neglect. It is widely recognized that child characteristics influence maternal responsiveness during the early years of life (Belsky, 1984). Mothers that perceive their child's temperament as difficult may be slower in responding to the needs of the child.

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Yet despite theoretical literature describing the bidirectional influence of child

temperament and parenting, there are few studies that have examined how such processes

interact (Belsky, 1984). Within the child welfare literature, researchers have examined

how age, gender and disability status elevate the risk of neglect (American Humane,

2003; Carter & Meyer, 2007; Sedlack et al, 2011; Slack et al., 2004; Sullivan & Knutson,

2000). Sullivan & Knutson (2000) found that children with a disability were 3.7 times

more likely to experience neglect than were children without a disability. Among

children in the child welfare system, those with a confirmed behavioral disability were

more likely to be in out-of-home placements (Bath et al., 2007), as well as experience a

greater number of placement disruptions (Helton, 2011). Although there is some

consistency in the literature around which characteristics are linked to child neglect, as in

the case of physical abuse, few studies have been able to decipher the causal direction of

child characteristics on neglect.

2.5 Consequences of parental depression and substance abuse for child mental health outcomes for children involved in the child welfare system

Maltreatment can have a noticeable impact on the brain structure, affecting

children's ability to regulate and manage stress (Hagele, 2005; King et al., 2001).

Children who have experienced maltreatment often have complex difficulties (Sullivan &

van Zyl, 2008), including poor emotional recognition (Pollak, Cicchetti, Hornung, &

Reed, 2000), fewer adaptive emotional regulation skills (Shipman, Schneider, Sims,

Swisher & Edwards, 2007; Sullivan & van Zyl, 2008), negative or insecure attachments

(Cicchetti & Barnett, 1991; Stirling & Amaya-Jackson, 2008), and compromised social

competence (Stahmer et al., 2005). As a consequence of maltreatment, children may be at an elevated risk of developmental problems in the areas of cognition, language/communication, social skills and adaptive behavior (Casanueva et al., 2008; Stahmer et al., 2005).

When children do not experience responsive relationships, or when they are met with harsh criticism and/or physical abuse, their social and emotional development can be adversely affected (Barth et al., 2008). This is reflected in the higher prevalence of mental health disorders in children involved in the child welfare system compared with those in the general population. Estimates on the number of children affected by mental health problems (including social, emotional and behavioral problems) have ranged from 27% to 80% (Burns et al., 2004; Framer et al., 2001; Kortenkamp & Ehrl, 2002; Stahmer et al., 2005); this is compared to 20% among children in the general population (U.S. Department of Health and Human Services, 1999). Some researchers have criticized these estimates, indicating that maltreating parents are probably more likely to criticize their children's behavior than are parents who have not been reported for maltreatment. Although there is some evidence to support this hypothesis—especially in the case of externalizing behaviors (Lau, Veleri, McCarty & Weisz, 2006)-research is consistent about the adverse short- and long-term consequences of maltreatment on child mental health. When left untreated, social and behavioral problems in early childhood often lead to difficulty in school and increase their risk for substance abuse, juvenile delinquency and exposure to violence (Simpson, Cohen, Pastor, & Reuben, 2006).

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Until recently, the majority of research on the mental health needs of children has focused on children in out-of-home care. However, recent findings suggest that maltreatment substantiation is a poor predictor of developmental outcomes among children involved in the child welfare system (Casanueva et al., 2008)—such that these children have compromised developmental outcomes regardless of substantiation. For this reason, there is a growing body of research examining outcomes among children who remain at home with their caregivers after a CPS investigation. In a sample of children two to 14 years old, Burns and colleagues (2004) found that 47.9% of children demonstrated a mental health problem. Clinical levels of problem behavior (internalizing and externalizing) were highest for adolescents (65.7%) and lowest for preschoolers (32.3%). Parental risk factors, such as maternal depression, substance use and impaired parenting, heightened mental health problems in children (Burns et al., 2004; Burns et al., 2009; Leschied et al., 2005).

Using data from the first NSCAW study, Burns and colleagues (2004) found that among parents with parental depression, 40% of their children and adolescents scored in the clinical range for internalizing difficulties and 60% scored in the clinical range for externalizing problems. In a longitudinal study of children involved in the child welfare system, Mustillo and colleagues (2011) found that parental depression had an initial and latent effect on child mental health scores. For pre-school aged children with a depressed caregiver, they averaged four points higher on the CBCL than did children living with a non-depressed caregiver. The effects on parental depression on the mental health of older

children were smaller, with a two point increase for school-aged children and a three point increase for adolescent children. Additionally, the effects of parental depression on child mental health were partially mediated by neglectful parenting. Parents who experienced depression were more likely to report neglect—which partially explained the negative impact on child mental health (Mustillo et al., 2011).

Studies have shown that parental substance abuse is a clear risk factor for child maltreatment (Donohue, Romero & Hill, 2006; Wulczyn, 2009), as well as poor child mental health (Dore et al., 1995). Yet, in the absence of child maltreatment, the direct effect of substance abuse on child mental health is strong, suggesting "indirect, as well as direct effects on the psychosocial development of children" (Dore et al., 1995, p. 531). Several areas of impairment were detected in children from substance abusing families: (a) increased prevalence of Attention Deficit Disorder, with and without hyperactivity, (b) a higher prevalence of addictive behaviors in adolescence, (c) impaired intellectual academic functioning, (d) clinical levels of mood and anxiety disorders, and (e) lower self-esteem (Dore et al., 1995, p. 534).

The effects of parental substance abuse on children in utero are catastrophic, resulting in a host of physical, behavioral and developmental consequences. Infants who are exposed to drugs and alcohol in utero may exhibit irritability, poor feeding, increased respiratory problems and poor emotional regulation, as well as delays in language and motor development (Dore et al., 1995). Research has shown a strong correlation between maternal substance use and poor child development. Substance abuse during pregnancy,

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which often leads to Fetal Alcohol Syndrome and drug addiction at birth, is associated with subsequent maltreatment reports (Smith & Testa, 2002). In 1999, the Substance Abuse and Child Protection Report by the Department of Health and Human Services indicated that Fetal Alcohol syndrome was the leading known cause of mental retardation in children.

Children whose parents have co-occurring disorders are at elevated risk of maltreatment. Indeed, the number of parents with co-occurring disorders is high among children involved in the child welfare system. Burns and colleagues (2010) found that among parental caregivers who reported depression, 14.5% also reported substance dependence. Children of parents who received treatment for depressive and substance abuse disorders were less likely to be removed from their home and to receive a subsequent maltreatment report compared with children whose caregiver remained untreated (Burns, et al., 2010). Despite the significant number of children with parents with co-occurring disorders, few studies have examined their impact on child maltreatment, as well as on the mental health outcomes of their children. Moreover, despite the impact of substance abuse and mental illness on parenting behaviors, child maltreatment and child mental health, "the mechanisms for understanding these associations remain unclear" (Wash et al., 2003, p. 1409).

2.6 A conceptual model to help fill gaps in the child maltreatment literature

The literature review shows that research on contextual, parental and child risk factors has advanced our understanding of child maltreatment. Overall, research is

consistent: economic hardship is positively associated with child welfare involvement and children involved in the child welfare system are more frequently exposed to risk factors, such as parental depression, substance use, and impaired parenting. As many as 80% of parents with child welfare involvement have mental health and/or substance abuse problems (Libby et al., 2006; Libby et al., 2007). However, few studies have jointly examined these risk factors together (parental depression, substance abuse, and impaired parenting).

There are many unanswered questions in the area of substance abuse and child maltreatment. The majority of studies integrating substance use has relied on single-item questions, have not differentiated between drugs and alcohol abuse, and have not examined how type of substance abuse is associated with maltreatment type (Kelleher et al., 1994; Walsh et al., 2003). Failure to use standardized assessment tools likely does not capture the severity of problem behavior. This is especially problematic within the context of the child welfare system, where children who are the subject of a maltreatment report because of parental substance abuse are more likely to be removed from their home, placed in foster care, and adopted rather than reunified with their biological family (Wulczyn, 2009). These lingering questions are important to the study of child maltreatment—because co-occurring risk factors are likely to predict poor child developmental outcomes, as well as subsequent maltreatment reports.

The literature on child development helps us conceptualize the relationship between these variables. A substantial body of research in the area of child development

documents the relationship between economic hardship (mainly family income) and negative child outcomes (Brooks-Gunn & Duncan, 1997; Duncan & Brook-Gunn, 1997; Duncan et al., 1998; Gershoff et al., 2007; Mistry et al., 2002; Mistry et al., 2004; Yeung et al., 2002). In particular, low income has been associated with poorer cognitive development in young children, especially during the preschool and early school years (Duncan et al., 1994; Duncan et al., 1998; Yeung et al., 2002).

Despite a strong correlation between economic indicators and developmental outcomes in children, contemporary researchers are moving beyond descriptive studies to examine *how* (or the processes in which) economic hardship affects child development (Mistry et al., 2002; Yeung et al., 2002). One way of explaining this relationship is through examining the indirect (or mediating) effects of family processes (Conger & Donnellan, 2007; Cummings et al., 2005; Gershoff et al., 2007; Mistry et al., 2002; Mistry et al., 2004; Yeung et al., 2002). Family processes are defined as aspects of family life and are characterized by parental functioning (e.g., parental depression) and parenting behavior (Conger et al., 2002). The indirect effects of family processes have been examined with multiple aspects of child development, including mental health (Conger et al., 1992), academic achievement and delinquency (Benner & Kim, 2010), and cognitive-linguistic development (Mistry et al., 2002; Mistry et al., 2004; Gershoff et al., 2007; Yeung et al., 2002).

In the family stress model, the relationship between economic hardship and child mental health are proposed to be weak and better explained by other proximal factors

(e.g., family processes). The stress associated with not being able to make ends meet,

increases parental emotional distress. Greater emotional distress negatively affects

parent-child relations by increasing harsh, inconsistent and disengaged parenting

practices (Belsky, 1984; Du Rocher Schudlich & Cummings, 2007; Mustillo et al., 2011).

Ultimately, it is the negative parent-child interactions that have an adverse effect on child

development (Conger et al., 1992; Conger et al., 1994). Figure 2.2 shows the conceptual

model.

Figure 2.2: The Family Stress Model
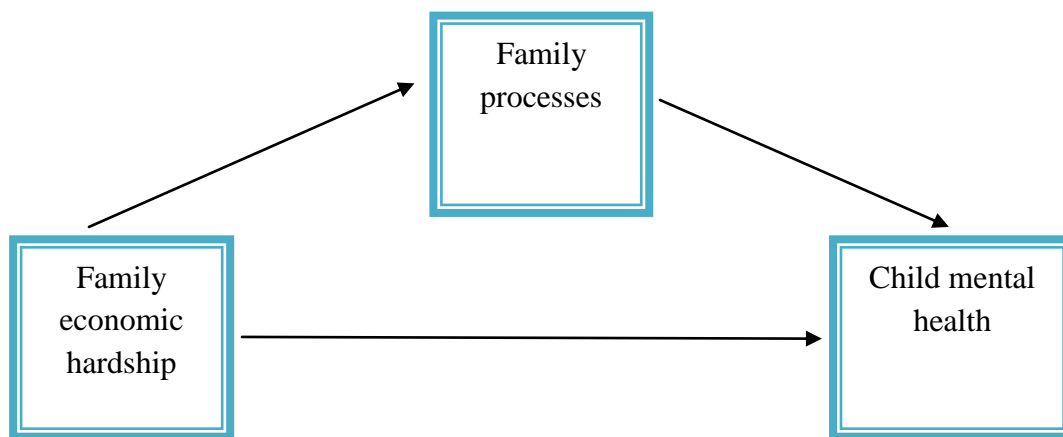
The family stress model has been tested in samples of adolescents (Conger et al., 1992;

Conger et al., 1994; Conger et al., 1995), as well as in samples of young children (Mistry

et al., 2002; Mistry et al., 2004; Yeung et al., 2002) and ethnically diverse samples

including, Chinese (Benner & Kim, 2010), Latino (Dennis, Parke, Coltrane, Blacher, &

Borthwich-Duffy, 2003; Formoso, Gonzales, Barrera & Dumka, 2007) and African

American (McLoyd, 1990; Mistry et al., 2002). Likewise, this model has been examined among low income families. McLoyd (1990) described the influence of economic hardship on low income and minority families within an ecological framework. Chronic stressors associated with poverty, like single parenthood and neighborhood violence, decrease parental psychological well-being. These stressors, in turn, diminish "the capacity for supportive, consistent and involved parenting" (McLoyd, 1990, p. 311).

Like in the child welfare literature, developmental researchers have struggled to identify precisely which aspects of economic hardship effect child development. Yeung and colleagues (2002) found that the bivariate relationship between income and child behavioral outcomes was significant. However, when family stress mediators were added to the model, the relationship between income and child behavioral problems disappeared; such that family processes explained more of the variance in child behavioral problems than did income (2002). Similarly, Mistry and colleagues (2004) examined the effects of family economic well-being on child mental health outcomes. In this study, economic well-being was determined with a measure of income-to-needs ratio determined by family income, household size, and the poverty threshold in 2002. They found that family economic well-being was strongly related to family processes and moderately related to child behavioral problems. A critical finding from this study was that the income-to-needs ratio did not have a linear relationship with family processes and child outcomes; that is the relationship between income, family processes and child outcomes was strongest for families at, or below, the poverty line.

Research on the family stress model has been largely consistent showing family processes as strong mediators between economic hardship and child mental health. However, these relationships have not been tested as part of a conceptual framework for children involved in the child welfare system. Given that many of these risk factors, including, poverty, depression, substance abuse and impaired parenting are related to why many families come to the attention of the child welfare system, testing these relationships can help increase our knowledge about maltreatment and child mental health.

2.6 Applying the family stress model to a child welfare population

Given the context of this chapter, children who are the subject of maltreatment reports experience significant risk. The family stress model, as described in the previous section, is an example of a risk model. While this model has been tested with diverse populations, it has not been examined with children involved in the child welfare system. Additionally, parental functioning is often evaluated via parental depression. Few studies have examined the effects of alcohol and drug use within the context of the family stress model. Risk models are helpful in identifying children and families that are most at risk (Wu et al., 2004).

In the child welfare literature, there are few studies that disentangle the relationship between economic hardship, parental functioning, child maltreatment, and child mental health. However, two studies using child welfare data provide significant insight about these patterns of association with children in the child welfare system—

although again not via the family stress model. The first study, conducted by Slack and colleagues (2004) examined the direct and mediating effects of poverty on the likelihood of childhood neglect reports. Findings from this study revealed that parenting behaviors partially mediated the relationship between poverty and childhood neglect. Interestingly, of the measures of poverty, only perceived economic hardship by the parent was related to neglect. Among the various parenting indicators, spanking and low parental warmth was associated with neglect reports. While this study contributes to our knowledge about parenting as a mediator between poverty and child neglect, there is no exploration as to how these relationships affect child development—and in particular, mental health.

In a different study, Mustillo and colleagues (2011) examined physical abuse and neglect as mediators between parental depression and child mental health outcomes. Parental depression had a direct effect on child mental health in preschool, school-aged and adolescent children. Additionally, neglectful parenting explained some, but not, all of the relationship between parental depression and child mental health. Interesting, parental depression did not predict physically abusive parenting (Mustillo et al., 2011). While this study provided significant insight about the mediating role of neglectful parenting on the relationship between parental depression and child mental health for children in the child welfare system, several questions still remain.

This study will extend the existing knowledge in three ways. First, while the research shows that poverty, parental depression and physical abusive and neglectful parenting predict child maltreatment and child welfare involvement, this study will

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examine how these risk factors affect child mental health. Second, this study will make a significant contribution to research in the area of substance abuse and child maltreatment by examining the effects of drug and alcohol abuse separately on physical abuse and neglect. Finally, the inclusion of psychometric assessment tools, and the use of structural equation modeling, will improve our confidence in the findings with respect to measurement error, reliability and discriminant and convergent validity.

CHAPTER 3: METHODOLOGY

This study was designed to examine the mediating role of family processes in understanding the relationship between economic hardship and child mental health outcomes. The study was based on a cross-section of data from a national survey of children and families brought to the attention of the child welfare agencies because of suspicion of child maltreatment.

3.1 Data

Data for the current study were drawn from the National Survey of Adolescent and Child Well-Being-II (NSCAW-II). NSCAW-II is the second national longitudinal study of children and families involved in the child welfare system. Children and families in the NSCAW-II study were sampled from child abuse and neglect investigations that were closed during February, 2008 through April, 2009. Baseline (wave I) data for NSCAW-II were completed in September 2009; wave 2 of NSCAW-II was completed in January, 2011 (Dolan, Smith, Casanueva, & Ringeisen, 2011). The survey and research methodology employed in NSCAW-II is largely based on NSCAW I. The NSCAW studies are the only nationally representative data collected from multiple sources (children, caregivers, caseworkers and teachers). When the proper sampling weights are employed, these data produce national estimates of child well-being, safety and permanency outcomes of children involved with the child welfare system (Research Triangle Institute, 2010).

NSCAW was initiated through the Personal Responsibility and Work Opportunities Act of 1996 (PL 104-193) and was funded by the Administration to Children and Families (ACF) of the Department of Health and Human Services and conducted by the Research Triangle Institute (RTI), ICF Caliber Associates, Walter R. McDonald and Associates, the Tuffs-New England Medical Center, The Child and Adolescent Services Research Group, and The Children and Families Research Center at the University of Illinois at Urbana-Champaign (National Data Archive on Child Abuse and Neglect, 2010).

Since completion of the NSCSW-I study federal legislation has been put in place to impose greater accountability on child welfare agencies. However, despite these new demands, financial cuts in state budgets and eligibility changes in welfare and other programs, have changed the context of providing child welfare services (Research Triangle Institute, 2010). The purpose of the new cohort of children in NSCAW-II was to identify how children and families are faring in the current financial context. More specifically, how is the current financial crisis associated with child maltreatment and foster care outcomes? And are the developmental and service needs of these children being met (Research Triangle Institute, 2010)?

The target population of the NSCSW-II study consists of 5,873 children, birth to 17.5 years of age, who have come to the attention of the child welfare system due to suspicion of maltreatment. The children and families were eligible to participate in the study regardless of whether the maltreatment allegation was substantiated (Dolan et al.,

2011). This distinction is important as it highlights the fact that the sample consists of both children who have experienced maltreatment and those who may not have experienced maltreatment. Indeed, the issue of substantiation is complex and at times counter-intuitive. Substantiation of abuse is often a legal process and requires proof of maltreatment (Zellman, 1992). As a consequence, the lack of substantiation status does not necessarily mean the child was not maltreated. Indeed, this is a limitation of the public child welfare system.

Key respondents included caregivers, children (if they were 11 years of age and older), caseworkers, teachers and agency directors. Only the child who was the subject of the maltreatment investigation was eligible to participate in the study (National Data Archive on Child Abuse and Neglect, 2010). To select participants, a two-stage stratified sample design was employed. In the first stage, the United States was divided into nine sampling strata, with eight of the sampling strata corresponding to the states with the largest child welfare populations and the final strata corresponding to the remaining 38 states and the District of Columbia. Eight states were excluded from the study because state law required first contact be made by CPS agency staff rather than by NSCSW staff. Primary sampling units (PSUs), which were generally defined by counties or child welfare agencies, were randomly selected from each of the nine strata (National Data Archive on Child Abuse and Neglect, 2010). Counties that participated in NSCAW-I were recruited to participate in NSCAW-II. Fifteen of the original counties refused to participate in NSCAW-II and these counties were replaced with a county of similar size

and caseload demands. In NSCAW-I, a probability-proportionate-to-size procedure was implemented in order to ensure that PSUs with higher caseloads were selected. Unequal probability of selection was counterbalanced by selecting the same number of children within each PSU, regardless of the size. However, in NSCSW-II this strategy was not possible because the PSU sizes had changed since the completion of NSCAW-I. Thus, to minimize unequal weighting effects, the PSU sample allocations were allowed to vary across PSUs and constraints were imposed to establish minimum and maximum sample sizes within PSUs (National Data Archive on Child Abuse and Neglect, 2010).

In the second stage of the sampling design, children from child protection agencies were selected from for PSUs sampling frame according to five domains: infants less than 1 years old who were not receiving CPS funded services; infants less than one years old receiving CPS funded services and were in out-of-home placements; infants less than 1 years old receiving CPS funded services and were not in out-of-home placements; children 1-17.5 years old who were receiving services but not in out-of-home care; and children 1-17.5 years old who were receiving services and were in out-of-home placement. In order to have sufficient cases to analyze, some sub-populations were oversampled, including infants, children receiving services and children in out-of-home placement (National Data Archive on Child Abuse and Neglect, 2010).

Data collection was largely the responsibility of the Research Triangle Institute and prior to data collection, Institutional Review Board (IRB) for the NSCAW-II study was obtained from several institutions and a federal Certificate of Confidentiality was

approved by the National Institute of Mental Health for NSCAW data. Caregivers who agreed to participate in the study were asked to sign an informed consent and assents were obtained for the participating child. The survey instrument was created through collaboration with experts from the Instrumentation Design Team and psychometric, or standardized, instruments were selected by content experts on this team. For example, for cognitive competencies, experts in child development evaluated several measures in terms of their psychometric properties (e.g., reliability, validity, etc.) before deciding on the inclusion of three different age-specific assessment tools (National Data Archive on Child Abuse and Neglect, 2010).

Caregivers, both current and former, were asked about personal and household related issues and current caregivers were asked about child functioning, service need and use, parental emotional well-being, substance abuse and parenting skills. Sensitive questions related to mental health, substance abuse, sexual activity, delinquency and unlawful behaviors were administered via the Audio Computer-Assisted Self Interview (ACASI) system. It is important to note that the survey instrument for children varied by age; for example, children 11 years of age and older were given a longer interview module and sensitive questions were also completed via the ACASI system. The teacher interview was sent for eligible children, kindergarten to 12th grade. Teachers were probed about the child's academic performance, as well as about their social skills. The response rates for all of the modules were high. The majority of cases have complete data records

from all sources (64.7%) and the over-all weighted response rate across all key respondents was 55.8% (National Data Archive on Child Abuse and Neglect, 2010).

Because of the sensitive nature of NSCAW-II data, there are two versions: a general release dataset and a restricted dataset. This study is based on the restricted dataset. In order to obtain access to the restricted data, a thorough data protection plan was approved by National Archive on Child Abuse and Neglect, located at Cornell University. Data were located on an off-line computer, without internet access. Prior to obtaining the restricted data, the study was approved by The University of Texas at Austin Institutional Review Board.

3.2 Study sample

The current study used a cross-section of data from the first wave of NSCAW-II. In Wave I of the study, 5,873 children and their caregivers participated in survey. Although the structure of the data imply it is nationally representative, this sample is not representative of the general population of children from the sample age group or of children who may suffer from child abuse or neglect. Rather, they are only representative of children who are involved in the child welfare system; or those who are reported due to **suspicion** of maltreatment.

The sampling frame for the current study was based on two inclusion criteria. First, only children living with a permanent caregiver (n=3,636) were included in the study. A permanent caregiver is defined as a biological parent, adopted parent or other permanent caregiver. More than 85% of children were living with a biological mother or

father. However a small proportion (3.8%) of children was reported as living with an adopted or other permanent caregiver.[1] It is important to note that adopted and/or other permanent caregivers are also in the sample as a result of new allegations of child maltreatment. In this way, they do not differ from biological parents. Given that adopted parents and other relatives represent a very small proportion of the sample of permanent caregivers, and they are involved in the child welfare system because of new allegations of abuse and/or neglect, the current study did not differentiate adopted/ permanent caregivers from biological parents. In this study, permanent caregivers and parents are used synonymously. Children living in an out-of-home setting with non-permanent caregivers were excluded from the current study because several of the measures related to parental functioning (e.g., alcohol dependence, drug use and physically abusive and neglectful parenting) were not asked to kin, foster or group home caregivers.

Child age was the second criterion for inclusion into the study sample. Only children 18 months to 11 years old were included in sample. The sampling frame was limited to young children for three reasons: (1) studies indicate that young children, especially infants and toddlers, are most vulnerable to maltreatment (U.S. Department of Health and Human Services, 2011); (2) the consequences of physical abuse and neglect during early childhood are most severe to the formation of developmental competencies

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[1] The numbers presented in the text do not equal 100%. This is because the relationship of the caregiver to the child was missing on 10.38% of the sample. This question was unintentionally skipped and therefore the status of the caregiver to the child is unknown. This information was not imputed, as relationship to caregiver was not included as a variable in the model. Rather, it was part of the criteria for inclusion into the sample. These cases were not excluded for the sample because they were asked key questions related to parental depression, substance use and parenting. While the relationship to the caregiver is unknown, the children are not part of foster care, group home or kinship care—as these parents were not asked the questions mentioned above.

during this period (Hagele, 2005); (3) previous research suggest that the effects of poverty are most severe for early preschool and elementary school aged children (Yeung, et al., 2002). The final sample included 1,667 children in the sample.

<div align="center">

3.3 Measures

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This section describes the assessment tools and questionnaire items that were used to test the research questions. Table 3.6 provides a summary of each of the scales and items included in the current study.

3.3.1 Primary dependent variable

Child mental health. The primary dependent variable in the current study is child mental health. In this study, I measure child mental health using the Child Behavior Checklist Total Problem Scale (CBCL). The CBCL was administered to primary caregivers. The assessment tool standardizes descriptions of problem behaviors and competencies that are age appropriate but is not intended to provide diagnostic inferences (Achenbach, 1991). For example, questions asked to caregivers of children 18 months to five years old include, "Would you say your child wants a lot of attention?" "Would you say your child wanders away from home?" "Would you say your child is withdrawn or doesn't get involved with others?" For children six to 11 years old, examples of questions asked to caregivers include, "Would you say your child breaks rules at home, school, or elsewhere?" "Would you say your child repeats certain acts over and over?" "Would you say your child sees things that aren't there?" Items are based on a 3-point Likert-scale, with 0 = not true, 1 = somewhat or sometimes true, and 2 = very, or often, true

(Achenbach, 1991). The original CBCL was developed for children two to three years of age. However, recently the assessment tool was restandardized for children 1.5 to five years old (Achenbach & Rescorla, 2000). The total problem scale, which was used in the analyses, was standardized by child age and gender.

The problem scale for 1.5 to five year olds comprises seven syndromes (e.g., anxious/depressed, somatic complaints, withdrawn, sleep problems, attention problems, aggressive behavior and other problems) and contains 100 items (National Data Archive on Child Abuse and Neglect, 2010). The problem scale for six to 18 year olds is composed of eight syndromes (e.g., anxious/depressed, somatic complaints, withdrawn, social problems, thought problems, attention problems, rule-breaking behavior and aggressive behavior) and contains 113 items (Achenbach, 1991). The raw scores for each of the items were converted to standardized t-scores and percentile scores by gender and age. These standardized scores were computed by the Research Triangle Institute and provided to restricted NSCAW users.

Scores for children 1.5 to five and six to 11 years were combined into a single measure for the current study and age was controlled for in the multivariate analyses. Although creating a single variable for the total problem scale of the CBCL was not optimal, it was not possible to run multiple group analysis by age group and apply the data weights. Failure to apply the weights in analyses leads to problems in the calculation of the standard errors. Since the standardized scores are on the same distribution, they were combined into a single measure and age was controlled in the analysis. Although

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this was not ideal, running multiple group models by child age was not a possibility given the structure of the NSCAW-II data.

CBCL scores in the sample range from 24-91. The national standardized mean for the CBCL is 50 with a standard deviation of 10. Higher scores suggest more problem behavior. A score of 64 and above on the CBCL demonstrate clinical problem behavior. It is important to note that 64 and above is a conservative estimate and does not include children who may be in the borderline clinical range. Weighted mean scores in the sample were slightly above the national average of 50 (M=52.09, SD= 12.08) but below the clinical cut-off score of 64. Less than a quarter of the children (21%) in the sample scored in the clinical range for problem behavior. The complete distribution of CBCL scores in discussed in further detain in Chapter 4.

Problems with missing data on the CBCL were minimal. Only six cases were missing, representing less than 1% of the study sample. Missing data on the CBCL were imputed using full information maximum likelihood, the default procedure in MPLUS software. This will be explained in greater detail later in the chapter in the section on missing data.

Previous studies have used CBCL to measure mental health with children involved in the child welfare system (Garland et al., 2000; Landsverk et al., 2002). However, the validity of the CBCL with low income racial and ethnic minority populations is frequently questioned. Indeed, previous research has found that low income minority children receive higher scores on the CBCL than do non-Hispanic white

children from middle and upper income families (Gross et al., 2006; Raadal, Milgrom, Cauce, & Mancl, 1994). However, it is difficult to ascertain whether higher scores among racial/ethnic minority children are reflective of an association between greater mental health problems and ethnic minority status or greater mental health problems and poverty (Gross et al., 2006).

Gross and colleagues (2006) examined these questions and found that for the externalizing scale, higher scores were a function of income not race and ethnicity or testing bias. Contrary to previous research, results from their study suggested that racial and ethnic minority children did not experience elevated externalizing problem scores. In contrast, higher scores on the externalizing scale were related to parental income. For the internalizing scale, differences in scores were a function of both race/ethnicity and income level. Higher scores were found in low income families, but also in children whose parents were Latino—regardless of income level (Gross et al., 2006).

The research presented above is important to the current study, as approximately 60% of the children in the sample live in poverty and more than half are children of color. To minimize measurement bias, this study included the total problem scale of the CBCL. The total problem scale includes items from the externalizing and internalizing subscales, along with items about other clinical syndromes. The total problem scale has been used in other studies examining mental health outcomes among children involved in the child welfare system (see Dettlaff & Berger Cardoso, 2010; Mustillo et al., 2011). Also, rather than dichotomizing the measure to represent the clinical cut-off level, the total problem

scale was included as a continuous measure. As such, research findings speak in general terms of child mental health problems, rather than clinical levels of impairment.

Finally, it is important to note that the CBCL is administered to the primary caregiver. Triangulating the parental assessment with a child self-assessment would have been ideal. However, psychometric assessment tools to measure behavior and mental health were not administered to children younger than 11 years old. In addition, the CBCL is administered to the primary caregiver, who may be the biological father, mother, adopted mother, adopted father or another relative. A recent study by Konold and colleagues (2004) found model invariance for the CBCL among mother, fathers and teachers by child gender. This suggests that there are no significant differences in CBCL scores by informant or child gender. On the other hand, the rater's assessment of child behavior is not objective (Konold, Walthall, & Piata, 2004; McConaughy & Ritter, 1995). This can be particularly problematic in the current study, especially in families where the parent is significantly impaired. If the parental assessment of child mental health is confounded with parental functioning, we would expect that child mental health scores would be higher (indicating worse mental health) among children whose parents were more impaired. However, in the current study, it was not possible to differentiate whether scores were higher for children due to parental dysfunction or whether the higher scores were a function of a bias assessment conducted by the impaired parent. Despite these limitations, the CBCL is one of the most widely used assessment tools examining child mental health and behavior.

3.3.2 Primary independent variables

Economic hardship. In the current study, economic hardship is operationalized using an income-to-needs ratio. Previous research suggests that a simple income measure may not capture the impact of being low income (Gershoff et al., 2007). The income-to-needs ratio was constructed using information on family income, household size, and estimates of the poverty threshold published by the United States Census Bureau. The threshold varies according to the number of people living in the household and is based on monetary estimates that project minimal standards for food and living expenses (Bishaw & Iceland, 2003). Several studies, using both community and child welfare samples, have used an income-to-needs ratio (Gershoff et al., 2007; Helton, 2011; Mistry et al., 2004).

This variable was constructed in several steps. First, missing data on income was assessed. When income was unknown, a series of questions were used to estimate family income within a $5,000 range. The median of that range was used to impute only in cases with a missing income variable. For example, the questionnaire reads, "Do you make under $35,000?" If the respondent indicates "yes," then they are asked, "Do you make less than $15,000?" If the respondent indicates "yes," then they are asked "Do you make less than $10,000?" If they indicate "no," the respondent makes between $10,000-$15,000 dollars. The median value, $12, 5000 replaced the missing income variable. This processed decreased the number of cases with missing income values from 281 (17%) to 150 (9%).

The second step was to create a variable that included the number of adults and children in the household. Household size was derived from two variables that asked about the number of parents and children in the household. These two variables were computed together to create the total family household size. The third step was to calculate a ratio by dividing family income by the corresponding poverty threshold. The poverty threshold for 2008 was used, as that was the year the first wave of the NSCAW-II was collected.[2] Families that fall below 1.00 live below the poverty line, while families above 1.00 live above the poverty line. For example, a family with a score of 5.1 lives five times above the federal poverty threshold; a family that has a score of .01 is at 1% of the poverty threshold. Finally, missing values for income (9%) were imputed in the analysis phase using full information maximum likelihood, which is explained in further detail in the section on missing data.

Parental functioning. Parental functioning is an important determinant in the relationship between economic hardship and poor child mental health. Previous research examining parental functioning as a mediator between economic hardship and child development has largely operationalized this construct using measures of parental depression (Conger et al., 1994; Conger et al., 1995; Mustillo et al., 2011). However, the current study included multiple measures of parental functioning. In particular, three psychometric instruments were used: (a) the Short-Form Health Survey, Mental Health

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[2] There were 16 cases of individuals with reported income levels at $0. An income level of $0 is ambiguous and the idea of relative poverty for those families is lost. To address this limitation, $1.00 was added to everyone's income that was not missing so that income levels were greater or equal to $1.00.

Component, (b) the Alcohol Use Disorders Identification Test (AUDIT), and (c) the Drug

Abuse Screening Test (DAST).

The current study operationalized <u>parental depression</u> using six items from the 12-

item Short Form Health Survey measure. The 12-item measure originated from a longer

36 item assessment tool known as the SF-36 Health Survey. There are two subscales in

both the SF-36 and the SF-12. There is a Physical Component Summary that asks

questions related to physical health and a Mental Component Summary that examines the

presence of emotional difficulties, such as depression. The 12-item Short Form Health

Survey has been used in several large population-based surveys (Gill, Butterworth,

Rodgers & Mackinnon, 2007). Six items from the Mental Health Component were used

in the current study, which as listed in Table 3.1. Although a more diagnostic measure of

depression using the Composite International Diagnostic Interview Short-Form (CIDI-

SF) was available in the NSCAW-II data set, this measure does not allow for the

examination of individual items. As such, performing an exploratory and confirmatory

factor analysis to test the underlining latent construct of depression was not possible.

Using an observed measure of depression introduces measurement bias; therefore the

Short Form Health Survey-Mental Health Component was selected over the former

measure because the underlining dimension of the measure could be tested with

exploratory and confirmatory factor analyses.

Table 3.1: Items from the Short Form Health Survey

Parental Depression
During the past 4 weeks have you accomplished less than you would like in your work or other daily activities as a result of emotional problems such as feeling depressed or anxious?
During the past 4 weeks, did you feel you didn't do work or other activities as carefully as usual as a result of any emotional problems such as feeling depressed or anxious?
During the past 4 weeks, how much of the time have you felt calm and peaceful?
During the past 4 weeks, how much time did you have a lot of energy?
During the past 4 weeks, how much of the time have you felt downhearted and blue?
During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities?

The first two questions in the scale are dichotomous (1=yes and 2=no). All other items are answered on a Likert scale, with 1=all the time, 2=most of the time, 3=a good bit of the time, 4=some of the time, 5=a lot of the time and 6=none of the time. Mental health items 3 and 4 ask about positive emotions and were therefore reverse coded in order to keep the direction of the scale consistent. The items are standardized and provided to NSCAW restricted users. A standardized score of 50 with a standard deviation of 10 is within the normal range, with higher scores representing better mental health (Ware, n.d.; Ware, Kosinski, & Keller, 1996).

Research on the psychometric properties of the 12-item Short Form Health Survey suggests that the test-retest reliability for the mental health questions fall within an acceptable range (0.76) and the validity was high, ranging from 0.93-0.98 (Ware et al.,

1998). NSCAW-II documentation reported internal reliability estimates for the mental health questions to be, $\alpha = 0.79$. Examination of internal consistency with the current sample provided similar results. The raw Cronbach alpha coefficient was $\alpha = 0.75$ and the standardized coefficient was $\alpha = 0.81$. Since there is limited research on the factor structure of the Short Form Health Survey-Mental Health Component, both exploratory and confirmatory factor analyses were conducted to examine the scale's psychometric properties with the sample population.

The second assessment tool included as a measure of parental functioning was the Alcohol Use Disorders Identification Test (AUDIT). The AUDIT, developed by the World Health Organization (WHO), is a brief assessment tool used to screen for <u>alcohol use and abuse</u>. It was designed to screen for risk drinking in primary care settings (Babor, Higgins-Biddle, Saunder, & Monteiro, 2001). The AUDIT consists of 10 questions that assess three domains of problem behavior: recent hazardous drinking, alcohol dependence and harmful alcohol use (Babor et al., 2001; Doyle, Donovan, & Kivlahan, 2007). Eight questions have response categories ranging from 0 = *never* to 4 = *4 or more times a week or daily*. The final two questions ask about injury resulting from alcohol use and others' perceptions of drinking behavior; these questions have response categories, 0 = *no*, 2 = *yes*, but not in the last year and 4= yes, in the last year[3]. Table 3.2 summarizes the 10 AUDIT items and identifies the domain that each question intended to measure.

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[3] Response categories in these last questions are not in consecutive order.

Table 3.2: Items on the Alcohol Use Disorders Identification Test (AUDIT)

Alcohol consumption
How often do you have a drink containing alcohol?
How many drinks do you have on a typical day when you are drinking?
How often do you have six or more drinks on one occasion?
Alcohol dependence
How often during the last year have you failed to do what was expected from you because of drinking?
How often during the last year have you failed to do what was normally expected from you because of drinking?
How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
Harmful alcohol use
How often during the last year have you had a feeling or guilt or remorse after drinking?
How often during the last year have you been unable to remember what happened the night before because you had been drinking?
Have you or someone else been injured as a result of your drinking?
Has a relative or friend or doctor or another health worker been concerned about your drinking or suggested you cut down?

The AUDIT has been tested in a variety of subpopulations, including clinical and non-clinical populations, as well as across diverse socioeconomic, racial and ethnic groups (Babor et al., 2001). However, the psychometric properties of the scale have not been tested with a child welfare population. In the current sample, the raw Cronbach alpha coefficient was α =0.83 and the standardized coefficient was α =0.87—which is similar to what has been reported in research with other samples (Babor et al., 2001).

While the authors of the scale indicate that the AUDIT is unidimensional, meaning that it is reliably measuring a single concept, other studies have shown that the AUDIT has more than one factor structure (Babor et al., 2001). Since previous research has found variation in the factor structure of AUDIT, and this is the first time that the AUDIT has been included in the NSCAW questionnaires, an exploratory and confirmatory factor analysis was conducted to examine the scale's dimensionality with the sample.

The Drug Abuse Screening Test (DAST-20) is a 20-items clinical screening tool that assesses drug abuse. This was the third psychometric tool used to capture parental functioning in the current study. The DAST-20 consists of 20 yes and no questions that are modified from the Michigan Alcoholism Screening Test. Scores for the DAST-20 range from zero to 20. There were 150 missing cases (9.0%), which were imputed using Full Information Maximum Likelihood in MPLUS software. Items from the DAST are in Table 3.3.

Table 3.3: Items from the Drug Abuse Screening Test-20

Drug Abuse Screening Test - 20 dichotomous questions
During the past 12 months, have you used drugs other than those required for medical reasons?
During the past 12 months, have you abused prescription drugs?
During the past 12 months, have you abused more than one drug at a time?
During the past 12 months, could you get through the week without using drugs?
During the past 12 months, have you always been able to stop using drugs when you wanted?
During the past 12 months, have you had blackouts or flashbacks due to drug use?
During the past 12 months, have you ever felt bad or guilty about your drug use?
During the past 12 months, has a spouse (or parents) complained about drug use?
During the past 12 months, has drug abuse created problems between you and spouse/parents?
During the past 12 months, have you lost friends because of drug use?
During the past 12 months, have you neglected family because of drug use?
During the past 12 months, have you been in trouble at work because of drug use?
During the past 12 months, have you lost a job because of drug use?
During the past 12 months, have you gotten into fights when under the influence of drugs?
During the past 12 months, have you engaged in illegal activities to obtain drugs?
During the past 12 months, have you been arrested for possession of illegal drugs?
During the past 12 months, have your experienced withdrawal symptoms when you stopped using drugs?
During the past 12 months, have you had medical problem as a result of your drug use?
During the past 12 months, have you gone to anyone for help for a drug problem?
During the past 12 months, have you been involved in a treatment program related to drug use?

The DAST has been used to assess substance abuse across diverse populations including psychiatric patients in inpatient and outpatient clinics, adolescents, offenders and minority men and women (Yudko, Lozhkina, & Fouts, 2007). Research testing the psychometric properties of the DAST-20 found that it was highly correlated with the longer version of the DAST. Furthermore, internal consistency has been high across a number of different samples, ranging from $\alpha= 0.74$-0.95 (Yodko et al., 2007) and test-retest reliability was 0.78 (Coco & Carey, 1998). Cronbach alpha scores were computed with the sample population and scores were similar to those cited in previous research (Yodko et al., 2007). Raw scores were $\alpha=0.87$ and standardized scores were $\alpha=0.90$.

In addition to test-retest reliability and internal consistency, there is a small body of literature describing the factor structure of the DAST-20. A review by Yodko and colleagues (2007) suggest substantial variation across samples. Several studies suggest that the DAST is a unidimensional scale, while others indicate that the DAST-20 is a two, five or even six factor scale (see Yodko and colleagues, 2007 for a complete review of the psychometric properties). Due to the highly skewed nature of the data, this variable did not meet the criteria for confirmatory factor analysis (i.e., minimum of five observations). As a consequence, drug use was included as a continuous, observed variable (ranging from zero to 20) rather than latent measure; with higher scores on the DAST representing more drug use.

Child maltreatment was constructed using the physical assault and neglect subscales of the Parent-Child Conflict Tactics Scales (CTS-PC). Throughout this

document, these subscales are referred to as measures of <u>physically abusive parenting and neglectful parenting</u>. Obtaining an accurate measure of child maltreatment is very difficult. Research and legal definitions of child maltreatment differ significantly. Substantiation of abuse is often used in legal settings to confirm the presence of child maltreatment (Rosenberg, Smith, & Levinson, 2007). However, the lack of substantiation of abuse does not mean that maltreatment did not occur. This discrepancy occurs because there are complex factors that impact the outcome of a child maltreatment case (Zellman, 1992).

Finding valid and reliable assessment tools to measure maltreatment is another challenge to obtaining accurate estimates of this phenomenon. Using scales of parenting behavior is subject to social desirability biases. It is often best to triangulate the responses from multiple sources, as failure to do so may lead to the underreporting of child maltreatment (Zellman, 1992). The CTS-PC was asked to caregivers and children over 11. However since the sample in the current study included children 11 years of age and younger, only the parental report of the CTS-PC was used. Using the caseworker's definition of maltreatment to triangulate parental reports was considered but ultimately abandoned because the type of abuse was missing from 12% of the cases in the sample. Failure to triangulate the responses in the current study may have contributed to lower-bound estimates of physically abusive and neglectful parenting found in the sample. This limitation should be considered when interpreting the results.

The CTS-PC scales consist of items that assess for child maltreatment. The scale draws from theoretical tenants of conflict theory, with an underlying assumption that parents will report abusive behavior as a mechanism of parenting. The purpose of the CTS-PC is to measure parenting behavior rather than severity of child injury (Straus, Hamby, Finkelhor, Moore & Runyan, 1998). The CTS-PC uses an 8-point Likert scale (1 time, 2 times, 3-5 times, 6-10 times, 11-20 times, more than 20 times, not in the past 12 months but it happened before, and never) to assess the frequency and severity of acts (Straus, 1990; Straus et al., 1998). The CTS-PC has several subscales, including non-violent discipline, physical assault, psychological aggression, sexual abuse and neglect. Only the physical assault and neglect subscales were included in the current study.

Dichotomous versions of the physical assault and neglect scales were included because the additive scales have been shown to demonstrate high validity but poor internal consistency; likely a consequence of underreporting and poor correlation between some of the items (Mustillo et al., 2011). To address this limitation, Straus and colleagues (1998) recommend dichotomizing the subscales so that parents who endorse one or more of the items are counted as engaging in the behavior. The variables were constructed by the Research Triangle Institute.

The physical assault subscale includes 13 items measuring minor assault (e.g., "have you ever spanked his/her bottom with your bare hand"), severe assault (e.g., "have you ever slapped him/her on the face") and very severe assault (e.g., "have you ever

grabbed her/him around the neck and choked him/her"). Table 3.4 provides the questions

included on the physical assault subscale.

Table 3.4 Physical assault subscale for the Parent Child Conflict Tactics Scale

Parent Child Conflict Tactics Scale-Physical assault subscale
In the past 12 months, how many times have you shaken child?
In the past 12 months, how many times have you hit child on bottom with a hard object?
In the past 12 months, how many times have you hit child with fist/kicked child hard?
In the past 12 months, how many times have you spanked child on the bottom with your bare hand?
In the past 12 months, how many times have you grabbed child around neck and choked?
In the past 12 months, how many times have you beat child/hit child hard over and over?
In the past 12 months, how many times have you burned or scalded child on purpose?
In the past 12 months, how many times have you hit child on another part of the body with a hard object?
In the past 12 months, how many times have you slapped child on hand, arm, and/or leg?
In the past 12 months, how many times have you pinched child?
In the past 12 months, how many times have you threatened child with a knife or gun?
In the past 12 months, how many times have you shaken child?
In the past 12 months, how many times have you slapped child on face/head/ears?

The neglect subscale in Table 3.5 was constructed using five questions and was intended to measure behavior that failed to meet the child's developmental needs (Straus et al., 1998). Neglect was constructed as 1=*neglectful parenting if the caregiver answered yes to any of the neglect questions in the last 12 months or ever* or 0=if caregiver reported *never* to all of the neglect items. The same logic was used to construct a dichotomous variable for physically abusive parenting; 1= *physically abusive parenting in the last 12 months or ever* and 0 = *never* to all items in the minor, severe and very severe physical assault subscales. Missing data on physically abusive parenting was n = 30 (2%) and for neglectful parenting was n = 33 (2%).

Table 3.5: The neglect subscale of the Parent-Child Conflict Tactics Scale

Parent-Child Conflict Tactics Scale-Neglect subscale
In the past 12 months, how many times have you ever had to leave your child at home, even when you thought an adult should be with him/her?
In the past 12 months, how many times were you so caught up with problems that you were not able to show or tell your child that you loved him/her?
In the past 12 months, how many times were you not able to make sure that your child got the food he/she needed?
In the past 12 months, how many times were you unable to make sure your child got to a doctor or hospital when he/she needed it?
In the past months, how many times were you so drunk or high that you had a problem taking care of your child?

Research on the psychometric properties of the CTS-PC is limited. As indicated, internal consistency for the subscales was low, ranging from 0.55 for physical assault to

0.70 for non-violent discipline. However, Cronbach's alpha for reliability in the study sample was high for both subscales, $\alpha = .91$ for neglect and $\alpha = .96$ for physical assault. Creators of the scale, Straus and colleagues (1998), suggest evidence of construct and discriminant validity. Holding age of child, parental socioeconomic status and gender of the child constant, there were no differences in corporal punishment between non-Hispanic white, non-Hispanic black and Hispanic caregivers and a slight elevation in multiple assaults among African American caregivers. Results for Hispanic caregivers were not tested. Similar results were found when examining the effects of parental age and gender and age of the child. These results suggest that the CTS-PC is valid measure for studying child maltreatment (Straus et al., 1998).

Admittedly, the authors acknowledge that issues of normative values and social desirability affect the measurement of child maltreatment. To address social desirability, authors used less inflammatory language, such as "spanked" rather than "hit" (Straus et al., 1998, p.260). It is important to note, however, that social desirability bias may also be correlated with social class. For instance, individuals from higher income households may be more likely to hide the abuse. If this were the case, higher levels of child maltreatment may be expected among minority racial/ethnic groups. While the authors acknowledge that their methods do not completely eliminate social desirability bias, the CTS-PC remains one of the only tested measurements to assess child maltreatment.

3.3.3 Controls/child variables

The etiology of child maltreatment is best understood within the context of social, family and child risk factors. Rather than adding child variables to the model, this study controlled for key characteristics associated with differences in child mental health outcomes. This approach was taken for two reasons: (a) this study used cross-sectional data and a significant limitation of this study design was the failure to establish the time-order of events; and (b) the focus of the family stress model was on the contribution of contextual and parental risks. As such, the best approach was to control for differences in key variables associated with child mental health and maltreatment: age, gender and presence of a diagnosed disability. In addition, parental race and ethnicity was also controlled for in the analysis—as there is typically a strong association to many of the social and parental risk factors posited in the model.

Child gender was included as a control variable, as previous research suggests that gender may be associated with differences in scores on the Child Behavior Checklist (Konold et al., 2004; Zahn-Waxler, Shirtcliff, & Marceau, 2008). Child gender was reported at Wave 1 by the caregiver. The variable is dichotomous, 1 = *male* and 2 = *female*.

The second control variable included in the model was child age. Child age at the time of the maltreatment report was constructed by NSCAW and measured in months. Child age was controlled for as there is often an association between child age and other

predictors in the model, such as family poverty and child maltreatment. Child age was constructed by NSCAW and measured in months.

The third control variable included in the study assessed access to <u>developmental services</u>. Developmental services included the presence of an Individualized Family Service Plan or an Individualized Education Plan. These two indicators are a proxy for child disability (Casanueva et al., 2008), and are expected to be associated with greater developmental needs in children. The variable was derived from two questions. For children under the age of three, the caregiver and caseworker were asked if the child received an Individualized Family Service Plan (IFSP). If either the caregiver or caseworker answered yes then 1= *yes received an IFS;* otherwise 0 = *no IFSP*. For children over three years old, the caregiver and caseworker were asked if the child received an Individualized Education Plan (IEP). If either the caregiver or caseworker answered 1 = *yes to IEP* and 0 = *no to IEP*. A single variable combining the IFSP and IEP measure was constructed. If either the caseworker or caregiver indicated the child had received an IEP or an IFSP, they were coded as 1 = *yes, developmental service received*. Otherwise, the observation was coded as 0 = *no, developmental services not received*.

The final control variable was <u>parental race and ethnicity</u>. Parental race and ethnicity was asked to the caregiver. The variable used in the current study was provided to NSCAW restricted users and is coded, 1= *white*, 2 = *non-Hispanic black,* 3=*Hispanic,*

4 = *other*. Four categorical/dummy variables were created for each race/ethnic group. In

the SEM analysis, non-Hispanic white caregivers were the reference group.

Table 3.6: A summary of measures used in the current study

Variable	Description of measure	Source in data set	Variable measurement	Reference
Main dependent variable:				
Child mental health (1.5-11 years)	The Child Behavioral Checklist (CBCL) standardizes descriptions of problem behaviors and competencies. For 1.5-5 year olds, the measure is composed of seven syndromes and for children 6-18 it is composed of eight syndromes. High scores indicated greater mental health problems.	Caregiver	Continuous variable	Achenbach, 1991
Primary independent variables:				
Economic hardship				
Income-to-needs	The income to needs is a ratio derived from three sources: family income, household size, and the United States Census Bureau poverty threshold in 2008—the year this wave of NSCAW-II was collected. This was a continuous ratio.	Caregiver	Ratio	Poverty threshold collected from 2008, United States Census Bureau
Family processes				
Parental depression	Six items from the Short Form Health Survey were used to measure mental health. A standardized score of 50 with a standard deviation of 10 is within the normal range, with higher scores representing better mental health. The variable was included as a latent variable.	Caregiver-ACASI system	Latent variable	Ware, Kosinski, & Keller, 1996
Parental alcohol use	The AUDIT measures alcohol problem behavior, abuse and dependence. The scale consists of 10 questions. The variable, alcohol use, was included as a latent variable.	Caregiver-ACASI system	Latent variable	Developed by the World Health Organization
Parental drug use	The DAST-20 measures drug use. The diagnostic scale consists of 20 yes and no questions.	Caregiver-ACASI system	Continuous variable	Skinner, 1982

Table 3.6 (continued)

Child neglect	A supplemental scale that measures neglect was added to the part of the Parent-Child Conflict Tactics Scale (CTS-PC). Parents who engaged in neglectful behaviors at least one time were categorized as 1=yes, neglect present, and parents who answered no to the items were categorized 0=no neglect.	Caregiver-ACASI system	Dichotomous variable	Straus, 1990; Straus et al.,1998;
Child physical abuse	The CTS-PC measures three subscales: non-violent discipline, psychological aggression and physical assault. The variable that will be used is derived from NSCAW. If the caregiver answered yes to ANY of the items of the three scales, they will be coded as 1=physically abusive parenting. If they did not answer yes to the items, they will be coded as 0= no physically abusive parenting	Caregiver-ACASI system	Dichotomous variable	Straus et al., 1998
Control Variables				
Child age	Constructed by NSCAW. It is a continuous variable in months.	Derived from caseworker and caregiver	Continuous variable in months	NSCAW-II (NDCAN 2010)
Child gender	Constructed by NSCAW. It is a dichotomous variable.	Derived from caseworker and caregiver	Dichotomous variable	NSCAW-II (NDCAN 2010)
Receipt of developmental services	Derived from two questions. For children under three, caregivers and caseworkers were asked if the child received an IFSP. For children over three years old, the caregiver and caseworker were asked if the child received an IEP. A single variable was constructed if either the caseworker or caregiver indicated the child had received an IEP or an IFSP. 1=yes received developmental services, 0=no developmental services.	Derived from caseworker and caregiver	Dichotomous variable	Casanueva et al., 2008
Parental race/ethnicity	Four dummy variables were derived: 1=white, 0=nonwhite; 1=non-Hispanic black, 0= not non-Hispanic black; 1= Hispanic, 0= not Hispanic; and 1=other, 0=not in the other group. In the SEM model, non-Hispanic white was the reference group.	Derived from caseworker and caregiver	Dichotomous variable, non-Hispanic white was the reference group	NSCAW-II (NDCAN, 2010)

3.4 Data analysis

The purpose of this study was to understand the role of economic hardship (i.e., income-to-needs) and family processes on the child mental health outcomes among children involved in the child welfare system. Descriptive and bivariate analyses were conducted to identify mental health outcomes by family income and family processes (measured by parental depression, alcohol use, drug use and physically abusive and neglectful parenting). Bivariate analyses included weighted t-tests and Pearson's R correlations. Multivariate analysis included structural equation modeling (SEM). SEM was used to examine the mediating effects of family processes on the relationship between family income and child mental health. The study had two major aims, which are described in detail below.

3.4.1 Aim 1: To provide a description of young children involved in the child welfare system.

Descriptive statistics were provided on all of the dependent and independent variables of interest in the current study. Figure 3.1 provides a list of these key variables.

Figure 3.1: Aim 1: Understanding contextual and parental risk factors on child mental

Child mental health

Family income

Parental depression

Parental alcohol use

Parental drug use

Physically abusive parenting

Neglectful parenting

Child Mental Health Outcomes
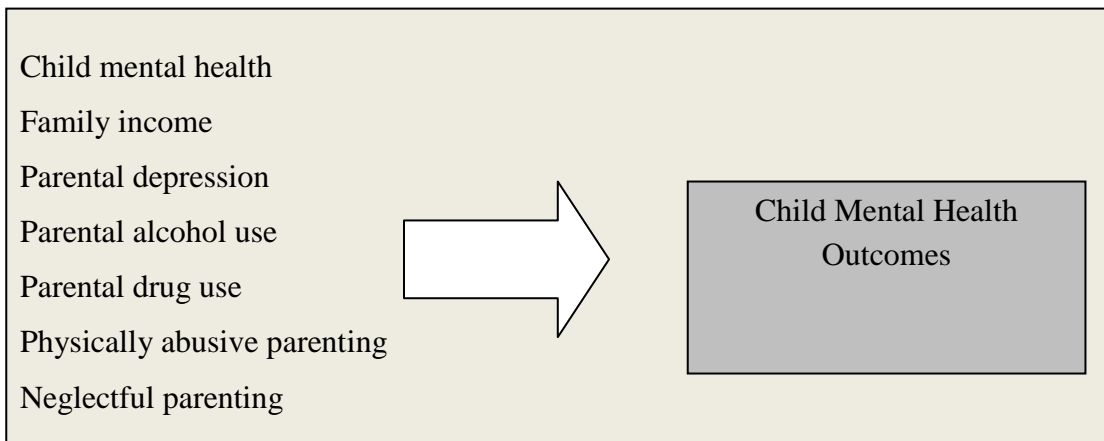
Pearson's R correlation analyses were conducted to examine the association between child mental health outcomes and family income, parental depression, alcohol use, drug use, and child age. Weighted t-tests were conducted to examine the association between family income, parental depression, alcohol use, and drug use and physically abusive and neglectful parenting.

3.4.2 Aim 2: To conduct multivariate analyses to test the direct and indirect effects of family processes on the relationship between family income and child mental health outcomes.

Aim 2 was guided by the family stress model, a conceptual framework for understanding the mechanisms through which family economic hardship impacts child development. The family stress model has been tested with samples of young children (Mistry et al., 2004; Yeung et al., 2002), adolescents (Conger et al., 1992; Conger et al., 1994; Conger et al., 1995) and low income and minority groups (Benner & Kim, 2010;

Dennis et al., 2003; Formoso et al., 2007; McLoyd, 1998; Mistry et al., 2002; Pachter et al., 2006). However, there are no known studies that have examined the association between the relationships posited in the family stress model with children involved in the child welfare system. Examining these relationships in the child welfare population is important, as family processes are often a factor in why families are associated with the child welfare system. Structural equation modeling (SEM) was used to test the family processes as a mediator between family income and child mental health. According to Kline, SEM is used for theory development and theory building (2005). Figure 3.2 demonstrates the proposed associations according to the Family Stress Model.

Figure 3.2: The family stress model applied to a child welfare population
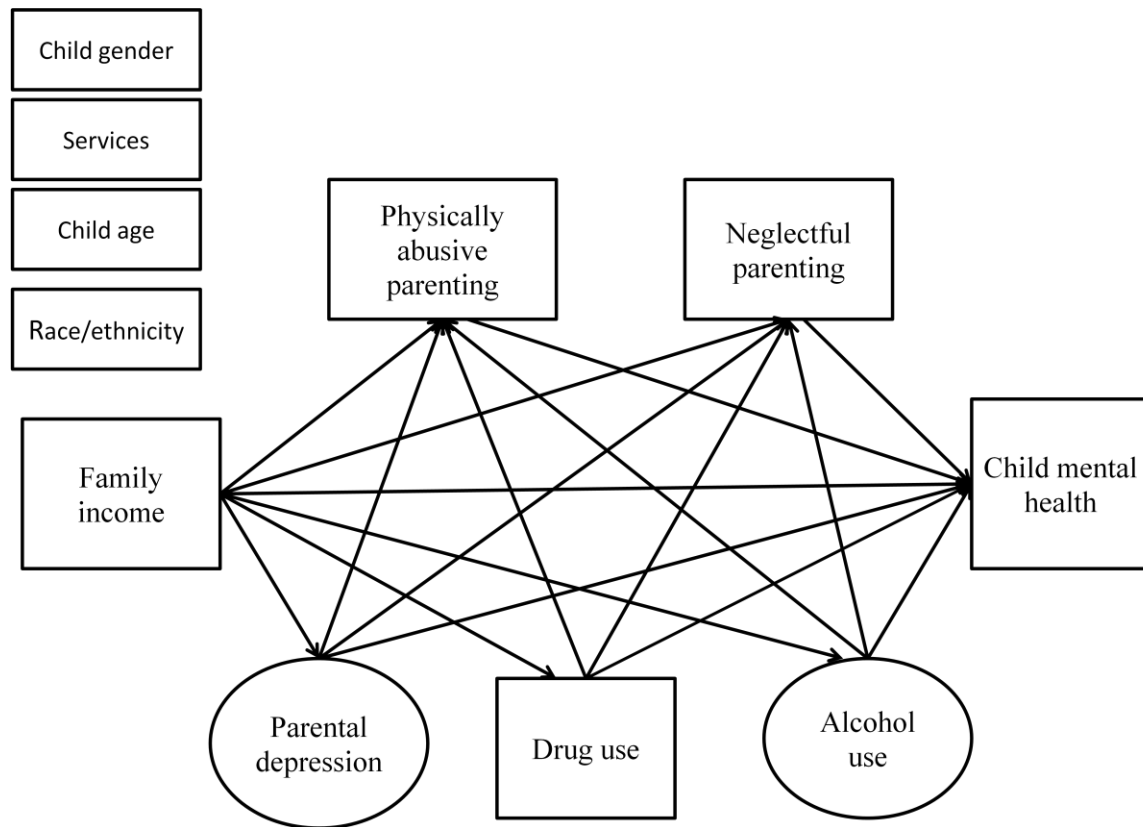
Statistical assumptions in structural equation modeling (SEM). SEM is based on

several multivariate techniques, such as confirmatory factor analysis, covariance

structural analysis, multiple regression analysis, and analysis of covariance (Kline, 2005).

SEM offers a convenient method to examine direct and indirect effects of observed and

latent variables (Byrne, 2001). As such, there are many advantages to SEM. First, SEM

allows for the analysis of predictor and outcome variables to be estimated simultaneously

using multiple regression. The advantage of estimating relationships simultaneously is

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that the dependent variables can also be modeled as independent variables (Hair, Black, Babin, Anderson, & Tatham, 2006). Second, multiple regression enables researchers to examine the direct effect of predictor variables on outcomes. SEM, on the other hand, is used to test direct and indirect effects concurrently (Hair et al., 2006). Finally, SEM includes both path analysis and confirmatory factor analysis. The use of confirmatory factor analysis in particular can reduce measurement error by using multiple items to represent a latent construct, as well as by assessing the latent factor's construct validity (Hair et al., 2006). The ability to correct for unobserved measurement bias is what strengthens the accuracy of the model estimation.

The basic composition of an SEM model includes the measurement and structural model. The structural model consists of observed factors and shows causal "paths" between exogenous (independent) and endogenous (dependent) variables. Primary observed variables in the current model include family income, parental drug use, physically abusive and neglectful parenting and child mental health. The structural model also functions as a path diagram. In contrast, the measurement model consists of latent variables that represent unobserved constructs (Byrne, 2001). Latent variables that are thought to be caused by the observed items are referred to as reflective indicator models. This kind of SEM model is referred to as a reflective indicator model. SEM models using reflective indicators are often more common in the social sciences (Bollen & Lennox, 1991). In the current model, parental depression and alcohol use are latent variables.

The measurement model is linked to the structural model by the latent factors.

Direct and indirect (mediating) effects of exogenous variables on endogenous variables are represented by a series of arrows that specify the direction of the relationship. It is important to note that variables in an SEM model can be endogenous and exogenous (Kline, 2005). In the current study, only child age, gender and receipt of developmental services were completely exogenous and child mental health was completely endogenous; all other variables served a dual function. Table 3.7 describes the variables that were included in the model and identifies how they were measured.

There are several assumptions that must be met in SEM. SEM requires a large sample size in comparison to other modeling techniques, like hierarchical linear modeling. Small sample sizes affect the estimation algorithm and create problems estimating model parameters and poor power to detect statistical differences (Kline, 2005). While there is not a set rule about how many subjects are needed to estimate a model, more complex models require a large sample size. Samples that exceed 200 cases, as in the case of the current study, are considered large (Kline, 2005). In addition to sample size requirements, Hair and colleagues (2005) suggest that other factors should be considered. These factors include the estimation technique, model complexity, missing data, and the average variance of indicators.

Table 3.7: Variables in the measurement and structural model

Variable	Scale/item	Type of variable
Family income	Income-to-needs from poverty threshold, U.S. Census Bureau	Observed (continuous)
Parental depression	Short Form Health Survey-Mental Health Component	Latent variable
Parental alcohol use	Alcohol Use Disorders Identification Test (AUDIT)	Latent variable
Parental drug use	Drug Abuse Screening Test (DAST)	Observed (continuous)
Physically abusive parenting	Parent-Child Conflict Tactics Scale (physical abuse subscale)	Observed (dichotomous)
Neglectful parenting	Parent-Child Conflict Tactics Scale (neglect subscale)	Observed (dichotomous)
Child mental health	Child Behavior Check-list	Observed (continuous)
Child age	Single item question	Observed/Control (continuous in months)
Child gender	Single item question	Observed/Control (dichotomous)
Developmental services received	Single item question	Observed/Control (dichotomous)
Parental race/ethnicity	Single item question	Observed/Control (four dichotomous dummy variables)

Another important assumption is normality of data. Data that are skewed and/or

have extreme kurtosis on the observed variables may result in difficulty with model

convergence. Other problems associated with non-normal data include a large chi-square statistic and low p-value (Kiline, 2005). However, if the sample size is very large (n>1000), departures from normality are more acceptable (Amemiya & Anderson, 1990). Finally, a critical assumption in this type of SEM model is that indicator items have high internal consistency (e.g. Cronbach's alpha), meaning that changes in one were expected to create changes in the other items (Keith, 2006). Cronbach's alpha estimates for the sample were high for the AUDIT (α = .87) and for the Short Form Health Survey-Mental Health Component (α = .81), suggesting strong internal consistency for the items in the scale.

Building and specifying an SEM model. Prior to testing the measurement and structural model, exploratory and confirmatory factor analysis were used to establish convergent and discriminate validity of the parental depression and alcohol use measures. Examining a scale's dimensionality is a necessary step in identifying whether the items of the scale measure more than one construct. This is especially important with measures where the psychometric properties of the scale have not been established in the literature (Hair et al., 2006). Exploratory factor analysis (EFA), rather than principle component analysis, was used since the objective was to test the latent dimensions of the measure rather than reduce the number of items in the scale (Hair et al., 2006). After conducting the EFA, the validity of the measurement model was tested using confirmatory factor analysis (CFA). Although model fit criteria was used to assess the validity of the measure, Hair and colleagues (2006) recommend that researchers seek additional

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evidence of convergent and discriminant validity. These methods were conducted and are reported in the results section in Chapter 4.

Parameters in the model were specified to be free rather than fixed. There were 106 parameters estimated in the model, which included latent variables and their loading estimates, error terms, and covariance terms. The structural model was a recursive model. In recursive models, the direction of the paths goes from the predictor variables to the outcome variables. In contrast, nonrecurrsive models have variables with reciprocal relationships—where the independent variable and the dependent variable are the predictor and outcomes of a single latent construct (also known as feedback loops) (Hair et al., 2006). Nonrecurrsive models are strongly discouraged with cross-sectional data and are often difficult to interpret. Finally, missing data in the SEM analysis was handed through full information maximum likelihood estimation methods, which is described in more detail in the methods section.

3.4.3 Model estimation, fit indices and testing the indirect effects

Model fit indices and estimation. In MPLUS, the inclusion of categorical and continuous variables required alternative estimating procedures. The default estimator for this approach is weighted least squares (WLSMV). This approach uses a diagonal weight matrix with standard errors and a mean-adjusted chi-square test statistic (Muthén & Muthén, 1998-2010). While other estimation methods are available, WLSMV is the recommended estimation method for continuous and dichotomous variables with missing data (Muthén & Muthén, 1998-2010).

MPLUS 6 software (Muthén & Muthén, 1998-2010) provides several indices of goodness-of-fit. Goodness-of-fit is determined by how well the estimated covariance matrix compares to the actual observed covariance matrix. The closer the values from the estimated and observed matrices are to one another, the better the model fit (Hair et al., 2006). In the SEM literature, there is no consensus regarding which fit indices should be reported (Hu & Bentler, 1999; Kline, 2005). This is because fit indices are usually based on one aspect of the model (Kline, 2005). According to Hair and colleagues (2006), the fundamental test of fit is the chi-square goodness-of-fit (GOF). In the GOF index, a model with a small chi-square and a large p-value indicates the observed sample and the estimated covariance matrix are not equal. This is the desired outcome (Hair et al., 2006). However, there are several problems associated with the GOF index. The chi-square test is sensitive to sample size and the number of parameters included in the model. Therefore, complex models with a large sample may experience large χ^2 values even though the model may actually fit well with the data (Hair et al., 2006). In fact, for samples greater than 200 with a high number of observed variables (greater than 12), significance of the χ^2 value should be expected (Hair et al., 2006). Several recommendations, such as including other model fit indices (Hair et al., 2006) and running a sensitivity analysis (Muthén, 2006), should be considered when making a decision about the validity of a model.

Other fit indices, such as Bentler's Comparative Fit Index (CFI), the Tucker Lewis Index (TLI) and the root mean square of error estimation (RMSEA) were created

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to address some of the problems associated with the conventional test of model fit (χ^2 statistic) (Bentler & Bonett, 1980; Hu & Bentler, 2000). The CFI is calculated using the ratio between discrepancies of the proposed model and the null model. This measure is not as sensitive to sample size issues as the goodness-of-fit, χ^2 statistic (Kline, 2005). Models with a value of .90 are considered acceptable; however models with CFI values of .95 and above are more desirable (Hu & Bentler, 2000). Similarly, the TLI ranges from 0-1 and depends on the correlations between variables in the data. The TLI also is not as susceptible to influence by sample size, as it adjusts for the number of parameters that are in the model. Like the CFI, models with values of .90 are considered good, although .95 and above are more desirable (Hu & Bentler, 2000). Finally, the RMSEA describes the approximate fit of the model and should be under .05 (Hu & Bentler, 2000; Keith, 2006).

        <u>Testing for mediation</u>. To test the mediation effects of family processes on the relationship between family income and child mental health, the "model indirect" command in MPLUS was used. The indirect effect is the degree, or the amount, of mediation. This is often determined by the reduction in the strength of the coefficient between in the independent and dependent variable (Kenny, 2011). Model indirect gives the total effect, which is the sum of the direct and indirect effects. Rather than speaking generally about mediation, model indirect determines if this mediation is statistically significant. This is the preferred method for establishing mediation (Shrout & Bolger, 2002), especially when latent variables are included as predictors in the statistical model (Baron & Kenny, 1986; Kenny, 2011). The general rule for the interpretation of indirect

effects is that the total effect must first be significant. In the absence of a total effect, mediation cannot occur. However, it is worth noting that some researchers suggest that establishing a total effect should not be a requirement for establishing mediation when there is a priori evidence that the effect between the independent and dependent variable is small and in the presence of a suppression effect (Shrout & Bolger, 2002). This will be discussed in more depth in the discussion section of these results.

3.4.4 Missing data

In the current sample, there is a small percentage of missing data on the endogenous and exogenous variables. Table 3.8 shows the number and percentage of missing data for each variable in the study. Failure to address missing data complicates the ability to fully estimate the models, especially when the sample size is significantly diminished (Hair et al., 2005). The default for addressing missing data in MPLUS-6 software is Full Information Maximum Likelihood (FIML). This method is superior to other ways of addressing missing data in that it generally has less bias and sampling variability than casewise or listwise deletion and mean imputation (Ender, 2001). This is especially true for data that are not normally distributed and in cases where missing data is problematic (around 20% missing) (Ender & Bandalos, 2001).

Table 3.8: Frequency (%) of missing data on exogenous and endogenous variables

Variable name	Frequency (%) of missing data
Family income	150 (9%)
Parental alcohol dependence	40 (2%)
Parental drug use	150 (9%)
Parental depression	18 (1%)
Physical abuse	30 (2%)
Neglect	33 (2%)
Child mental health	6 (<1%)
Gender	0 (0%)
Child age (in months)	0 (0%)
Developmental services	8 (0%)
Parental race and ethnicity	2 (0%)

FIML assumes that values are missing at random (MSR); an assumption less rigid than data that are assumed to be missing completely at random (Graham, 2009). In FIML, missing data are not imputed but rather, casewise likelihood functions are derived for individuals based on available data and these data are then used to estimate parameters for all data points (Enders, 2001; Enders & Bandalos, 2001). In MPLUS, missing data on exogenous variables (in this current study, this would be child gender, child age and access to disability services, and parental race/ethnicity) cannot be computed using FIML. As such, the SEM model was only estimated using 1,654 observations that did not have missing values on receipt of developmental services.

3.4.5 Data weights

Data weights, constructed for NSCAW-II restricted users, must be included in the statistical analysis. Sampling weights account for the unequal probabilities of selection, and if left out of the analysis, biased standard errors are produced (National Data Archive on Child Abuse and Neglect, 2008). Traditionally, there are three weights that are applied to the analysis: national weights, stratum weights, and case analysis weights. When used together, these weights produce national estimates of children involved in the child welfare system. Complex sample weights were applied to all bivariate and multivariate analyses. In addition to the weights, the subpopulation command in MPLUS or the domain command in SAS were used to ensure proper estimate of the standard errors (National Data Archive on Child Abuse and Neglect, 2008).

3.4.6 Multiple group analysis

Previous research has found that family processes differ by race and ethnicity (Benner & Kim, 2010; Dennis et al., 2003; Formoso et al., 2007; McLoyd, 1998; Mistry et al., 2002; Pachter et al., 2006). Testing this hypothesis among non-Hispanic white, non-Hispanic black, U.S.-born and foreign-born Hispanic parents using multiple-group structural equation modeling (MGSEM) was considered. However, significant obstacles arose with running a multiple group model with complex sampling weights. First, it is not possible to run a multiple group model with a subpopulation (i.e., a subsample of the population). Running the model without this command would lead to the bias estimation of standard errors. Second, a large sample size for MGSEM is critical. For MGSEM, the

total sample size is determined by the group with the smallest number of cases. Additionally, issues such as non-normality of data, number of parameters and missing data make the estimation of multiple group models extremely difficult. Finally, in the current study, the formative factor model was very complex. Attempts to run MGSEM models were made, but ultimately abandoned after issues of model convergence were encountered. It is recommended that future research consider ways to analyze family processes by race and ethnicity using child welfare data.

3.3.7 An alternative structural equation model with formative factors

In measurement theory, latent variables are thought to be caused by the observed items. This kind of SEM model is referred to as a reflective indicator model. However, a less common approach is a latent variable comprised of causal indicators. This type of model is called a formative indicator model. In this case, the indicators *cause* or *form* the formative factor (Hair et al., 2006). Formative indicator models have different assumptions than do conventional (e.g., reflective indicator) structural equation models. The key assumption in this model is that the constructs are not considered latent; rather "they are viewed as indices where each indicator is a cause of the construct" (Hair et al., 2006, p. 786). Whereas in a reflective SEM model, items are said to be interchangeable; the removal of an item in a formative factor indicator model is "omitting a part of the construct" (Bollen & Lennox, 1991, p. 308). Variables in a formative factor should account for a considerable portion of the variance in the formative construct and should be correlated with other items in the structural model (Hair et al., 2006). Second, in a

reflective indicator model, measurement error is important to establishing construct validity. However, in a formative measurement model, the error is related to failure to explain the construct. Thus, the error is in the factor and not in the measured items (Hair et al., 2006). Third, high internal consistency is not required in formative measurement models, as the formative indicators do not have to be correlated. Fourth, indicators in a formative measurement model predict the factor; in other words, these indicators explain most of the variance of the factor (Hair et al., 2006). The final difference is that formative models, if run in isolation (e.g., without the structural model), are often statistically unidentified (Bollen & Lennox, 1991). As such, these measurement models must be embedded within a larger model, and even when this assumption is met, mathematical convergence can be a challenge (Diamantopoulous & Winklhofer, 2001).

Originally, the current study proposed examining an SEM model with formative factors. In this model, clinical levels of parental depression, alcohol use and drug use were included as factors of parental functioning. Indeed, family income predicted parental functioning and the latter factor was associated with child mental health outcomes. Despite evidence of the strong effect of parental functioning on child mental health, this model did not reveal which aspects of parental functioning were directly associated with child mental health. Moreover, the SEM model with formative factors produced poor model fit criteria. The results from this model can be found in the Appendix A. The following chapter presents results from an SEM model with reflective factors, which was described in the beginning of the Chapter 3. While the estimation

methods of these SEM models are distinct, it is important to note that the research aims

and questions that were proposed in the beginning of the study did not change.

CHAPTER 4: RESULTS FROM THE BIVARIATE AND MULTIVARIATE ANALYSES

The purpose of this study was to understand the mechanisms that translate economic hardship to poor outcomes among children involved in the child welfare system. In particular, this study examined the role of family processes in understanding the relationship between family income and child mental health.

4.1 Aim 1: Descriptive statistics

The purpose of Aim 1 was to provide a descriptive analysis of child mental health, as measured by the Child Behavior Checklist Total Problem Scale (CBCL) including variations by income-to-needs and family processes. Descriptive statistics, including sample means, frequencies, Pearson's R correlations and weighted t-tests were conducted to identify whether child mental health outcomes differed by family processes.

4.1.1 Sample characteristics

Unweighted frequencies and percentages for categorical variables can be found in Table 4.1. The current sample was composed of 1,667 children, 18 months to 11 years of age, who lived with a permanent caregiver. The majority of children in the sample were male (55.64%), which is slightly higher than the percentage found in other national estimates of the child welfare population (51.2%) (U.S. Department of Health and Human Services, 2011). Children in the sample had a mean age of 70 months or about six years old. More than 85% of the children lived with a biological mother or a biological father. A small proportion of children lived with adopted parents, grandparents, or step-

parents (3.83%). The permanent caregiver's relationship to the child was unknown for

about 10% of the sample.

The racial and ethnic background of parents is similar to previous research (U.S.

Department of Health and Human Services, 2011). The largest percentage of the parents

identified as non-Hispanic white (48.45%), followed by Hispanic (26.04%) and non-

Hispanic black (19.46%).[4] The mean age of parents was 33.71 (SD = 1.87) years of age.

Household characteristics indicated that families involved in the child welfare system

were significantly disadvantaged, as nearly three-quarters of the sample (71.78%)

reported being divorced, separated, widowed or never married. The unweighted mean

yearly income of families in the child welfare sample was $28,312 (median = $18,001).

The unweighted mean household size for children in the sample was 4.64 (SD = 1.88).

Low educational attainment and high unemployment were also present among primary

caregivers in the sample. Approximately 35% of primary caregivers reported some

college or vocational training, while roughly 22% reported school through the 12 grade

and 36% reported less than a high school education. It is important to note that only 5%

reported having completed a four year degree. Although most caregivers in the sample

reported being employed, roughly 45% reported full-time or part-time work, while the

rest of the sample were unemployed or under employed (35%) or unemployed and not

looking for work (20%). In addition, 4% of caregivers reported working more than one

job. The percentage found in the study was about three times higher than the national

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[4] There were 101 (6.0%) of parents who reported their race/ethnicity as "other." Another 0.25% of parent's race/ethnicity was missing.

unemployment rate in 2008 (United States Department of Labor, 2012)—the year

NSCAW-II data were collected.

Table 4.1: Characteristics of the sample population with key categorical variables

Variables	Unweighted frequencies (percentages) [5]
Parental race/ethnicity	
non-Hispanic white	794 (48.45%)
non-Hispanic black	391 (19.46%)
Hispanic	379 (26.04%)
other	101 (6.05%)
Parental education	
less than high school	590 (36.11%)
high school	370 (22.93%)
some college/technical education	612 (35.45%)
four year college degree	90 (5.13%)
ungraded placement	4 (0.38)
Primary caregiver employment	
full-time employment	490 (32.57%)
part-time employment	199 (12.40%)
unemployed, not looking for work	513 (30.75%)
underemployed	81 (4.18%)
unemployed and looking for work	382 (20.10%)
Parental marital status	
married	425 (28.22%)
separated/divorced/widowed	514 (35.17%)
never married	726 (36.61%)
Child gender	
male	909 (55.64%)
female	758 (44.36%)
Developmental services received	
received developmental services	253 (13.52%)
Physically abusive parenting	
abusive parenting	1071 (65.68%)
Neglectful parenting	
neglectful parenting	365 (21.65%)

[5] Numbers may not add up to sample size of 1667 due to missing data. Percentages add up to 100%, as they are based on valid data.

4.1.2 Child mental health

        To answer the first research question from Aim 1(What are the mental health outcomes of children with child welfare involvement?), a weighted mean was computed. Weighted mean scores for child mental health in the sample were slightly above the national average of 50 ($M = 52.09$, $SE = .48$). Scores for children in the sample ranged from 24-91. A score of 64 and above indicates clinically significant problem behavior. In the sample, 333 (20.05%) children had a score of 64 and above, indicating that they have significant mental health problems. Additionally, 459 (27.63%) of children received scores in the "borderline" clinical range, indicating that they may be demonstrating some significant problem behavior; although not yet at a level of impairment. Roughly 30% of children in the sample scored around the national mean; with 63 children (3.79%) receiving a score of 50. All together, 725 (38.59%) children in the sample received scores that were below the national norm, suggesting evidence of little or no mental health problems. See Table 4.2 for the frequency distribution of CBCL scores for children in the sample.

Table 4.2: Frequency distribution of CBCL scores for children in the sample

Total Problem Scale Score	Frequency (percent) of children with CBCL range
24-33	86 (5.18%)
34-43	292 (17.56%)
44-53	491 (29.58%)
54-63	459 (27.63%)
64-73	254 (15.29%)
74-83	72 (4.34%)
Above 83	7 (0.42%)

Key child demographic variables were associated with child mental health (results not shown in a table). A Pearson's R correlation indicated that child age was significantly associated with child mental health outcomes ($r = .15$, $p = <.001$). The direction of the coefficient suggested that older children received higher scores on the CBCL, indicating greater mental health problems. Likewise, other demographic characteristics such as child gender ($t = -3.49$, $p = .008$) and receipt of developmental services ($t = 7.63$, $p = <.001$) were associated with greater mental health problems. Male children, and children who received an individualized family service plan or an individualized education plan, had higher mental health scores. Using dichotomous variables, the relationship between parental race/ethnicity was tested using weighted t-tests. Children whose parents reported their race as non-Hispanic white received higher scores on the CBCL ($t = 2.64$, $p = .01$), indicating more problematic behavior. Differences in mental health scores for non-

Hispanic black, Hispanic and "other" race/ethnic categories were not statistically significant.

4.1.3 Child mental health, family income and family processes

To answer the second research question (How do child mental health outcomes vary by family income and family processes?), several Pearson's r correlations were tested. Table 4.3 shows the mean, standard error of the mean and Pearson's r correlation coefficients between family income, family processes, and child mental health outcomes. The Pearson's r coefficient for family income and child mental health was negative ($r = -.07$, $p <.01$), indicating that children in households with greater economic needs were more likely to receive poorer mental health scores. Although the coefficient is statistically significant, it is important to note that the strength of the coefficient was weak.

Table 4.3: Means and Pearson's R correlation coefficients for continuous variables

Variable	Weighted Mean (SE of Mean) [6]	Child mental health (n= 1661)	Family income (n = 1517)[7]	Parental depression (n=1649)	Parental alcohol use (n= 1627)	Parental drug use (n = 1517)
Child mental health	52.09 (.48)	--	-.07*	-.32***	.08*	-.00
Family income	1.22 (.13)	--	--	.06*	.06*	-.06*
Parental depression	48.65 (.39)	--	--	--	-.12***	-.17***
Parental alcohol use	1.47 (.89)	--	--	--	--	.19***
Parental drug use	0.89 (.07)	--	--	--	--	--

***p<0.001, **p<0.01, *p<0.05

To understand how child mental health outcomes vary by family processes (research question 2 for aim 1), measured by parental depression, alcohol use, drug use and physically abusive and neglectful parenting, Pearson's R correlations and weighted t-tests were conducted. Starting with parental depression, the mean score was 48.65 (SE = 0.39). The standardized national average is 50, with higher scores indicating lower depressive symptoms. The mean score in the sample for parental depression is slightly lower than the national mean, indicating that parents in the sample reported greater depressive symptoms (as measured by six items from the mental health component of the

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[6] The standard error of the mean was reported in all weighted analysis. This is because it is not possible to calculate a standard deviation with weighted data. The standard error of the mean represents the confidence of the estimate in the mean, while weighted standard deviations are a representation of the entire population.
[7] Recall that there were 150 observations in family income missing. Family income was not imputed for the bivariate analyses but were imputed using Full Information Maximum Likelihood in the SEM model.

SF Health Survey) than adults in the general population. The measure of parental

depression was negatively correlated with child mental health (r = -.32, p = .001). This

suggests that parents, who reported greater depressive symptoms, also reported more

mental health problems in their children.

The mean of parental alcohol use, measured by the AUDIT, was 1.47 (SE = .89).

A score of six and above on the AUDIT indicates alcohol misuse. Results from the

current study suggest that parents in the sample, on average, did not demonstrate

clinically significant alcohol behavior. The low self-reported parental alcohol use may be

the result of social desirability bias—as parents involved in the child welfare system may

be less likely to report substance use given that admittance of problematic behavior could

affect the outcome of a child welfare investigation. The bivariate association between

parental alcohol use and child mental health was significant and in the proposed direction

(r = .08, p = .002). The association was positive, suggesting mental health scores were

higher among children whose parents reported greater alcohol use. Similarly, the mean

score for parental drug use was .89 (SE = .07). As in the case of parental alcohol use,

parental self-reported drug use was very low in the sample—which may also be related to

social desirability bias. The mean score suggests that few parents in the sample reported

significant drug use. Contrary to the research hypothesis, parental drug use was not

significantly correlated with child mental health (r = -.00, p = .95); such that parental

drug use was not statistically associated with greater mental health problems in children.

Finally, weighted t-tests indicated that physically abusive (t=5.76, p = <0.001) and

neglectful parenting (t = 4.29, p = <0.001) were positively associated with child mental

health outcomes; such that parental reports of physical abuse and neglect were associated

with higher scores on the child mental health measure.

4.1.4 Family income, parental functioning and child maltreatment

To answer the third research question in Aim 1(What is the association between

family income, parental functioning and physically abusive and neglectful parenting?),

weighted t-tests were conducted. Contrary to the research hypothesis, the weighted t-

statistic between family income and neglectful parenting was not significant. Despite a

non-significant t-value (t= -1.75, p = .08), the direction of the coefficient was in the

hypothesized direction.

To understand which aspects of parental functioning were associated with

neglectful parenting, a series of weighted t-tests were conducted with parental depression,

alcohol use and drug use measures. The results from these analyses are presented in

Table 4.3. As hypothesized, all three measures of parental functioning were associated

with child neglect. The mean score for parental depression was lower (indicating worse

mental health) for parents who reported neglectful parenting than it was for parents who

did not report neglectful parenting (M = 44.17, 49.35 respectively). The measure of

parental depression had the strongest relationship to neglectful parenting (t = -.3.80, p =

.000). The negative direction of the coefficient suggests that greater depressive symptoms

were associated with a higher incidence of neglectful parenting. Similarly, the mean

scores for parental alcohol use (M = 2.04, 1.32) and drug use (M= 1.39, .76) were higher

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among parents who reported neglectful parenting compared with parents who did not

report neglectful parenting. Weighted t-tests indicated that these mean differences were

statistically significant; such that parental alcohol use (t = 2.67, p = .009) and drug use (t

= 2.56, p = .01) were associated with a higher incidence of neglectful parenting.

Table 4.4: Weighted t-tests with family income, measures of parental functioning and

child neglect

Variable	Neglectful parenting weighted Mean (SE)	No neglectful parenting weighted Mean (SE)	Weighted t-test statistic
Family income	.95 (.08)	1.29 (.17)	-1.75
Parental depression	44.17 (1.31)	49.86 (.44)	-3.80***
Parental alcohol use	2.04 (.25)	1.32 (.09)	2.67**
Parental drug use	1.39 (.22)	.76 (.08)	2.56*

***p<0.001, **p<0.01, *p<0.05

The relationship between family income, parental depression, alcohol use, and

drug use and physical abuse was tested using weighted t-tests. Results from these

analyses are reported in Table 4.4. Contrary to the research hypothesis, the relationship

between family income and physically abusive parenting was not statistically significant

(t = 1.18, p = .24); and in fact, was not in the hypothesized direction. The positive

direction of the coefficient suggests that higher income families reported more physically

abusive parenting. Parental depression was associated with physical abuse (t= -2.74, p =

.008); such that greater depressive symptoms were associated with a higher incidence of self-reported physically abusive parenting. Interestingly, parental alcohol use had the strongest relationship to physically abusive parenting. Greater parental alcohol use was associated with a higher self-report of physical abuse (t = 5.38, p = <.001). Yet, contrary to the research hypothesis, drug use was not statistically associated with physical abuse (t = 1.22, p = .22).

Table 4.5: Weighted t-tests with family income, measures of parental functioning and physical abuse

Variable	Physically abusive parenting weighted mean (SE)	No physically abusive parenting weighted mean (SE)	Weighted t-test statistic
Family income	1.30 (.20)	1.04 (.07)	1.18
Parental depression	47.87 (.47)	50.06 (.70)	-2.74**
Parental alcohol use	1.78 (.12)	.89 (.12)	5.38***
Parental drug use	.94 (.08)	.79 (.10)	1.22

***p<0.001, **p<0.01, *p<0.05, + <0.10

4.1.5 Summary of bivariate results

The results indicated that child mental health outcomes were above the national average but below the clinical cut-off level of impairment. In fact, a mean of 52.09 suggest that on average, children in the sample were close to the national norm. Low

family income was associated with higher child mental health scores (indicating more mental health problems); although the strength of the coefficient is weak. In addition, four of the five measures of family processes were associated with child mental health; such that measures of parental depression, alcohol use and physically abusive and neglectful parenting were associated with worse mental health outcomes among children in the study sample. Contrary to the research hypothesis, parental drug use was not associated with child mental health outcomes. Finally, there was some variation in the relationships between parental functioning measures and child maltreatment. In terms of neglect, all three measures of parental functioning (parental depression, alcohol use and drug use) were associated with a higher incidence of neglectful parenting but family income was not. In contrast, only parental depression and alcohol use were associated with a higher incidence of physical abuse, while parental drug use and family income were not. The following section will describe how these relationships work together in a structural equation model.

4.2. Aim 2: Results from the structural equation model

A structural equation model was conducted using reflective factors. A summary of the main findings of this model can be found in Table 4.6.[8]

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[8] According to Bollen and Lennox (1991) there are two ways to estimate a structural equation model. The first is with formative factors and second is with reflective factors. In the current study, both SEM models were tested. The SEM model with formative factors produced poor model fit. The model with formative factors is presented in Appendix A. While the estimation methods of these SEM models are distinct, it is important to note that the research aims and questions that were proposed in the study did not change.

4.2.1 Exploratory factor analyses

Recall from the methods section, that the first step to building a structural equation model is to conduct exploratory factor analysis with the latent variables. Exploratory factor analysis with Varimax rotation was conducted with the AUDIT and SF Health Survey-Mental Health Component using MPLUS 6 software. Varimax rotation is an orthogonal rotation method and is typically used to disentangle the contribution of each of the factors in the measure. Two criteria were used to determine the factor structure of the measures. First, Hair and colleagues (2006) suggest the researchers examine previous empirical evidence. Although there was limited information on the psychometric properties of the SF Health Survey-Mental Health Component, there were several studies examining the factor structure of the AUDIT. Creators of the AUDIT indicate that the measure is unidimensional, meaning that it reliably measures a single concept (Babor, et al., 2001). However, in a review of research studies using the AUDIT, Doyle and colleagues (2007) found than in many studies the AUDIT had a two, three and even four factor solution. The second criterion used was using the latent root or eigenvalue to get a descriptive look at the number of factors or constructs measured by the items in the scale. A general rule is that eigenvalues greater than 1.00 are retained as a factor (Hair et al., 2006). In the current study, neither the SF Health Survey-Mental Health Component nor the AUDIT had more than 1 eigenvalue over 1.00. This finding suggests that both scales are measuring one underlining latent concept.
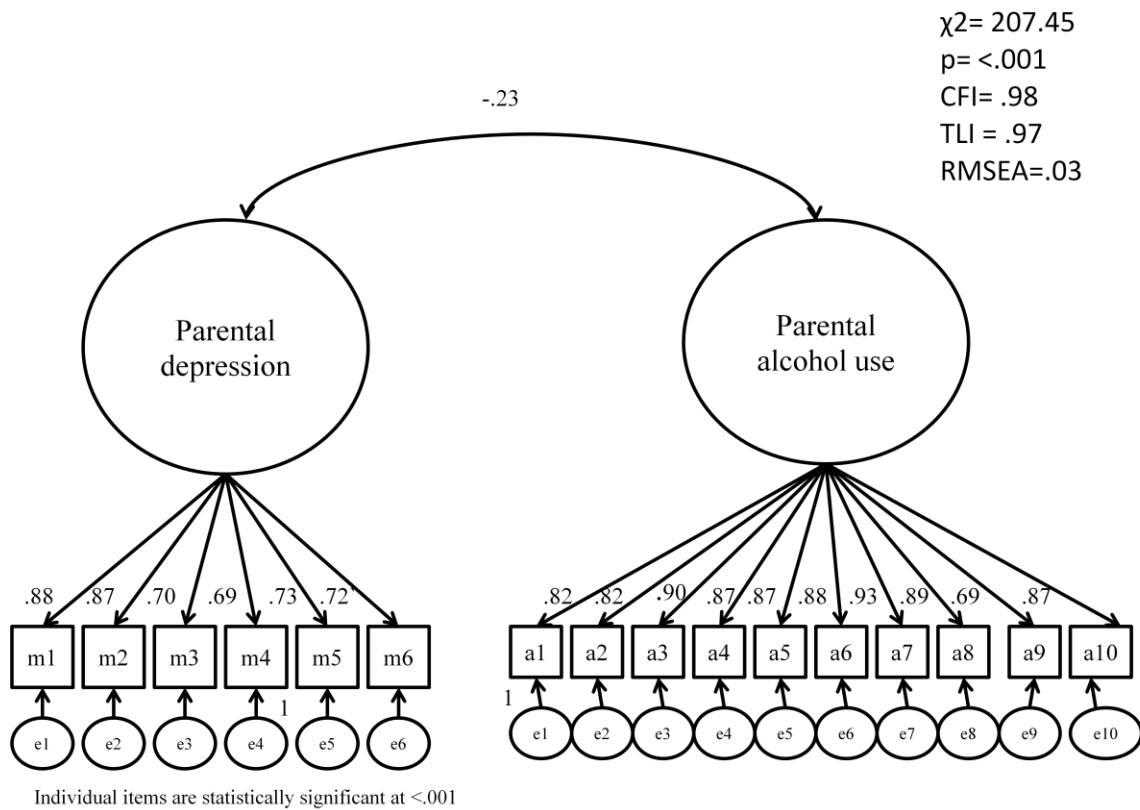
4.2.2 Confirmatory factor analysis

Once it was established that the SF Health Survey-Mental Health Component and the AUDIT were unidimensional measures, a confirmatory factor analysis was used to assess the measurement model (which consisted of two latent variables: parental depression and alcohol use). Model fit criteria were used to assess the validity of the measurement model. The chi-square test of model fit was, $\chi^2 = 207.45$ (103, N = 1665), $p = <.001$. Although it is optimal to have a non-significant chi-square value, the chi-square statistic value is sensitive to large sample sizes and models with more than 12 observed parameters (Hair et al., 2006). All other fit indices indicated excellent model fit; CFI = .98, TLI = .97 and RMSEA =.03.

The general rule is that factor loadings should be statistically significant and each loading should not be below .50—although .70 is optimal (Hair et al., 2006). Figure 4.1 shows the measurement model with the standardized factor loadings for parental depression and alcohol use. The squares represent the individual items of the scale and the circles represent the measurement error associated with the item. Factors loading on the SF Health Survey-Mental Health Component and the AUDIT were statistically significant at $p = <.001$. For the SF Health Survey-Mental Health Component, one factor (M4) fell slightly below the .70 cut-off. In contrast, all of the factor loadings for the AUDIT were above the .70 threshold. Evidence from the factor loadings, taken with the high standardized internal consistency scores (α=.81 for the SF Health Survey-Mental

Health Component and α = .87 for the AUDIT), suggests convergent validity in the measurement model.

Another way to examine convergent validity is by calculating the total variance extracted from the items. This is computed by squaring the standardized factor loading and dividing the sum of squares by the number of items in the scale. The variance extracted should be .50 and above to demonstrate convergent validity. If the calculation is less than .50 this suggests that more error remains than is explained by the latent factor. The variance extracted from the SF Health Survey-Mental Health Component was .58 and from the AUDIT was .71—both meeting the criteria for convergent validity. Next, discriminant validity was tested. Discriminant validity is the extent to which the two latent factors are unique—that is, they do not measure the same thing. This is calculated by comparing the variance-extracted percentages with the square of the correlation estimate for the two latent constructs. The variance estimated for each construct should be greater than the squared correlation estimate (Hair et al., 2006). The correlation between the two latent variables was -.23 and the square of this coefficient is .05. This value was smaller than the percentage of variance (.58 for the SF Health Survey-Mental Health Component and .71 from the AUDIT) extracted from each of the latent variables. Thus, results from the measurement model suggest discriminant validity.

Figure 4.1: Confirmatory factor analysis

χ2= 207.45
p= <.001
CFI= .98
TLI = .97
RMSEA=.03

Individual items are statistically significant at <.001

4.2.3 Findings from the structural equation model

Recall, the purpose of study aim 2 was to test the mediating effects of family processes on the relationship between family income and child mental health outcomes. The direct effects of demographic, family income and family process variables on child mental health outcomes are presented in this section, followed by a description of the mediating relationships. The model fit criteria indicate the accuracy and confidence in the validity of the relationships. The R^2 value for child mental health was .42, suggesting that

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the dependent variables in the model explained 42% of the variance in child mental health scores.

The chi-square test of model fit was significant, $\chi2 = 684.82$ (276, N=1657), $p = <.001$. The significant chi-square was likely related to the sample size and the number of observed variables estimated in the model. Model fit indices suggested an adequate model (CFI= .93, TLI= .91, RMSEA= .03). The standardized path coefficients are presented in the text as well as in Figure 4.2. The bolded lines represent statistical significance ($p = .05$), while the dotted lines represent non-significant paths.

Direct pathways to child mental health. Demographic characteristics, such as child age ($b= .11$ $p =.002$), gender ($b= -.11$ $p =.01$) and receipt of developmental services ($b=.27$, $p = <.001$) were associated with child mental health scores. Older children, as well as male children, and children who received an individualized family service plan or an individualized education plan received higher scores on the Child Behavior Checklist; indicating worse mental health outcomes. Parental race and ethnicity *was not* associated with greater scores on the CBCL, indicating that race and ethnicity did not have direct influence on mental health scores among children in the sample[9].

Pearson's R correlations showed a negative relationship between family income and child mental health ($r = -.07$, $p = .01$), indicating that a lower income-to-needs ratio (e.g., economic hardship) was associated with greater parental depressive symptoms. The strength of the coefficient (-.07) was less than .10, indicating a significant, but weak

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[9] Note that non-Hispanic white caregivers were the reference group.

relationship. Although hypothesized to have a weak effect, the direct path from family income to child mental health in fact became insignificant once other paths were included in the model.

Family processes were operationalized as parental depression, alcohol use, drug use, and physically abusive and neglectful parenting. Controlling for child age, gender, receipt of developmental services and parental race/ethnicity, only the direct path from parental depression to child mental health was significant (b= -.36, p =<.001). Higher scores on the SF Health Survey-Mental Health Component indicated **better** parental health; as such, the negative direction of the coefficient suggests that parental depressive symptoms were associated with greater mental health problems in children. Contrary to the research hypothesis, the direct path from drug use (b= -.00, p = .96) and alcohol use (b= .01, p = .82) to child mental health was not significant. Finally, bivariate ordinary least squares regression equations indicated a positive relationship between physically abusive (B= 5.75, SE = .10, p = <.001) and neglectful (B= 5.01, SE = 1.2, p = <.001) parenting and child mental health. However, with all other variables in the model, only physically abusive parenting remained a statistically significant predictor of higher mental health scores (b=.31, p = <.001) while neglectful parenting (b = .06, p = .23) lost statistical significance.

Figure 4.2: Standardized path coefficients
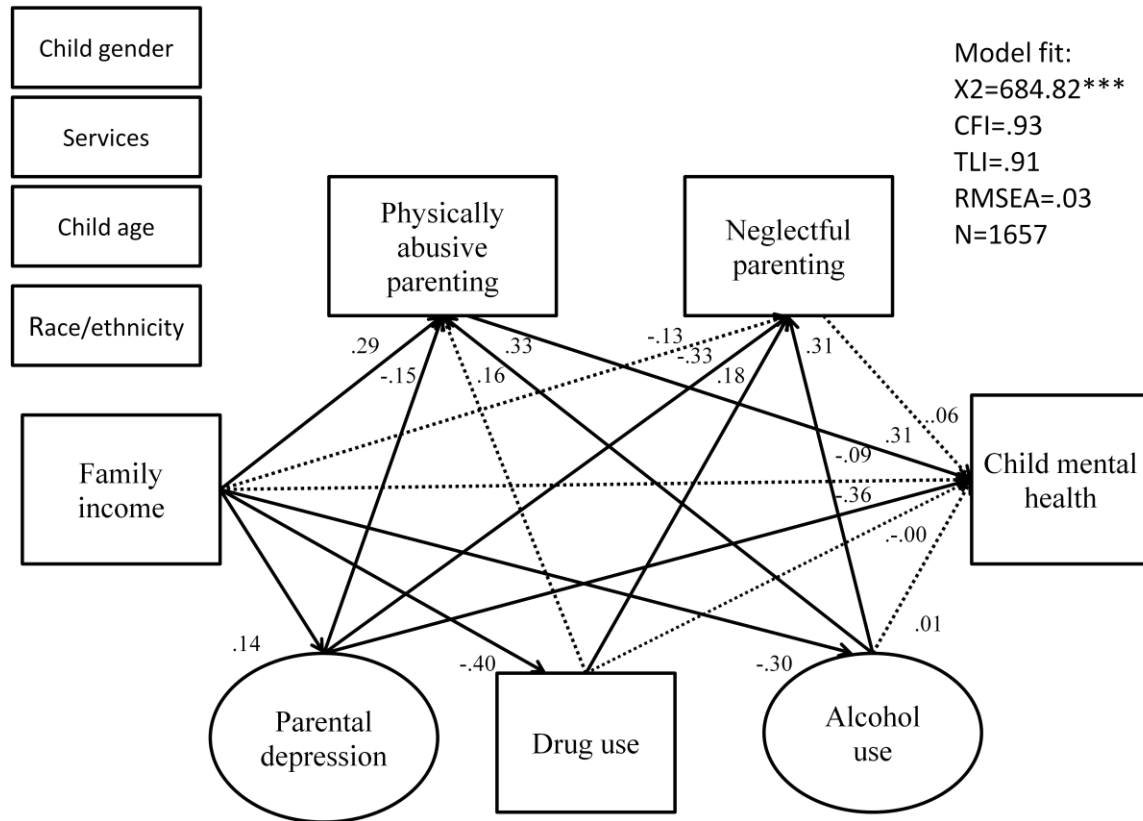
Bolded paths are significant at <.05.

Direct effects of income on family processes. The second hypothesis under aim 2

suggested that lower income-to-needs (more economic hardship) would increase parental

depressive symptoms and substance use among caregivers. In turn, these indicators

would increase physically abusive and neglectful parenting. Family income was

associated with all three measures of parental functioning: parental depression ($b = .14$, p

$= <.001$), parental drug use ($b = -.40$, $p=<.001$) and alcohol use ($b = -.30$, $p = < .001$),

and in the hypothesized direction. Controlling for child age, gender and parental

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race/ethnicity, lower income-to-needs ratios were associated with greater parental

depression, alcohol use and drug use. These results provide evidence in support of the

research hypothesis. Likewise, the direct effects of family income on physically abusive

parenting was statistically significant ($b = .29$, $p = .02$). This is interesting given that the

bivariate relationship was not statistically significant. Since the relationship between

family income and physical abuse became larger when parental functioning variables

(depression, alcohol use and drug use) were introduced into the model, this suggests that

the initial relationship was suppressed (see Warner, 2013 for an explanation of

suppression variables) and only became apparent when the variance associated with

parental functioning variables was uniquely accounted for in the analysis. Finally, while

the relationship between family income and neglect is well established in child welfare

research, the current study found that the relationship between family income and child

neglect was not significant ($b = -.13$, $p = .37$).

 <u>Direct effects of parental functioning on physical abuse and neglect.</u> The effects

of parental depression, alcohol use and drug use differed by maltreatment type.

Controlling for the effects of child age, gender and parental race/ethnicity, the direct

paths from parental depression ($b = -.15$, $p = .003$) and alcohol use ($b = .33$, $p = <.001$) to

physical abuse was statistically significant and in the hypothesized direction. Parents who

reported greater depressive symptoms and alcohol use were more likely to report

physically abusive parenting. However, after controlling for child age, gender and

parental race/ethnicity, parental drug use was not associated with greater physically

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abusive parenting ($b = .16$, $p = .06$); although the coefficient was approaching significance. For neglectful parenting, all three measures of parental functioning (e.g., parental depression, alcohol use and drug use) were significant. Greater depressive symptoms ($b = -.33$, $p = <.001$), alcohol use ($b = .31$, $p = <.001$) and drug use ($b = .18$, $p = .02$) were associated with a higher prevalence of neglectful parenting.

4.2.4 Testing mediation: Do family processes mediate the relationship between family income and child mental health?

In research question 1 (under aim 2) the goal was to test whether family processes (measured by parental depression, parental drug use, alcohol problem behavior and physically abusive and neglectful parenting) mediated the relationship between family income and child mental health outcomes. Table 4.5 provides a summary of the standardized total, direct and indirect effects that were tested in SEM analyses.

The mechanisms that translate family income to poor child mental health were examined through measures of parental depression, alcohol use, drug use, and physically abusive and neglectful parenting. First the direct effect of family income on child mental health was insignificant ($b = -.09$, p = .57). The path from family income to child mental health through the <u>indirect effects</u> of alcohol ($z = -.00$, $p = .82$) and drug use ($z = .00$, $p = .96$) and neglectful parenting ($z = .00$, $p = .43$) were not statistically significant. The path from family income to child mental health through physical abuse was significant ($z = .09$, $p = .02$). Likewise, the path from family income to child mental health through parental depression was significant ($z = -.05$, $p = <.001$). Since the total effect of these

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paths was not significant, physical abuse and parental depression were not considered

mediators. Failure to find mediating effects of parental depression, alcohol use and

physically abusive and neglectful parenting on the relationship between family income

and child mental health is likely related to the weak total effect of family income on child

mental health.[10] However, this is not to say that family income was not important in

understanding the other factors in the model. Rather, the effects of family income were

far more indirect than originally hypothesized.

In an effort to understand the mechanisms that translate family income to poor

child mental health outcomes, other mediating relationships were examined. Parental

depression is a strong indicator of child mental health. The total effect is statistically

significant in the negative direction, indicating that higher depressive symptoms were

associated with worse child mental health outcomes ($b= -.42$, $p = <.001$). The indirect

effects from parental depression to child mental health were physically abusive and

neglectful parenting. Only physically abusive parenting proved to be a significant

mediator of child mental health ($z = -.05$, $p = .007$); neglectful parenting as an indirect

path was not significant ($z = -.02$, $p = .27$). It is important to note that the direct effect of

parental depression ($b = -.37$, $p = < .001$) on child mental health was stronger than the

indirect paths ($z = -.06$, $p = .02$), indicating that parental depression was a stronger

predictor of child mental health outcomes than the indirect effect through physically

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[10] In a separate analysis, ordinary least squares regression detected a statistically significant effect of poverty on child mental health, but after controlling for child age, gender, receipt of developmental services and parental race/ethnicity, the total effect of income-to-needs on child mental health was not significant.

abusive parenting—although both were clearly important factors in understanding poor child mental health outcomes.

Alcohol use was also an important predictor of child mental health—but only indirectly. The total effect of alcohol use on child mental health was significant ($b = .14$, $p = .003$) as were the indirect effects ($z = .12$, $p = .001$); and in particular, the indirect effects of physical abuse on the relationship between alcohol use and child mental health was significant ($z = .11$, $p = <.001$). Since the direct effects of alcohol use on child mental health was not significant, this suggests that physically abusive parenting fully mediated (also known as a spurious effect) the relationship between parental alcohol use and child mental health—such that physically abusive parenting was the mechanism that translated parental alcohol use to poor child mental health. Contrary to the hypothesis, the indirect effect of neglectful parenting on the relationship between alcohol use and child mental health was not significant ($z = .01$, $p = .25$).

The total effects of drug use on child mental health was not significant ($b = .05$, $p = .14$), nor were the direct effects ($b = -.00$, $p = .96$). However, the indirect effects of drug use on child mental health through physically abusive parenting was significant ($z = .27$, $p = .05$). Contrary to the research hypothesis, the path from drug use to child mental health mediated by neglectful parenting ($b = .07$, $p = .26$) was not significant. Since the total effect of drug use on child mental health was not significant, physically abusive parenting cannot mediate the relationship.

Although the hypothesized relationship between family income and child mental health was unfounded, family income remained an important *predictor* of other variables in the model. When parental alcohol use and physically abusive parenting were included together as mediators between family income and child mental health, the results showed a statistical relationship ($z = -.03, p = <.001$). This pattern was similar when parental depression and physical abuse were included as mediators between family income and child mental health ($z = -.00, p = .03$). These findings suggest that the impact of low income may have a cumulative effect; whereas when family income, parental depression, alcohol use, drug use, and physically abusive parenting were combined, these were strong risks for child mental health problems.

The total effect of family income on physical abuse was not significant. However, the indirect effects of drug use, alcohol use and parental depression together were significant ($z = -.18, p = <.001$); likely affected by the significant indirect paths of alcohol use ($z = -.10, p = .001$) and parental depression ($z = -.02, p = .02$) on the relationship between family income and physical abuse. Additionally, the direct effect of family income on physical abuse was also significant ($b = .29, p = .02$). The change from non-significance (found in the bivariate analysis) to significance when parental functioning variables were included in the model suggests a suppression effect; such that the association between family income and physical abuse is less apparent when measures of parental functioning are not included in the model. This suppression effect is further

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supported by the opposite signs between the total effect ($b = .11$, $p = .19$) and the indirect

effect ($z = -.18$, $p = <.001$).

Finally, the total ($b = -.08$, $p = .43$) and direct effects ($b = .13$, $p = .87$) of family

income on neglect were insignificant; although the accumulation of the indirect effects

was significant ($z = -.21$, $p = .001$). Family income was associated with neglectful

parenting through parental depression ($z = -.05$, $p = .007$), alcohol use ($z = -.09$, $p = .008$)

and drug use ($z = -.07$, $p = .03$). Again, because the total and direct effect of family

income on neglect was not significant, it would be incorrect to assume that this

relationship was mediated—although it is worth noting that this interpretation of the

relationship may vary depending on the criteria. Despite significant documentation of the

effects of family income on neglect, this study failed to establish the direct and indirect

effects of parental self-report of neglectful parenting on child mental health.

Table 4.6: Standardized coefficients for total, direct and mediated pathways

Independent variable ⟶ Mediator ⟶ Dependent variable	Total effect	Direct effect	Indirect effect
Family income ⟶ Child mental health		-.09	
Family income ⟶ Family processes ⟶ Child mental health	-.06		-.02
Family income ⟶ Parental depression ⟶ Child mental health			-.05***
Family income ⟶ Parental alcohol use ⟶ Child mental health			-.00
Family income ⟶ Parental drug use ⟶ Child mental health			.00
Family income ⟶ Physical abuse ⟶ Child mental health			.09*
Family income ⟶ Child neglect ⟶ Child mental health			.00
Family income ⟶ Physical abuse		.29*	
Family income ⟶ Parental functioning ⟶ Physical abusive	.11		-.18***
Family income ⟶ Parental depression ⟶ Physical abusive			-.02*
Family income ⟶ Parental alcohol use ⟶ Physical abuse			-.10***
Family income ⟶ Parental drug use ⟶ Physical abuse			-.06
Family income ⟶ Child neglect		-.13	
Family income ⟶ Parental functioning ⟶ Child neglect	-.08		-.21***
Family income ⟶ Parental depression ⟶ Child neglect			-.05**
Family income ⟶ Parental alcohol use ⟶ Child neglect			-.09**
Family income ⟶ Parental drug use ⟶ Child neglect			-.07*
Parental depression ⟶ Child mental health		-.36***	
Parental depression ⟶ Child maltreatment ⟶ Child mental health	-.42***		-.07*

Table 4.6 (continued)

Parental depression ⟶ Physical abusive ⟶ Child mental health			-.05**
Parental depression ⟶ Child neglect ⟶ Child mental health			-.02
Parental Alcohol use ⟶ Child mental health		.01	
Parental alcohol use ⟶ Child maltreatment ⟶ Child mental health	.14**		.12***
Parental alcohol use ⟶ Physical abuse ⟶ Child mental health			.11***
Parental alcohol use ⟶ Child neglect ⟶ Child mental health			.02
Parental Drug use ⟶ Child mental health		-.00	
Parental drug use ⟶ Child maltreatment ⟶ Child mental health	.05		.06*
Parental drug use ⟶ Physical abuse ⟶ Child mental health			.04*
Parental drug use ⟶ Child neglect ⟶ Child mental health			.01

Total N= 1,657; *p < .05, **p < .01, ***p = .001

4.2.5 Summary of research findings from the SEM model

The purpose of this study was to analyze the factors that influence child mental health, with an emphasis on the degree to which family processes mediated the relationship between family income and child mental health for young children involved in the child welfare system. A summary of the main findings in relation to the study questions and hypotheses can be found in Table 4.7. Contrary to the research hypothesis, the current study found that family processes do not mediate the relationship between family income and child mental health; as indicated by the insignificant indirect effects from family income to child mental health. In line with previous research, it was expected that the relationship between family income and child mental health would be weak (Gershoff et al., 2007). However, it was not expected that the relationship would disappear with the addition of other variables in the model. Although one other study found similar results (i.e., the relationship between family income and child mental health disappeared with family processes in the model) (Yeung et al., 2002), failure to establish the proposed mediation is likely due to the weak direct relationship between family income and child mental health.

Rather than mediate the relationship between family income and child mental health, family processes often predicted child mental health outcomes. For example, take parental alcohol use. Parental alcohol use predicted physically abusive and neglectful parenting. However, with all of the variables in the model, the relationship between alcohol and child mental health lost significance. Using the model indirect feature in

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MPLUS, analyses revealed that the relationship between alcohol use and child mental health was fully mediated by physically abusive parenting. A similar pattern was uncovered for parental depression and child mental health through physically abusive parenting (only partial mediation was established). While family income did not show a statistical effect on child mental health, it did increase physically abusive parenting, alcohol use and mental health problems. In the case of physical abuse, the relationship was suppressed until parental depression, alcohol use and drug use were included in the model. This mediation model uncovered an interesting role for family income as a predictor of parental functioning, as well as a suppression effect between family income and physical abuse. Finally, for two of the three measures of parental functioning, physically abusive parenting explained at least some of the variance in child mental health—but not child neglect. Further discussion of the meaning and implications of these results will be discussed in the following chapter.

Table 4.7: A summary of the main findings by research aim

Research Aim	Research questions	Hypotheses	Analyses	Results
Aim 1: To provide a descriptive analysis of child mental health, including variations by family income and family processes	R1: What are the mental health outcomes of young children involved in the child welfare system?	Children in the child welfare system will have a high rate of mental health problems.	Weighted mean/standard error of the mean	Mean scores on the mental health measure were slightly above the national average of 50 ($M = 52.09$) but below the clinical cut-off score of 64. Thus, on average, children in the sample have greater mental health problems, but not at clinically significant levels. Child age, gender and a diagnosed disability were associated with worse mental health, but parental race/ethnicity was not.
	R2: How do child mental health outcomes vary by family income and family processes (measured by parental depression, alcohol use, drug use, and physically abusive and neglectful parenting)?	Greater mental health problems will be experienced by children living in homes with less family income, although this relationship will be weak.	Pearson's R correlation	Low family income-to-needs was associated with greater mental health problems in children. However, the Pearson's R coefficient was weak.
		Children whose parents demonstrate greater parental functioning will be more likely to experience mental health problems.	Pearson's R correlation	Greater parental depressive symptoms and alcohol use were associated with higher child mental health scores. However, drug use was not associated with higher child mental health scores.

Table 4.7: Continued

	R3: What is the association between family income, parental functioning, (parental depression, alcohol use and drug use) and physically abusive and neglectful parenting?	Family income will be associated with both forms of child maltreatment.	Weighted t-tests	Family income was not associated with a higher incidence of physically abusive or neglectful parenting.
		Parental depression problems and drug and alcohol use will be associated with a higher prevalence of physically abusive.	Weighted t-tests	Parental depression and alcohol use were associated with physical abuse but drug use was not.
		Parental depression problems and alcohol and drug use will be associated with a higher prevalence of and neglectful parenting.		Greater parental depressive symptoms, alcohol use and drug use were associated with a higher incidence of neglectful parenting.
Aim 2: To test the mediating effects of family processes on the relationship between family income and child mental health outcomes	R1: Which aspects of family processes mediate the relationship between family income and child mental health outcomes?	The relationship between poverty and child mental health will be mediated by parental depression, alcohol and drug use and physically abusive and neglectful parenting.	Structural equation modeling	Results from the SEM analysis did not support parental depression, alcohol use, drug use, physically abusive parenting and neglectful parenting as mediators between family income and child mental health. Failure to find mediation was likely related to the weak total effect of family income on child mental health.

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Table 4.7 (continued)

| | R2: Is child maltreatment (e.g., physically abusive and neglectful parenting) a mediator between parental functioning and child mental health? | The relationship between parental depression, alcohol use, drug use, and child mental health will be mediated by physically abusive parenting. | | When parental depression and alcohol use were measured as latent factors, both had a significant direct effect on physical abuse. However, the effect of drug use on physical abuse was not significant. In terms of child mental health, only the direct path from the parental depression measure was significant. Examining the indirect effects revealed that physically abusive parenting fully mediated the relationship between alcohol use and child mental health and partially mediated the relationship between parental depression and child mental health. |
| | | Neglectful parenting will mediate the relationship between parental depression, alcohol problems, drug use, and child mental health. | | The direct paths from parental depression, alcohol use and drug use to neglectful parenting were significant. Yet, the indirect effects revealed that neglectful parenting did not mediate the relationship between measures of parental functioning and child mental health. |

CHAPTER 5: DISCUSSION AND CONCLUSIONS

Children involved in the child welfare system are a particularly vulnerable group. In addition to low family income, parental stressors such as parental depression and drug and alcohol use are common risk factors that have been linked to poor parent-child interactions, as well as poor child mental health outcomes. Taking into account contextual parental and child risk factors, this study was guided by the family stress model—a conceptual framework for understanding the mechanisms through which economic hardship impacts child mental health outcomes.

This study yielded five main research findings: (1) the mean score for child mental health, along with the prevalence of parental self-reported mental health problems, alcohol use and drug use were lower than reported in previous studies; (2) child characteristics, such as age, gender and receipt of developmental services were associated with child mental health outcomes; (3) the direct effect of family income on child mental health, as well as the indirect effects through measures of parental functioning (e.g., parental depression, alcohol use and drug use), were not significant; yet a lower income-to-needs ratio was associated with all three measures of parental functioning; (4) family income was directly associated with physical abuse but only indirectly associated with child neglect, through the influence of parental depression, alcohol use and drug use; and (5) child maltreatment mediated the relationship between parental depression, alcohol use, drug use and child mental health—although differences by maltreatment type emerged. In this chapter, I will discuss these main findings and

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place them within the context of the research described in the literature review. Following the discussion of these main findings, I conclude by addressing the study limitations, as well as implications for child welfare practice and policy.

5.1. Discussion of the main findings

5.1.1 Child mental health scores and parental factors were lower than previously reported

A substantial body of literature documents the increased prevalence of mental health disorders among children involved in the child welfare system (Burns et al., 2004; Farmer et al., 2001; Kortenkamp & Ehrl, 2002; Stahmer et al., 2005; Sullivan & van Zyl, 2008). However, the examination of mental health outcomes has largely focused on children in out-of-home care. This study examined the mental health outcomes of young children who remained with their primary caregiver (i.e., were not placed in out-of-home care). Mean child mental health scores were above the national average but below clinical levels. This suggests that children in the sample, *on average*, were at an increased risk for mental health problems, but not to the degree of significant impairment. Although it was expected that children would demonstrate higher mental health problems, these findings were consistent with mean scores found in a recent study of young children involved in the child welfare system (Mustillo et al., 2011).

The low prevalence of clinical problem behavior may be related to the cross-sectional design of the study. In a recent study, Mustillo and colleagues (2011) found similar mean scores for a sample of children who remained in-home. However, their

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findings revealed that the mental health outcomes of preschool and school-aged children, as well as adolescents, worsened over time. This suggests that there may be delayed or lagged effects of maltreatment and other risk factors on children's mental health. The current study used a cross-section of data rather than longitudinal data; as a consequence, the long term effects of economic hardship, parental risk factors and maltreatment on child mental health were not examined.

The low prevalence of mental health problems may also be related to the study sample. Approximately 20% of children scored in the clinical range and another 28% scored in the borderline clinical range. Yet, over 50% of the children in the sample received scores at or around the national mean. Recall, children were only included in the current study if they remained with their caregivers and, at least at Wave 1, were not removed from their home. These inclusion criteria were based on the measures needed to measure family processes. However, children who remain with their parents are often part of more stable family systems and therefore do not represent the most vulnerable children involved in the child welfare system. As such, the low percentage of clinical problem behavior in the sample is likely associated with the inclusion criteria. Another possible reason for the low clinical problem behavior in the sample is that NSCAW data included children who were the subject of a maltreatment report, but may not have been maltreated. In some cases, suspicion of maltreatment was reported but did not occur. This may be more likely in cases where children were not removed from their home. Finally, child age may have contributed to the low percentage of clinical mental health problems

found in the sample. Assessing mental health problems in young children can be difficult—especially with children who are less verbal. Since mental health scores were obtained by a parental assessment of behavior, rather than from a trained professional, the low prevalence of mental health problems may be related to under-identification by parents.

As with child mental health, the prevalence of parental functioning, measured by parental depression, alcohol use and drug use was lower than reported in previous research. Parental depression was measured using six items from the mental health component of the Short-Form Health Survey. The mental health component has been used to screen mental health problems in the general population (Gill et al., 2007). In the current sample, mean depression scores were slightly below the national average, suggesting that parents involved in the child welfare system may demonstrate greater depressive symptoms than do adults in the general population. However, it is important to highlight that the differences were not large. Estimates from the National Institute of Health suggest that roughly 26% of the general population have a diagnosable mental illness; although around 5% of this population is reported to have a severe or debilitating condition (Kessler, Chiu, Demler & Walters, 2005). In the current study, approximately 13% of the sample had clinically significant scores. This prevalence of depression is lower than reported in previous studies with parents involved in the child welfare system (Burns et al., 2004; Mustillo et al., 2011). For example, Burns and colleagues (2004) used the Composite International Diagnostic Interview Short-Form (CIDI-SF) to assess the

likelihood of major depression among parents with child welfare involvement. They found that nearly half of parents met the criteria for major depression during at least one point in a 36 month period following a child welfare investigation. Likewise, Leschied and colleagues (2005) found that around 29% of mothers in a Canadian child welfare sample were diagnosed with a depressive disorder. The low percentage of mental health problems may be associated with the measurement of this construct.

Although the mental health component of the Short Form Health Survey has been used in several national studies to screen depression in the general population, there is little information on the psychometric properties of this measure. In particular, there is limited evidence related to the measure's specificity—that is the degree to which depressive conditions are actually detected when they exist. Previous research examining depression among parents involved in the child welfare system has used the CIDI-SF is a measure of depression (Burns et al., 2004; Mustillo et al., 2011).[11]

One limitation of the CIDI-SF measure is that, because of its nested skip pattern, it does not allow for the examination of individual items. Therefore, conducting exploratory and confirmatory factor analysis to test the underlining latent construct of depression was not possible. As a consequence, the measure of depression can only be included as an observed construct and is therefore vulnerable to measurement bias. This is especially problematic in the study of depression, where the symptoms, rather than the condition, are observed. For this reason, the Short Form Health Survey-Mental Health

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[11] In analysis not shown, around 25% of the sample endorsed the screening criteria for depressive disorders. This is consistent with a recent study by Mustillo and colleagues (2011) that examined parental depression in a similar sample of children and families involved in the child welfare system.

Component was used in this study even though there was limited research on its psychometric properties. Using the CIDI-SF as an observed measure of depression may change the relationships between the independent variables and child mental health, as well as the overall model fit presented in the study. Given the low percentage of parental depression problems detected by the mental health component of the Short Form Health Survey, future research should consider re-examining the paths from poverty to child mental health through parental depression with the CIDI-SF.

Similar to mental health, parental alcohol and drug use affected a very small proportion of the sample. An examination of mean scores for the AUDIT (alcohol) and DAST (drug) measures revealed that few parents reported problematic behavior. The psychometric properties of the AUDIT (Rumpf, Hapke, Meyer, & Ulrich, 2002) and DAST (Coco & Carey, 1998) have been examined using multiple samples and study contexts. These studies have revealed that both the DAST and AUDIT are valid and reliable screening tools for adult substance use. However, despite the high reliability and validity of these measures, some researchers have found that the problem behavior is more difficult to detect in non-clinical populations (Rumpf et al., 2002; Yudko et al., 2007). Since NSCAW-II was the first national study of children and families involved in the child welfare system to include the AUDIT and DAST measures to assess parental substance use, cross-study comparisons using these measures with this population were not possible.

The low prevalence of substance abuse may also be related to the inclusion criteria of the sample. Families in the study were included only if their children were not removed from the home and a clinical level of substance use is often correlated with removal from the home. Thus, families in the sample were likely higher functioning than were families whose children were placed in out-of-home care. For example, an infant born with a positive toxicology screen at the hospital would not likely be in this sample, as they would have probably been removed from parental care. Data from the previous NSCAW-I study estimated substance use in approximately 11% of the population (Burns et al., 2004; Libby et al., 2006), which included parents whose children remained in the home, as well as parents whose children were in out-of-home placement. Among states that reported data on parental drug and alcohol use, the percentage of substance use among non-confirmed cases of maltreatment was 5.7% for alcohol and 8.9% for drug abuse (U.S. Department of Health and Human Services, 2011). The percentage of alcohol and drug problem behavior (around 4% for alcohol and 4% for drug use) reported in the current sample is closer to state estimates.

Empirical research, especially in the area of child welfare, has largely examined drug and alcohol use as a single variable. Research by Kelleher and colleagues (1994) provided strong evidence in support of examining these constructs differently. This is especially true within the context of child maltreatment, as research suggests that the effects of drug and alcohol abuse differ by maltreatment type (Famularo, 1994; Kelleher et al., 1994). The current study provided a more refined view of substance abuse by

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measuring drug and alcohol use as independent constructs. However, it is worth noting that scores for drug and alcohol use were obtained through parental self-report. Therefore, their prevalence may be underestimated. This is a strong possibility in the current sample where admittance of problematic behavior could affect the outcome of a child welfare investigation; for example, if a parent admitted to heavy drug use to the caseworker, it may influence the caseworker's decision to remove the child from the home.

Finally, parental reports of physically abusive and neglectful parenting in the current study were similar to previous research; although slightly lower than what was reported by Mustillo and colleagues (2011). The bivariate association between physically abusive and neglectful parenting and child mental health were positive—indicating maltreatment contributed to higher child mental health problems. However, multivariate results highlighted the role of physical abuse rather than neglect.

5.1.2 Child characteristics were associated with mental health outcomes

Although child characteristics in the current study were included as control variables, it is worth noting that all three measures: age, gender and receipt of developmental services were associated with child mental health outcomes. As hypothesized, male children demonstrated greater mental health problems. This is consistent with developmental perspectives that suggest possible gender differences in the onset of psychopathology (Zahn-Waxler et al., 2008). Similar to gender, findings on child age were consistent with previous research. Older children were more likely to

receive higher scores (indicating worse mental health) on the CBCL (Mustillo et al., 2011). A higher prevalence of mental health problems among older children may be related to under-diagnosis in young children—as it can be difficult to detect mental health problems with children who are less verbal. Additionally, older children, especially as they approach adolescence, go through identify formation (Robbins, Chatterjee, & Canda, 2006). Many of the challenges during this stage (e.g., independence) can be perceived as problematic behavior, especially to parents who are unfamiliar with the stages of normal child development.

Finally, receipt of early intervention services, which was used as a proxy for child disability, was positively associated with child mental health. Children who received early intervention services for a diagnosed disability were found to have greater mental health problems. This was consistent with previous research showing that children involved in the child welfare system often have multiple challenges in the area of development (Barth et al., 2008; Casanueva et al., 2008; Helton, 2011).

5.1.3 Income-to-needs and child mental health: Do measures of parental functioning mediate?

More than half of the families in the sample had an income-to-needs ratio below 1, indicating that they lived below the federal poverty threshold. This was higher than reported in previous research using data from the first NSCAW study (Helton, 2011; Mustillo et al., 2011). It is possible that higher need was a result of a history effect, given that the data were collected in 2008 at the start of the economic recession. The primary

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relationship of interest was the direct effects of family income on child mental health. This bivariate relationship was significant, indicating lower family income was associated with greater child mental health problems. This finding was consistent with the literature on the family stress model (Conger et al., 1994; Gershoff et al., 2007; Mistry et al., 2004; Yeung et al., 2002). Despite establishing a bivariate association between family income and child mental health, the direct and indirect effects tested in the model were not significant.

The relationship between family income and child mental health was proposed to be weak, but we found no relationship between these variables in the study. Yet, findings from the current study are consistent with research by Yeung and colleagues (2002). They found that family process mediators explained more of the variance in child behavioral problems than did income—such that when family processes were added to the model, the direct effect of family income on child behavioral problems became insignificant (Yeung et al, 2002). Failure to establish parental depression, alcohol use and drug use as mediators between family income and child mental health in the current study was likely related to the weak direct relationship. As will be discussed, this weak direct effect may be the consequence of unmeasured variable bias.

Researchers have struggled to identify which measures of economic hardship accurately capture the stress associated with low incomes. Gershoff and colleagues (2007) argued that a simple income measure does not provide an understanding of how economic hardship matters for children. Rather, a combination of income variables with

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measures of material hardship (Gershoff et al., 2007) and financial stress (Mistry et al., 2004) provided a greater understanding of how economic hardship translated to poor child outcomes. In the absence of an economic hardship measure, the current study used an income-to-needs variable. Recall, that the income-to-needs variable was constructed using family income, household size and the poverty threshold of 2008. The threshold varies according to the number of people living in the household and is based on monetary estimates that project minimal standards for food and living expenses (Bishaw & Iceland, 2003). While this measure incorporates greater information about family economic hardship compared with the standard income measure, it is not without criticism.

Some researchers argue that the poverty threshold does not capture the stress associated with being low income. This is because the poverty threshold, published by the U.S. Census Bureau, does not integrate the most current housing, child care and medical costs (Gershoff et al., 2007). Likewise, researchers using the poverty threshold to create an income-to-needs variable have found that it has a nonlinear effect on family processes and child outcomes; such that the effects of income on child mental health through family processes were significant only for poor children (Mistry et al., 2004). Future research with this population calls for the inclusion of more refined measures of economic well-being. Ideally, multivariate models should include multiple measures of economic hardship, such as material hardship and objective measures of perceived economic stress. Failure to include several measures of family economic hardship may

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have contributed to the underestimation of its effects on family processes and child mental health.

Despite the limitations related to the measure of economic hardship discussed above, the family income-to-needs ratio did have a significant effect on all three measures of parental functioning (i.e., parental depression, alcohol use and drug use). The results revealed an interesting pattern. Lower family income predicted greater parental depressive symptoms, as well as greater drug and alcohol use. However, of the parental functioning variables, only parental depression had a direct path to child mental health. The direct link between parental and child mental health has been established for children in the child welfare system (Burns et al., 2004; Mustillo et al., 2011). However, this is one of the first studies to examine measures of drug and alcohol abuse separately as direct and mediating paths to child mental health. These two factors are particularly important in the context of the child welfare system—as parental drug and alcohol use are highly correlated with both physical abuse and neglect.

5.1.4 Family income and child maltreatment: Do measures of parental functioning mediate?

Findings from the current study do not reveal a clear pattern in terms of the relationship between family income and child maltreatment—both in the case of physical abuse and neglect. First, starting with the relationship between family income and neglect, neither the bivariate or SEM analyses revealed a statistically significant association. Lower family income was not a significant predictor of neglectful parenting.

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Although this was contrary to the research hypothesis, previous research has uncovered considerable variation in which predictors of economic hardship are related to child neglect. Slack and colleagues (2004) found that perceived material hardship was associated with child neglect, but family income and welfare receipt were not. Similarly, Carter and Myers (2007) found that economic factors were not directly associated with child neglect once family risks, such as depression and substance use, were included in the analysis. A limitation with these studies is that they do not consider the relationship between family income and child outcomes as distal—meaning that it is indirect through more proximal factors, such as parental depression and substance abuse.

The relationship between family income-to-needs and physical abuse is more complex. Recall that the bivariate relationship was not significant. However, with parental depression, alcohol use and drug use variables in the SEM model, the direct effects of family income-to-needs on physically abusive parenting were significant. This suggests that the effects of family income on physically abusive parenting were suppressed until parental functioning variables (i.e., parental depression, alcohol use and drug use) were included in the model. Family income, therefore, acted as a catalyst for physical abuse only in the presence of parental depression, alcohol use and drug use. This finding presents a different perspective on the role of family income in child maltreatment, especially given previous research.

There is a substantial body of literature documenting the association between physical abuse, with spanking in particular, and poverty. After controlling for risk factors

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such as parental substance use and low birthweight, Berger (2004) found that the relationship between low income and spanking was reduced to non-significance. Similarly, Paxson and Waldfogel (2002, 2003) found that income was associated with physical abuse among children in single-parent families but not for children in two-parent households. Despite evidence that there may be confounding factors that influence the strength of association between income and physical abuse, the direction of the relationship has been largely consistent, with a few exceptions.

Using an income-to-needs ratio, Gershoff and colleagues (2007) found that the relationship between income and physical abuse was positive, such that greater income was associated with a higher incidence of physical abuse. However, the direction of this coefficient was positive only when parenting stress variables were included in the model. Like in the study by Gershoff and colleagues (2007), the relationship between the income-to-needs ratio and physical abuse in this study was positive with family process measures included in the model. While the total effects of family income, parental depression, alcohol use and drug use on physical abuse and neglect were not statistically significant, the indirect effects of family income on physical abuse and neglect through measures of parental functioning were statistically significant. Using criteria for mediation by Baron and Kenny (1996), this finding would not support mediation since the total effects were not significant. However, in a seminal article by Shrout and Bolger (2002), different criteria for mediation were argued. In particular, they addressed

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statistical reasons for the change in direction of a primary relationship when mediator variables are introduced.

Shrout and Bolger (2002) suggested that mediation without a direct or total effect may occur in two circumstances. If the primary effect is not significant and achieves significance or the sign of the relationship changes directions, this may be evidence of a suppression effect—which in the current study arose when parental functioning variables were included in the model. The second possibility is related to the proximal and distal relationships of variables. When the relationship between X (income-to-needs) and Y (physical abuse) is more distal than the relationship between the mediators (parental depression, drug and alcohol use) and the dependent variable, the effect size of the primary relationship will be smaller than the effects of Z (the mediators) on Y. In this case, the indirect effects may be significant even when the total effects are not. If either of these scenarios are true, Shrout and Bolger (2002) indicate that the first step of mediation (establishing a total/direct effect) proposed by Barron and Kenny (1986) can be bypassed. To this effect, the relationship between X (family income) and Y (physical abuse) exists only in the presence of Z (parental depression, drug use and alcohol use).

As mentioned above, the indirect effects of income-to-needs on physical abuse and neglect through parental depression, alcohol use and drug use were statically significant. If the criteria for mediation by Shrout and Bolger (2002) were applied, this would suggest low family income increased the likelihood of physical abuse and neglect only when parental depression and substance use were present. This interpretation is in

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line with research on the family stress model and is consistent with the study by Gershoff and colleagues (2007). This finding has implications for policy, as it could influence how we understand the etiology of child maltreatment. That is, if family income is associated with child maltreatment only through its effects on parental functioning, services that decrease parental depression and exposure to substance use will likely attenuate the effects of low income on parenting (in particular, physical abuse) and child mental health.

5.1.5. Parental functioning and child mental health: Physical abuse stands out

The impact of parental functioning variables (parental depression, alcohol use and drug use) on child mental health varied, as did the parenting mechanisms that translated these risk factors to poor child mental health. Although the studies are dated (Chaffin et al., 1996; Kelleher et al., 1994), previous research using community data found that the risk factors for physical abuse and neglect were distinct and, in fact, had very little overlap. Findings from the current study with children involved in the child welfare system are consistent with previous research using community data. The results showed that the direct path from parental depression to child mental health was significant but the paths from drug and alcohol use to child mental health were not. Similarly, the direct paths from parental depression, alcohol use and drug use to neglectful parenting were significant; however, only the direct paths from parental depression and alcohol use to physically abusive parenting were significant. The differences between how physical abuse and neglect translate parental functioning measures to poor child mental health is a

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significant finding in the current study. This section will discuss these differences and place them within the context of previous research.

The relationship between child and parental depression was partially explained by the negative influence of parental mental illness on parenting, such that parents who reported greater depressive symptoms were more likely to have reported physically abusive and neglectful parenting. This finding is in line with previous research documenting the strong association between parental depression and hostile discipline and disengaged parenting for children in the general population (Chaffin et al., 1996; Conger et al., 1994; Conger et al., 1995; Du Rocher Schudlich & Cummings, 2007; Lovejoy et al., 2000; Lyons-Ruth et al., 2002). One study examining the indirect effects of physical abuse and neglect on the relationship between parental depression and child mental health among children in the child welfare system found a different pattern in the relationship between variables. Mustillo and colleagues (2011), using a sample of young children in the child welfare system, failed to establish physically abusive parenting as a mediator between parental depression and child mental health. Findings from the current study are contradictory to those found by Mustillo and colleagues (2011). The inconsistent findings between the two studies may be related to differences in measurement and study design.

There is a large body of research documenting the relationship between parental substance abuse and physical abuse (Berger, 2005; Chaffin et al., 1996; Kelleher et al., 1994; Walsh et al., 2003). Few studies using child welfare samples have examined

multiple parental risk factors, such as depression, alcohol use and drug use—although research using community samples have found that these factors are robust and explain a high incidence of physical abuse. Chaffin and colleagues (1996) found that depression, above all other psychiatric disorders (including substance abuse), was more strongly associated with physical abuse—although both depression and substance abuse were important predictors of physical abuse. One limitation in that study is that substance use was collapsed into a single variable. Therefore, they were unable to identify if alcohol and drug use have a differential effect on the likelihood of physical abuse.

In 1994, Kelleher and colleagues wrote that "poorly specified or inconsistent definitions of substance use…have left many unanswered questions about the strength and nature of the relationship between alcohol and drug disorders and child maltreatment" (p. 1586). In their research, they found differences in the relationship between alcohol use, drug use and physical abuse. The findings above were replicated in research by Berger (2005), where alcohol, rather than drug use, was a stronger predictor of physical abuse. Consistent with these findings, the current study found that alcohol abuse was more strongly related to physical abuse, followed by parental depression and drug use. While these studies observed distinct differences in the strength of the relationship between alcohol and drug use and physical abuse, how parental substance use and physical abuse translate to poor child mental health was not examined.

The current study observed distinct differences in how alcohol and drug use related to physical abuse and child mental health. The relationship between parental

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alcohol use and child mental health was fully explained through the indirect influence of physical abuse. In other words, parental alcohol use was associated with greater child mental health problems only when it contributed to physically abusive parenting. Although most research on the family stress model has examined the effects of parental depression on child mental health through the indirect effects of parenting, this study expanded the conceptualization of parental functioning to include alcohol and drug use. Expanding the study to include both substance abuse measures is important in the context of the child welfare system, where alcohol and drug use are associated with poor child welfare, as well as poor child mental health outcomes.

It was expected that parental drug use would increase child mental health problems directly, as well as through its influence on physically abusive parenting. However, the research findings did not support this hypothesis. While there is some evidence that drug use may have a lesser influence on physical abuse than does alcohol use (Berger, 2005; Famularo et al., 1992; Kelleher et al., 1994), there is also substantial literature demonstrating its statistical and clinical association (Dore et al., 1995; Smith et al., 2007; Walsh et al., 2003). Failure to establish this relationship may be related to the measure of drug use and/or social desirability biases of respondents. The prevalence of drug use in the current sample was very low. While the DAST is a validated psychometric tool for assessing drug use, there is some evidence that social desirability biases of respondents underestimate drug use in non-clinical populations (Coco & Carey, 1998). This is likely in the current context, where self-incrimination may influence the

outcome of the child welfare investigation. Therefore, social desirability bias, as well as the consequences associated with admitting use, may partly explain why drug use was not associated with physical abuse or child mental health.

All three measures of parental functioning were associated with an increased likelihood of neglectful parenting. This finding was consistent with the child welfare literature documenting the relationship between parental depression, alcohol use, drug use and child neglect (Hildyard & Wolfe, 2002). However, contrary to the research hypothesis, neglectful parenting was not associated with increased child mental health problems nor did it explain (at least statistically) the relationship between parental functioning measures and child mental health. As such, findings from the current study do not help clarify the role of neglectful parenting as a predictor of child mental health or as a vehicle through which child mental health was influenced. One way researchers could expand this finding is by retesting whether this pattern exists for internalizing and externalizing subscales of the CBCL measure. There is some evidence to suggest that the effects of child maltreatment on child developmental domains are different for child neglect and physical abuse. In particular, previous research has found that neglect increases the likelihood of internalizing symptoms in children (Dore et al., 1995).

Only one study examined neglectful parenting as a predictor, and mediator, of child mental health among children involved in the child welfare system. Using data from the first NSCAW study, Mustillo and colleagues (2011) found that neglectful parenting partially mediated the effects of parental depression on child mental health for young

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children in the child welfare system (Mustillo et al., 2011). There are several possible explanations for the differences found between the current study and that conducted by Mustillo and colleagues (2011)—most of which are related to the inclusion of different assessment scales, as well as the possibility of measurement error. In SEM, the estimation of regression paths is sensitive to measurement bias and error (Kline, 2005). A lack of specificity in the assessment of parental depression may have caused an underestimation of the effects on child mental health, as well as on the estimation of the indirect effects through child neglect. This is a likely consideration given the low level of parental depression found in the current sample.

Another limitation related to measurement is with the neglect subscale of the Parent-Child Conflict Tactics Scale. Despite high internal consistency scores in the current sample (α=.91), there is evidence from the general population indicating that the reliability of this subscale is very low (Straus et al., 1998). Given the low reliability of the measure when used in the general population, the developers of the scale recommend that the subscales be dichotomized. While dichotomizing the scale, as was done in the previous study, was consistent with how other researchers have addressed this issue (Mustillo et al., 2011), it is important to note that dichotomizing the scale did not allow for an understanding of the severity and intensity of the neglectful parenting (Mustillo et al., 2011). Despite the limitations associated with this measure, it remains the only parental self-report measure of child neglect in the NSCAW data.

5.2. Methodological limitations

Although several limitations related to the measurement of economic hardship and family processes have been mentioned, there are other limitations that are worth noting. Perhaps, the greatest limitation is related to the study design. This study used secondary data from a cross-section of children and families involved in the child welfare system. The data were retrospective and did not include information on the sequencing of conditions; such that, it is not clear whether drug and alcohol use occurred prior to, during, or after incidences of child maltreatment. Another related limitation is that in SEM causality is implied in the direction of the arrows even when the data do not permit the sequencing of events. For example, although arrows were drawn from physical abuse and neglect to child mental health, it is quite possible that children with greater needs were more likely to be physically abused and/or neglected. Indeed, research suggests that parenting is bidirectional (Jones Harden & Klein, 2011). Children with difficult temperaments and multiple needs may overwhelm parents, which can negatively affect parent-child interactions (Belsky, 1984). Although testing these set of relationships as bidirectional would have been ideal, specifying nonrecursive models in SEM using cross-sectional data is not recommended (Kline, 2005). Therefore, failure to specify these relationships as bidirectional may have contributed to specification error.

Data used in the current study required weighting procedures in order to properly estimate the standard errors. Although previous research suggested that family processes may differ by race and ethnicity (Pacher, Auinger, Palmer & Weitzman, 2006), a study

by Mistry and colleagues (2002) found model invariance. Originally, the current study's data analysis plan included multiple group analyses to test this hypothesis. However, due to the complexity of the data and the proposed model, convergence problems were encountered with multiple group analyses. As such, testing racial and ethnic differences was not possible. Along these same lines, a path including "no abuse" from parental functioning variables to child mental health was considered. Yet, due to linear dependency—which occurs when the categories of groups are not independent of one another—adding this path prohibited model convergence. Therefore, the current study did not test whether the paths from parental mental health, alcohol use and drug use to child mental health could also be mediated by non-abusive parenting. This would certainly be a great limitation with data from a community sample; however given that these children are involved in the child welfare system, the percentage of children in the sample who have had no experience with physical abuse or neglect is likely low.

SEM is an analytical tool used to test theoretical relationships. While the directions of the relationships in the model were driven by theory, the measures selected to represent the constructs affect both the significance of the relationships and the overall model fit. It is plausible that other measures, not included in the study, would more accurately represent the relationships posited in the model. It is likely, given the low individual R^2 values of key variables that other measures would produce different model fit results. In particular, the inclusion of a different economic hardship, maltreatment and parental functioning measures may have yielded a more precise understanding of the

effects of family income on measures of parental functioning, child maltreatment and child mental health. This is one of the greatest challenges and criticisms of SEM as an analytic procedure.

Finally, the family stress model is a risk model that focuses on relationships between contextual and parental factors. While the purpose of this study was to examine these risks, there is strong evidence to suggest children involved in the child welfare system are resilient—in fact, there is entire body of literature examining risk and protective factors associated with this population (Fraser, 2004). Understanding how risk and protective factors work is an important piece to understanding why some children succeed despite exposure to significant adversity. Along these same lines, issues of selection are at hand. Many factors, such as race, ethnicity and social class influence who comes to the attention of the child welfare system. Therefore, children and families in this sample are not representative of the general population or of children who have experienced maltreatment.

Although these are national data, and are representative of children and families involved in the child welfare system, the results from the current study cannot be generalized to all families with young children in the system. This sample is representative of children who remain in-home. The associations between constructs discussed in the study are statistical and theoretical. They do not take the place of clinical, "real-world" significance. Rather, the premise of this study was to apply an analytical framework to the study of how distal and proximal factors influence child

maltreatment and child developmental outcomes, with a specific focus on family income, family processes and child mental health.

5.3. Main study contributions

In 2011, Jones Harden and Klein wrote in a special edition in *Children and Youth Services Review* (Volume 33) that there is a limited understanding of the "unique child welfare ecologies at different stages of development" (p. 1466). They emphasized that research in this area is needed to refine child welfare services to more accurately address the developmental consequences of child maltreatment. Furthermore, they stated that greater knowledge about how family processes affect child welfare outcomes is necessary in order to promote child and family well-being (Jones Harden & Klein, 2011). This study contributed to these goals in two ways.

First, this study examined the family stress model within the context of the child welfare system. Although many of the risk factors postulated in the family stress model are highly correlated with child welfare involvement, this is the first study to test its application with a child welfare sample. Furthermore, this study expanded on the family stress model by broadening definitions of parental functioning to include other behavioral health measures, such as alcohol and drug use. This is relevant to child welfare practice, as 85% of child welfare administrators in 2001 indicated that substance abuse was one of two critical factors faced by families involved in the child welfare system (Peddle & Wang, 2001). Furthermore, risk models, such as the family stress model, in the context of

a child welfare population can help identify the most vulnerable families, which is necessary during periods of economic recession when services to families are scarce.

Second, this study examined the mechanisms by which contextual (economic hardship) and parental (parental functioning and parenting behaviors) risk factors increase mental health problems among young children involved in the child welfare system. This specifically addressed the need for research to address the "unique child welfare ecologies" (Jones & Klein, 2011, p. 1466) and their impact on developmental outcomes in children. Few studies, especially in the child welfare literature, have examined the mechanisms that contribute to poor child mental health. In particular, there is little attention on how social context works indirectly through more proximal relationships, such as parental well-being and parenting. Furthermore, despite consensus about the adverse short- and long-term consequences of maltreatment on child mental health, most research on the mental health outcomes of children has focused on children in out-of-home care. For children who remain at home with their primary caregiver, continued exposure to these risk factors can lead to chronic maltreatment and mental illness.

Along these same lines, this study examined parental depression, alcohol use and drug use and their impact on child mental health through physically abusive and neglectful parenting. Despite evidence suggesting that substance use has a negative impact on parenting behavior, "the mechanisms for this association remain unclear" (Walsh et al., 2003, p. 149). Methodological challenges in defining and measuring

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parental substance abuse have left several unanswered questions. Previous research has collapsed substance use into a single variable or has examined the effects of drug and alcohol separately but did not distinguish by maltreatment type. The current study provided some insight as to the differential impact of alcohol and drug use on both parenting and child mental health outcomes; thus expanding our knowledge about the relationship between family ecology and developmental outcomes among children involved in the child welfare system.

5.4 Implications for child welfare research, practice and policy

In this section, I discuss implications for child welfare research, practice and policy as they relate to three major areas: child mental health, poverty and substance abuse. These topic areas highlight the major findings and contributions of the current study. It is critical that the implications discussed here be further tested by future research—primarily through the use of longitudinal and experimental designs.

5.4.1 Child mental health: Research, practice and policy needs

At Wave 1, more than half the sample had mean mental health scores around or below the national average. Yet, previous research shows that mental health scores in preschool and school-aged children who were the subject of a maltreatment report, but who remain with their caregiver, worsen over time (Mustillo et al., 2011). This is especially true in the context of other risk factors such as parental depression, substance use, and impaired parenting. According the National Institute of Mental Health (2012), the early screening and treatment of children, prior to the onset of severe mental illness,

is optimal for prognosis. Using community data, Kessler and colleagues (2005) found that 50% of individuals with mood and anxiety disorders reported the onset of their illness before age 14. Results from the current study suggest that the first 18 months following a maltreatment investigation may be a critical time for mental health treatment and intervention of young children. In particular, attention should be placed on children who received scores in the borderline clinical range, which in this study, was roughly 30% of children in the sample.

Given these results, there are several implications for the child welfare system. As part of Title IV-B of the Social Security Act, states are required to participate in Child and Family Service Reviews (CFSRs), a federal monitoring system for state child welfare agencies. States are evaluated on three outcomes: child safety, permanency, and family and child well-being. One of the main indicators of child well-being is mental and behavioral health (U.S. Department of Health and Human Services, 2012), which is the context of the current study. States are evaluated in their efforts to address the mental and behavioral health of children through initial and on-going assessments and treatment. In a review of CFSRs conducted by the Children's Bureau from October, 2000 to March, 2004, only four states received a strong rating for their approach to assessing and treating the mental health needs of children (U.S. Department of Health and Human Services, 2012). Even with the external pressure of the federal government, states are failing to meet the mental health needs of children. State child welfare systems indicated that developing appropriate screening and assessment instruments, as well as training staff,

clinicians, and foster care parents to address these needs are the main challenges to meeting the needs of these children (U.S. Department of Health and Human Services, 2012).

One limitation to using the CFSRs as a gauge of child welfare outcomes, particularly child mental health, is that they are only mandated to follow children who receive services or are in out-of-home care. In terms of behavioral health, children who remain in-home are applicable for the CFSR assessment only if: (1) these issues are relevant to the reason for the agency's involvement with the family; and/or (2) it is reasonable to expect that the agency would address mental/behavioral health issues given the circumstances of the case. Since research suggests that children who remain in-home are less likely to receive mental health services (Leslie et al., 2004), the mental health outcomes of children in-home may not be routinely evaluated.

Results from this study suggest that focusing on the mental health needs of children who remain in-home is also important—especially when coupled with chronic exposure to low family income, parental depression and substance use, and impaired parenting. The Center for Excellence in Children's Mental Health (2011) suggests one way to improve the mental health outcomes of children involved in the child welfare system is to use trauma-related screening and assessment tools. Research testing the validity and sensitivity of mental health assessment tools, as well as their usefulness in the field, would help ensure that children with mental health problems were properly identified. Improving the validity of our estimates would help advocacy groups argue for

the mental health assessment of all children who enter the child welfare system as well as for their involvement in the CFSR state evaluations. Expanding the focus of CFSRs to emphasize all children who remain in-home may be one way of ensuring that children who have mental health problems receive services before the onset of significant mental illness.

5.4.2 Family economic hardship: Where do we go from here?

Although family income did not have a strong effect on child mental health, it did have an effect on family processes, and in particular, parental depression, alcohol and drug —all of which were associated with child maltreatment. Data used in the study were collected in 2008, at the beginning of the economic recession. The percentage of children in the sample living in households below the poverty line is far higher than previously reported—with over 60% below the relative poverty line. Understanding how family economic hardship affects child development for maltreated children will be important in order to improve child well-being outcomes for this population. Moreover, despite the large body of literature documenting the association between economic hardship and child maltreatment, the relationship between these constructs is not causal (Berger, 2005; Crittenden, 1999). This means that we still do not fully understand the mechanisms through which economic measures influence child maltreatment. In part, the method used to measure economic hardship in the current study may not have accurately captured the stress associated with being low income.

In NSCAW-II only questions about income and welfare receipt were asked. This was problematic in the current study, where more than half of the sample was below the federal poverty line. In order to better understand how poverty influences family processes and child mental health, researchers should consider refining how poverty is measured. Indeed, we know very little about the construct validity of many of the traditional poverty measures. Gershoff and colleagues (2007) argued that family income is confounded with other aspects of economic hardship, such as material hardship and perceived economic stress. They argue that less observed aspects of economic well-being are more related to poor parent and child outcomes. Yet, few population surveys have incorporated more complex measures of economic hardship—such that, in the current study, an evaluation of the unobserved characteristics of this construct was not possible.

From the perspective of practice, perhaps the most striking finding was the weak association between family income and child mental health. While children lived in very disadvantaged households, in the absence of other risk factors, they were fairly resilient. Although measures of social support were not included in the model, this finding could be further explored by looking at how social and concrete supports help buffer (or moderate) the effects of economic hardship on parental depression and substance abuse— both of which were strongly associated with child maltreatment and poor child mental health. In the context of the child welfare system, this research would have direct implications for increasing family support as a way to decrease child maltreatment and improve developmental outcomes.

5.4.3 Alcohol and drug use: The need for differentiation in the study of maltreatment

In 2001, 85% of child welfare administrators indicted that substance abuse was one of two critical factors faced by families involved in the child welfare system (Peddle & Wang); and in 2004, the National Center for Substance Abuse reported a marked increase in the number of abused and neglected children affected by parental substance abuse problems. Yet, despite the strong association between parental substance use and child maltreatment, states are not required to collect information on alcohol and drug use (U.S. Department of Health and Human Services, 2011). Likewise, in the NSCAW study parental self-report measures of alcohol and drug use were only asked for children living with the biological parent or primary caregiver. Therefore, information about substance use in the foster home was not available.

Children removed from their home may be protected against parental substance use. However, children who remain with their primary caregiver face chronic exposure. These risk factors, especially in the presence of other co-occurring disorders, may heighten the risk for chronic maltreatment; a condition linked to debilitating developmental outcomes and removal from the home. Given the relationship between alcohol and drug use, physical abuse and child mental health, improvements on substance use reporting is needed.

The infrastructure for collecting and reporting substance abuse information is in place through the Adoption and Foster Care Analysis and Reporting System (AFCARS) and the National Child Abuse and Neglect Data System (NCANDS). A federal mandate

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requiring state agencies to collect information on parental substance use would enhance the likelihood that the information is collected. To implement this mandate, case workers would need to be trained in the administration of these assessment tools. Furthermore, standardizing how alcohol and drug abuse is measured would be helpful in understanding their impact on child maltreatment. While including these measures in NSCAW-II was a first step, collecting the data from all child welfare agencies is critical.

Finally, this study provides preliminary evidence on the differential effects of alcohol and drug use on child maltreatment type, as well as on child mental health. Indeed, physical abuse was a critical vehicle translating the effects of alcohol and drug use to poor child mental health; whereas the effects of neglect were not clearly understood. For these reasons, researchers should take caution in collapsing measures of alcohol and drug use into a single measure; as the effects of both child maltreatment type and child mental health varied for alcohol and drug use. In particular, the impact of parental alcohol use in the home should not be minimized—as its effect on physical abuse may be stronger than previous research has suggested. Given that alcohol abuse occurs more frequently in the home than drug abuse (Substance Abuse and Mental Health Services Administration, 2011), practitioners should avoid making generalizations about substance use based on drug use alone. The inclusion of screening tools may help practitioners capture the severity of parental substance use rather than having to rely on observation, parental self-disclosure, and third-party corroboration.

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APPENDIX: An SEM model with formative indicators

The purpose of aim 2 was to test the mediating effects of family processes on the relationship between family income and child mental health outcomes among a sample of young children involved in the child welfare system. The results from an SEM model with reflective factors are presented in Chapter 4. This section will present the results from an SEM model with formative factors. In this model, dichotomous variables for clinical problem behavior in terms of parental depression, alcohol use and drug use were included as causal factors of parental functioning. Table A.1 shows the variables used in the model. While this section interpreted the results of the SEM model with formative factors, the indirect effects were not considered since the poor model fit criteria suggest little confidence in the validity of this model.

Table A.1: Measures used in the SEM model with formative factors

Variable	Description of measure	Source	Variable measurement	Reference
Main Dependent variable:				
Child mental health (1.5-11 years)	The Child Behavioral Checklist (CBCL) standardizes descriptions of problem behaviors and competencies. For 1.5-5 years old, the measure is composed of seven syndromes and for children 6-18 it is composed of eight syndromes. High scores indicated greater mental health problems.	Caregiver	Continuous variable	Achenbach, 1991
Primary Independent Variables:				
Economic hardship:				

Income-to-needs	The income to needs is a ratio derived from three sources: family income, household size, and the United States Census Bureau poverty threshold in 2008—the year this wave of NSCAW II was collected.	Caregiver	Continuous, Ratio	Poverty threshold collected from 2008, United States Census Bureau
Parental functioning: A latent factor was created using scores from the SF- Health Survey, AUDIT, and DAST-20				
Parental depression problems	Six items from the short form health survey were used to measure mental health. A standardized score of 50 with a standard deviation of 10 is within the normal range, with higher scores representing better mental health. A dichotomous measure was created. Scores that fell 1.5 standard deviations below the mean were coded as 1= mental health problems.	Caregiver-ACASI system	Dichotomous variable	Ware, Kosinski, & Keller, 1996
parental alcohol misuse	The AUDIT measures alcohol problem behavior, abuse and dependence. Scores that range from eight to 15 indicate medium level of alcohol problems, while scores 16 and greater represent a high level. This measure is new to NSCAW II. Scores of eight and above were coded as alcohol dependence.	Caregiver-ACASI system	Dichotomous variable	Developed by the World Health Organization
parental drug abuse	The DAST-20 measures drug use. The diagnostic scale consists of 20 yes and no questions. A score of 0 suggests no evidence of drug related problems and a score of six and above suggests abuse/dependence. Score of six and above were coded as parental drug use.	Caregiver-ACASI system	Dichotomous	Skinner, 1982

Physically abusive and neglectful parenting				
Child neglect	A supplemental scale that measures neglect was added to the part of the Parent-Child Conflict Tactics Scale (CTS-PC). Parents who engaged in neglectful behaviors at least one time were categorized as, 1=yes, neglect present and parents who answered no to the items were categorized, 0=no neglect.	Caregiver-ACASI system	Dichotomous variable	Straus, 1990; Straus, et al.,1998;
Child physical abuse	The CTS-PC measures three subscales: non-violent discipline, psychological aggression and physical assault. The variable that will be used is derived from NSCAW. If the caregiver answered yes to ANY of the items of the three scales, they will be coded as 1=physically abusive parenting. If they did not answer yes to the items, they will be coded as 0= no physically abusive parenting	Caregiver-ACASI system	Dichotomous variable	Straus, et al., 1998
Control Variables				
Child age	Constructed by NSCAW. It is a continuous variable in months	Derived from caseworker and caregiver	Continuous in months	NSCAW II (NDCAN 2010)
Child gender	Constructed by NSCAW. It is a dichotomous variable.	Derived from caseworker and caregiver	Dichotomous variable	NSCAW II (NDCAN 2010)
Receipt of developmental services	Derived from two questions. For children under three, caregivers and caseworkers were asked if the child received an IFSP. For children over three years old, the caregiver and caseworker were asked if the child received an IEP. A single variable was constructed if either the caseworker or caregiver indicated the child had received an IEP or an IFSP. 1=yes received developmental services, 0=no developmental services.	Derived from caseworker and caregiver	Dichotomous variable	Casanueva, et al., 2008

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Parental race/ethnicity	Four dummy variables were derived: 1=white, 0=nonwhite; 1=non-Hispanic black, 0= not non-Hispanic black; 1= Hispanic, 0= not Hispanic; and 1=other, 0=not in the other group.	Derived from caseworker and caregiver	Dichotomous variable	NSCAW II (NDCAN, 2010)

A1: Bivariate analysis

To answer the first research question from Aim 1(What are the mental health outcomes of children with child welfare involvement?), a weighted mean was computed. Weighted mean scores in the sample were slightly above the national average of 50 ($M =$ 52.09, $SE = .48$) but below the clinical cut-off score of 64. Indeed, less than a quarter of the children (21%) in the sample scored in the clinical range for problem behavior. Key child demographic variables were associated with child mental health.

A.1.1 Child mental health, family income, and family processes

To answer the second research question (How do child mental health outcomes vary by family income and family processes?), weighted t-tests and Pearson's R correlations were conducted with demographic and independent variables by child mental health. The Pearson's R coefficient for family income and child mental health was negative ($r = -.07$, $p < .01$), indicating that children in households with greater economic needs were more likely to receive poorer mental health scores.

Table A.2 demonstrates sample means and standard errors for child mental health by family processes. The standard error rather than the standard deviation was presented. The standard error represents the confidence of the estimate in the mean, while weighted

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standard deviations are a representation of the entire population. Parental depression (t=7.80, p = <0.001) and drug abuse (t=3.59, p = <0.001) were significantly associated with higher child mental health scores. Children whose parents reported greater depressive symptoms and drug use received higher scores on the CBCL. Likewise, physically abusive (t=5.76, p = <0.001) and neglectful parenting (t = 4.29, p = <0.001) were positively associated with child mental health outcomes, such that poor child mental health was more prevalent among children whose parents reported engaging in child maltreatment. Contrary to the research hypothesis, parental alcohol misuse was not associated with child CBCL scores (t=1.09, p = .27).

Table A2: Weighed t-tests with child mental health and key variables in the study

Variables	Weighted means for child mental health (SE) (N=1,667)	Weighted t-tests with child mental health
Child mental health	52.09 (0.48)	NA
Demographic variables:		
Gender		-3.49**
male	53.58 (0.69)	
female	50.21 (0.63)	
Developmental services		7.63***
received developmental services	50.67 (0.51)	
Parental race/ethnicity		
non-Hispanic white	53.31 (0.71)	2.64*
non-Hispanic black	50.73 (0.78)	-1.81

Hispanic	50.97 (0.83)	-1.76
other	51.92 (1.49)	-0.13
Primary independent variables:		
Parental depression		7.80***
parental depression	59.50 (1.05)	
no parental depression	50.82 (0.54)	
Parental drug use		3.59**
significant parental drug use	58.73 (1.91)	
no significant drug use	52.09 (0.55)	
Parental alcohol misuse		1.09
significant alcohol misuse	54.31 (2.08)	
no significant alcohol misuse	52.03 (.50)	
Physically abusive parenting		5.76***
abusive parenting	54.04 (.61)	
no abusive parenting	48.28 (0.74)	
Neglectful parenting		4.79***
neglectful parenting	56.01 (1.02)	
no neglectful parenting	51.00 (0.54)	

***p<0.001, **p<0.01, *p<0.05

A.1.2 Measures of parental functioning and child maltreatment

        To answer the third research question, a series of bivariate analyses with family income, parental functioning and child maltreatment variables were conducted. Results from these analyses are presented in Tables A.3 and A.4. The relationship between family income and neglectful parenting was tested using a weighted t-test (results not shown in table). Results indicated that family income was not associated with a greater likelihood of neglectful parenting (t= -1.75, p = .08); however the direction of the coefficient suggests that parents who reported less income were also more likely to report neglectful parenting. To understand what aspects of parental functioning were associated with neglectful parenting, a series of Wald chi-square analyses were conducted. As shown in Table A.3, parental depression was positively associated with childhood neglect (χ^2 =7.74, p=0.007), as was parental alcohol misuse (χ^2 =7.13, p=0.009). These results suggest that parents with greater depressive symptoms and alcohol use reported a higher percentage of neglectful parenting. Contrary to the research hypothesis, the bivariate association between parental drug abuse and neglectful parenting was not statistically significant (χ^2 =2.07, p=0.15). It should be noted that several studies using child welfare data have collapsed alcohol and drug abuse into a single variable to measure substance abuse (Chaffin et al., 1996; Libby et al., 2006), while the current study examined these risk factors separately

Table A.3: Chi-square test of family processes among parents with self-reported

neglectful parenting

	Neglectful parenting Unweighted frequencies (% with neglectful parenting)	Wald chi-square statistic
Parental functioning		
Parental depression		7.74**
parental depression	94 (5.21%)	
no parental depression	268 (14.40)	
Parental drug abuse		2.07
significant drug abuse	38 (0.84%)	
no significant drug abuse	308 (20.36)	
Parental alcohol misuse		7.13**
significant alcohol use	31 (1.75%)	
no significant alcohol use	332 (19.91%)	

***p<0.001, **p<0.01, *p<0.05

Similar to the case of neglectful parenting, the relationship between family

income and physical abuse was tested using a weighted t-test. Results showed that family

income was not statistically associated with physically abusive parenting (t = 1.18, p =

.24). To examine the relationship between determinants of parental functioning and

physically abusive parenting, Wald chi-square analyses were conducted. Results are

shown in table A.4. It was hypothesized that parental depression, drug abuse and alcohol

abuse would increase physically abusive parenting. However, in the case of physical abuse, only parental drug use was statistically significant (χ^2=5.40, p=0.02). The bivariate relationship between parental depression (χ^2=3.21, p=0.08) and parental alcohol abuse (χ^2=2.83, p=0.09) demonstrated marginal significance. This suggests that clinical levels of parental depression and alcohol use may increase the likelihood of physically abusive parenting; although in the context of the current analysis, this relationship was weak.

Table A.4: Chi-square tests of parental functioning among parents with a self-report history of physically abusive parenting

	Physically abusive parenting Frequencies (% within physically abusive parenting)	Wald chi-square statistic
Parental functioning		
Parental depression		3.21[+]
parental depression	192 (9.88%)	
no depression	873 (55.85%)	
Parental drug abuse		5.40*
significant drug abuse	53 (2.26%)	
no significant drug abuse	955 (63.67%)	
Parental alcohol misuse		2.83[+]
significant alcohol misuse	54 (2.95%)	
no significant alcohol misuse	1010 (62.83%)	

***p<0.001, **p<0.01, *p<0.05, + <0.10

A.2 Results from the SEM model with formative factors

A.2.1 Model fit indices for the proposed model

The covariance matrix of the proposed model was compared with the observed covariance matrix to determine goodness-of-fit. In the current study, χ^2 goodness-of-fit, CFI, TLI, and the RMSEA indices were used to assess the fit of the proposed model. According to the model fit criteria, it is optimal to have a small χ^2 value so that the p-

value is not significant. In the current study, the χ^2 goodness-of-fit statistic is statistically

significant, χ^2=57.04 (24, N = 1654), *p*=.002. However, as described in the methods

section, the χ^2 goodness-of-fit test is sensitive to sample size, resulting in significant p-

values for small discrepancies between observed and implied covariance structures.

Therefore, other model fit indices are used in combination with the χ^2 goodness-of-fit

test. The fit indices for the proposed model were, CFI=0.83, TLI=0.56, and the

RMSEA=0.03. With the exception of the RMSEA, all other fit indices suggest that the

model fit poorly with the data. Although the following section will describe the direct and

mediating relationships in the model, interpretation of the results should be done with

caution.

A.2.2 Direct and mediating effects of family income and family processes on child mental

health outcomes

Standardized coefficients for the relationships proposed in the conceptual

framework are presented in the text and in Figure A1. All three measures of parental

functioning were associated with family income. Family income was negatively

associated with drug use (b = -.37, p = <.001), indicating that lower income contributed

to greater drug use. The relationship between parental depression and family income was

positive (b =.10, p = .001), indicating that parents who reported higher income reported

worse mental health outcomes. However, it should be noted that a weighted t-test (not

shown) indicated non-significant differences in the mean income-to-needs ratio for

parents who reported clinical levels of parental depression compared with those who did

not report clinically significant depression. Low income was associated with higher alcohol misuse (b= -.32, p = .02). With the exception of the positive relationship between family income and parental depression, these findings were consistent with previous research studies that showed the negative impact of low income on behavioral health outcomes in the adult population.

Although family income was associated the three measures of parental functioning, with these variables in the model, the relationship between family income and child mental health (b=.11, p=.25) was not significant. While it was hypothesized that the relationship between family income and child mental health would be weak, it was not assumed that the relationship would be explained away completely. Furthermore, family income was not associated with physically abusive ($b = .12, p = .17$) or neglectful parenting ($b = .03, p = .81$)—which was consistent with the bivariate results.

Parental functioning was determined by clinical levels of parental depression, alcohol misuse and drug abuse. All three constructs loaded strongly on the formative factor, parental functioning. Parental depression had the strongest coefficient (b=.67, $p =$ <.001). Drug abuse (b= .55, p =.001) and alcohol misuse ($b = .46, p = .001$) were similar in strength. These results indicate that parental depression, alcohol misuse, and drug abuse were significant predictors of parental functioning. Likewise parental functioning was a strong predictor of physically abusive (b=.36, $p = .001$) and neglectful (b=.54 $p =$ <.001) parenting. However, for parental functioning to mediate the relationship between family income and physically abusive and neglectful parenting, the direct effects of

family income to child maltreatment would need to be significant. In the current model, the path coefficients were not significant. These findings suggest that parental functioning predicted physically abusive and neglectful parenting rather than mediated the relationship.

The next step was to examine physically abusive and neglectful parenting as mediators between parental functioning and child mental health. Recall from the bivariate analyses, parental depression, alcohol abuse, drug abuse and physically abusive and neglectful parenting were all associated with higher child mental health problems. However, findings from the SEM analysis with all variables together reveal very different patterns. As previously mentioned, the direct effects of parental functioning on physically abusive and neglectful parenting were significant. Additionally, the direct path from parental functioning to child mental health was also significant ($b= .59$, $p = <.001$). In order for physically abusive and neglectful parenting to mediate the relationship between parental functioning and child mental health, the direct paths would have to be significant. However, when parental functioning is included in the model, the direct path from physically abusive ($b=.15$, $p =.15$) and neglectful parenting ($b= -.09$, $p =.33$) to child mental health lost statistical significance. This was contrary to the bivariate results that showed a significant relationship between both forms of maltreatment and greater child mental health problems. These findings suggest that the relationship between child maltreatment and mental health was obscured when parental functioning was included in the model.

A.2.3 Proposing a model without family income

As described above, the hypothesized model did not fit the data well. Therefore, interpretation of the results is not recommended. One option to improve the model fit was to remove family income from the formative factor model, because it appeared to lose statistical significance once other variables were included in the model. The biggest drawback to removing family income from the model is that it is inconsistent with the theoretical literature. In the family stress model, economic hardship is said to affect child development indirectly through family processes. Structural equation modeling (especially with cross-sectional data) requires that the direction of the paths be specified based on established theoretical relationships, as there is some aspect of causality implied in the way the variables are ordered and the direction of the arrows. Removal of a key variable, such as family income, would make the direction of the concepts in the path model atheoretical and the interpretation of the results difficult. Rather than removing family income from the model, an alternative way to examine the mediating effects of family income on the child mental health was conducted using a reflective model. The causal factor, parental functioning, was removed from the model and parental depression, alcohol misuse and drug abuse were examined as independent constructs. The results from this model are presented in Chapter 4.

Figure A.1: Standardized coefficients of the full model, controlling for child age, gender developmental services and parental race/ethnicity
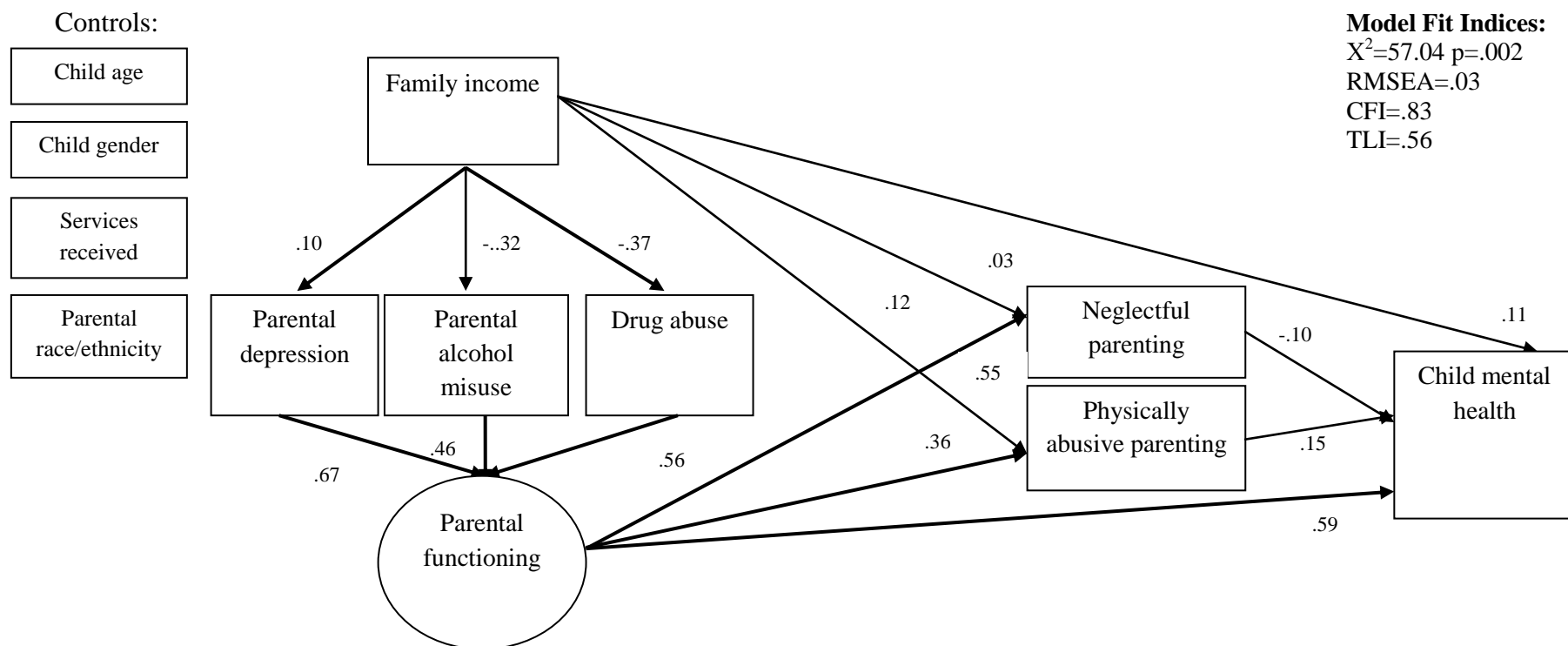
*Bolded pathways are statistically significant at *p <.05*

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VITA

Jodi Berger Cardoso received her Bachelor of Arts in Sociology from Portland State University in June, 1999. Following her degree, she joined the United States Peace Corps, where she was stationed in Santo Domingo, Ecuador until 2002. Returning home, she pursued a Master of Science in Social Work from Columbia University in New York, where she graduated in 2004. While in New York, she provided services to children and families in an out-patient clinic and high school. After her master degree, Jodi worked in several out-patient behavioral health clinics in Houston, Texas. Her work focused on providing individual and family therapy to Spanish-speaking children and their families. Prior to coming back to school, she ran a school based mental health clinical for children, where she was the only Spanish-speaking clinician in six school clinics. Jodi began her doctoral education in September, 2007. She will be starting as an assistant professor at the University of Houston, Graduate College of Social Work in September, 2012.

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This dissertation was typed by the author