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Does Parent Substance Use Always Engender Risk for Children? An examination of the relationships between substance use patterns, social support type, and child maltreatment behaviors

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Does Parent Substance Use Always Engender Risk for Children?
An examination of the relationships between substance use patterns, social support type, and child maltreatment behaviors

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Social Welfare

by

Nancy Jo Kepple

2015

ABSTRACT OF THE DISSERTATION

Does Parent Substance Use Always Engender Risk for Children?
An examination of the relationships between substance use patterns,
social support type, and child maltreatment behaviors

by

Nancy Jo Kepple
Doctor of Philosophy in Social Welfare
University of California, Los Angeles, 2015
Professor Bridget Freisthler, Chair

Background and Aims. Parent substance use is associated with an added risk for child maltreatment, yet little is understood about how the continuum of use behaviors contributes to differential risk. Social supports also may provide resources and social engagement that mitigate substance-related risks. However, the protective nature of social support is likely to vary by the type of support and the level of parents' substance-related impairments. Guided by social information processing models of abuse and neglect, this study examined the relationships between parent substance use patterns, social support types, and child maltreatment frequencies.

Methods. Secondary data analyses were conducted using the National Survey of Child and Adolescent Well-Being (NSCAW I). The study sample was composed of 2,100 parents from Wave 4. Weighted negative binomial regression models assessed key relationships, controlling for prior service history, risk factors, and demographics.

Results. Substance use disorder (SUD) was associated with a higher frequency of general maltreatment compared to lifetime abstinence or former use. When decomposed by type, any current alcohol or illicit drug use was associated with a higher frequency of physical abuse, and higher substance use intensity was associated with a higher frequency of emotional abuse. Only SUD was associated with a higher frequency of neglect. For physical abuse, current substance users with moderate levels of resource-based support were associated with a higher frequency compared with abstainers/ex-users with moderate levels of resource-based support. For neglect, moderate levels of social companionship among parents with SUD were associated with a higher neglect frequency than non-problematic and problematic users with the same level of social companionship. Among problematic users, moderate levels of social companionship were associated with lower neglect frequency than low levels of social companionship.

Conclusions. Substance use behaviors vary in their contribution to risk for different type of child maltreatment, and the protective nature of social supports differ across substance use patterns. Assessment and prevention efforts should factor in the complexity of these relationships when engaging substance-using parents. Future research would benefit from incorporating more nuanced substance use measures, examining the role of social context in mitigating harms, and directly measuring neuropsychological impairments.

This dissertation of Nancy Jo Kepple is approved.

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2015

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ACKNOWLEDGMENTS

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CHAPTER 1: INTRODUCTION

Scope and Nature of Child Maltreatment

Child maltreatment refers to a constellation of harmful, interrelated behaviors directed toward a child (Manly, 2005). These behaviors are commonly delineated by acts of omission such as neglect and acts of commission such as physical abuse, emotional abuse, and sexual abuse; they are connected through their ability to cause or contribute to imminent physical, cognitive, and emotional harm (Herrenkohl, 2005; Leeb, Paulozzi, Melanson, Simon, & Arias, 2008; Sedlak et al., 2010). Based on child protective services (CPS) agency data, 9.1 per 1,000 children in the United States were estimated to be maltreated in 2011 (US DHHS, 2012). The maltreatment rate is likely to be higher among the general population, because general population surveys identify children who are not typically reported to and/or investigated by CPS agencies (e.g., Hussey, Chang, & Kotch, 2006; Finkelhor, Turner, Ormrod, & Hamby, 2009; Sedlak et al., 2010; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998).

Research over the past 30 years has identified negative child outcomes associated with child maltreatment across physical, cognitive, emotional, and social domains (see Ammerman, Cassisi, Herson, & Van Hasselt, 1986; Cicchetti & Toth, 2005; Hilyard & Wolfe, 2002; and Trickett & McBride-Chang, 1995, for comprehensive reviews). Child maltreatment is also associated with undesirable adult outcomes, including high-risk health behaviors such as sexual promiscuity, smoking, and alcohol abuse (Anda et al., 1999; Dube et al., 2002; Lewis et al., 2011; Horowitz, Widom, McLaughlin, & White, 2001; Thornberry, Henry, Ireland, & Smith, 2010; Widom, Ireland, & Glynn, 1995); problematic intimate relationships (Colman & Widom, 2004); compromised economic well-being (Currie & Widom, 2010); involvement with the criminal justice system (Thornberry et al., 2010; Widom, 1989; Wilson & Widom, 2009); and mental health problems (Horowitz et al., 2001; Read, Os, Morrison, & Ross, 2005; Widom, DuMont, & Czaja, 2007). It is estimated that child maltreatment in the United States has a total lifetime

economic burden of $124 billion for incidence of new child maltreatment cases over the course of one year (Fang, Brown, Florence, & Mercy, 2012).

Children exposed to parental substance misuse have an added risk of experiencing child maltreatment and associated costs, which warrants special attention. An estimated 34% to 80% of families involved with Child Protective Services (CPS) are affected by parent substance use problems (Barnard & McKeganey, 2004; De Bortoli et al., 2013; Forrester, 2000; Hayden, 2004; Murphy et al., 1991; Young et al., 2007). Children not identified by the child welfare system are also likely to be exposed to parent substance misuse and at a higher risk for experience maltreatment. Within the general population, families in which at least one parent abused any alcohol or drugs were associated with a three times higher likelihood of physical abuse and four times higher likelihood of neglect compared with families with no history of alcohol or drug abuse (Kelleher, Chaffin, Hollenberg, & Fischer, 1994). Increased risk of physical harm to one's child arises due to intentional injury, accidental injury, and child accidental exposure to/ingestion of substances in the home (Wells, 2009). In addition, these families experience a higher rate of disruption through both informal care arrangements with family members and formal child placement into foster care (Barnard, 2003; Barnard & McKeganey, 2004; De Bortoli, Coles, & Dolan, 2013; Kolar, Brown, Haertzen, & Michaelson, 1994; Marcenko, Lyons, & Courtney, 2011; Zuravin & DePanfilis, 1997). Once identified by the child welfare system, these children experience lower rates of reunification and longer stays in foster care (US DHHS, 1999). In the most extreme cases, child death can result: 15.7% of documented child fatalities in 2010 involved children who were exposed to drug abuse by at least one parent (US DHHS, 2011). This dissertation study was designed to further examine factors that may influence risk for child maltreatment behaviors among substance-using parents, such as a continuum of substance use behaviors and types of social support.

The Role of Substance Use Behaviors & Social Support in Child Maltreatment

Parents' substance misuse is a prevailing risk factor that has been targeted since a rise in the number of substance-using mothers was observed during the late 1980s (Wulczyn, 2009). The vast majority of literature supports a positive relationship between parent substance use disorder (i.e., abuse or dependence of alcohol and/or other drugs) and any child maltreatment occurrence (Barnard & Mckeganey, 2004; Dunn et al., 2002; Magura & Laudet, 1996; Staton-Tindall, Sprang, Clark, Walker, & Craig, 2013). However, substance use occurs along a continuum of behaviors and further research is necessary to clarify if increasing use (often associated with increasingly compromised parent functioning) is related to a higher frequency of general maltreatment behaviors (Institute of Medicine, 1990).

Across types of maltreatment, studies report similar findings as observed for general maltreatment outcomes. A consistent positive relationship between physical abuse and current problematic substance use (i.e., heavy drinking or illicit drug use) or current substance use disorder exists; however, inconsistent findings have been observed for the importance of lifetime substance use disorder (Ammerman et al., 1999; Hien, Cohen, Caldeira, Flom, & Wasserman, 2010; Kelleher et al., 1994; Leonard, 2002; Walsh et al., 2003). Neglect studies have predominantly focused on parent substance use disorder as a risk factor for neglect outcomes (Brown et al., 1998; Chaffin et al., 1996; Dube et al., 2001; Kelleher et al., 1994; Ondersma, 2002; Sedlak et al., 2010; Slack et al., 2011). However, several studies with nonsignificant or more complex findings are present, which complicates our understanding of this association (Freisthler, Johnson-Motoyama, & Kepple, 2014; Slack et al., 2011; Slack et al., 2004). While there is evidence that parent alcohol and/or drug use may contribute to increased risk of emotional abuse, the specific relationships between type of substance use behavior (e.g., non-problematic use versus substance use disorder) and emotional abuse remain unclear (Dube et al., 2001; Gibbs et al., 2008; Palusci & Ondersma, 2012; Sedlak et al., 2010). Two studies specific to physical abuse and one study about neglect have examined these

relationships in more nuanced ways (Berger, 2005; Freisthler, Holmes, & Price Wolf, 2014; Freisthler, Johnson-Motoyama, & Kepple, 2014). All studies provide initial evidence that frequency and/or intensity of parent alcohol use behaviors may help to better understand the complex relationship between a *continuum* of substance use behaviors and child maltreatment outcomes. In addition, further research is needed that explicitly compares how the relationship between substance use behavior patterns and child maltreatment behaviors differs across type, given variations observed between studies about different forms of maltreatment. This approach may provide insight into processes unique for each maltreatment type. For example, only more intense forms of substance use, such as parents with substance use disorder, may cause parents to fail to meet their child's basic needs while less intense forms of substance use, such as light or moderate drinking, may be sufficient for a momentary verbal assault of a child.

In contrast to substance use, social support has predominantly been defined as a protective global construct in the child maltreatment literature. It encompasses a range of behaviors including provision of resources (i.e., tangible, emotional, or cognitive) and social companionship (DePanfilis, 1996). Despite their theoretically distinct nature (Cohen et al., 2000), the majority of studies conflate resource-based supports with social companionship (Thompson, 2014). The child maltreatment studies that have examined these two types of social support separately indicate that while perception of the availability of resource-based supports were predominantly protective (Berlin et al., 2011; Coohey, 1996, 2000; Freisthler, Holmes, & Price Wolf, 2014; Li et al., 2011; Sidebotham & Heron, 2006), mixed findings were observed for social companionship (Coohey, 1996, 2008; Freisthler, Holmes, & Price Wolf, 2014; Lesnik-Oberstein, Koers, & Cohen, 1995). In fact, one study observed perceived social companionship was associated with a higher frequency of physical abuse behaviors (Freisthler, Holmes, & Price Wolf, 2014). Future work would benefit from not only further exploring the role of social companionship in isolation from resource-based supports for child maltreatment but also from exploring when social connections may reinforce rather than protect against deviant behaviors

such as child maltreatment (Baumeister & Leary, 1995; Kawachi & Berkman, 2001; Thompson, 2014).

Along these lines of thought, substance use risk may be moderated by social conditions, such as types of social support available within one's network (Zinberg, 1984). However, little research looked at the interaction between substance use and social support. A few studies provided insight into how these variables relate by demonstrating low social support was associated with child abuse potential (Williams-Peterson et al., 1994), child welfare involvement (Taplin & Mattick, 2013), or parenting stress (Kelley, 1998) for substance-using parents. One study observed that social support may not always be protective when examining physically abusive behaviors within an alcohol-using population (Freisthler, Holmes, & Price Wolf, 2014). Specifically, tangible and emotional supports were associated with a lower frequency of physical abuse for alcohol-using parents, whereas social companionship was associated with a higher frequency of physical abuse for alcohol-using parents (Freisthler, Holmes, & Price Wolf, 2014). Resource-based supports may be generally protective while social companionship but not social companionship, since it comes with pressure to conform for acceptance without the benefits of resources that may directly protect parenting (Kawachi & Berkman, 2001; Warde et al., 2005).

Finally, social information processing models of abuse and neglect provide a guiding framework to think about how these factors interact (Crittenden, 1993; Milner, 1993, 2000). Higher intensity of substance use may be related to higher impairments in parent's ability to attend to, interpret, decide a response to and/or execute a decision related to their children's words or actions. In contrast, higher levels of social support, particularly resource-based, may contribute to higher levels of parent functioning and/or compensate for impairments in parent's social information processing, reducing the frequency of maltreatment incidents. Yet, the nature of the relationship between social support and child maltreatment may be more understandable within a context of parent substance use behaviors. For instance, parents meeting criteria for substance use disorder may be more likely to socialize with other high-risk users (Tracy et al.,

2012), reinforcing deviant behaviors that can contribute to poor decision-making and a subtle downward leveling of norms (e.g., increased tolerance for the child to be placed in unsafe environments). Thus social companionship may be potentially harmful for parents demonstrating specific substance-use behavior patterns. It is also likely that resource-based social supports provide greatly help to buffer substance-related harms that are not likely present for non-substance using parents. We know from qualitative work that informal interventions from friends and family members occur commonly among substance-using parenting populations, protecting children from substance-related harm without formal interventions from the child welfare system (Barnard, 2003).

In sum, it is an oversimplification to state that all substance use is harmful and all social support is helpful for children and families (e.g., Freisthler, Holmes, & Price Wolf, 2014; Thompson, 2014). This dissertation study will build upon the extant literature by examining if higher intensity of substance use is related to a higher frequency of child maltreatment behaviors and comparing differences in this relationship across maltreatment type. In addition, this study will address concerns about conflating resource-based supports and social companionship by examining how specific types of social support are associated with child maltreatment behaviors. Finally, the study will explicitly explore if social support moderates the relationship between parent substance use and child maltreatment behaviors to understand how social conditions may create unexpected risks and protection for different groups of substance-using parents.

Dissertation Study Purpose & Overview

This dissertation used the National Survey of Child and Adolescent Well-Being (NSCAW), a national longitudinal dataset of high-risk families who were investigated by the child protective services but did not necessarily receive services. Cross-sectional, secondary analysis were used to examine how parent substance use patterns are associated with child maltreatment frequency, how different types of social support may be related to child

maltreatment frequency, and how types of social support may moderate the relationship between substance use patterns and child maltreatment frequency. Our general understanding of parent substance use largely determines which families are identified as high risk and subsequently brought into the child welfare system. Studies have shown that case worker perceptions of substance use were more predictive of child welfare outcomes even when other risk factors are present (Berger, Slack, Waldfogel, & Bruch, 2010). In reality, substance use alone should not be sufficient to justify highly invasive interventions (e.g., court involvement and/or child removal), especially if other aspects of the social environment, such as the presence of resource-based social supports, may mitigate risk of substance-related harms (Freisthler, Holmes, & Price Wolf, 2014; Thompson, 2014; Zinberg, 1984). Differentiating between substance use behaviors, types of social supports, and how supports moderate substance-related harms can lead to more accurate risk assessments for child maltreatment and to better targeted prevention and intervention (Young, Boles, & Otero, 2007). More specifically, tailoring interventions both to use-specific behaviors and social context is essential, especially in a policy environment that imposes time-limited services with families that remain within the child welfare system for longer periods of time on average (Young & Gardner, 2002; US DHHS, 1999).

To better understand the complex nature of these relationships, I proposed four research questions for this dissertation study:

(1) Are parent substance use patterns (i.e., abstainer/ex-user, non-problematic use, problematic use, SUD, and in recovery) associated with frequency of general maltreatment?
(2) Are parent substance use patterns associated with the frequency of child maltreatment type (i.e., physical abuse, emotional abuse, and neglect)?
(3) Is perceived social support type associated with frequency of child maltreatment type?

(4) Does perceived social support type moderate the relationship between parent substance use patterns and frequency of child maltreatment behaviors?

Guided by social information processing models of abuse and neglect (Crittenden, 1993; Milner, 1993, 2000), this study theorizes that neuropsychological impairments (i.e., compromised cognitive and emotional processing) may be differentially observed across five substance use behavior patterns (defined at the beginning of Chapter 2): abstainers/ex-users, non-problematic users, problematic users, those meeting criteria for substance use disorder, and those in recent recovery from a substance use disorder. Recent evidence suggests neuropsychological impairments arising from substance use vary by the intensity of recent use behaviors and thus should create variable risk for the frequency of maltreatment behaviors (Fernandez-Serrano, Pérez-García, & Verdejo-García, 2011; Fillmore, 2012; Maldonado, 2010; Oscar-Berman & Marinkovic, 2007; Vik, Cellucci, Jarchow, & Hedt, 2004). As a result, frequency of child maltreatment would likely be higher as intensity of substance use behaviors and associated impairments increases. In addition, social information processing models also suggested that the stages involved in the creation of abuse and neglect behaviors are likely to differ and that these behaviors may differ by type of maltreatment (Crittenden, 1993; Milner, 1993, 2000).

The study next examined the relationship between types of social supports with two distinct processes—resource-based supports and social companionship—and child maltreatment. Social supports can promote parental functioning by providing resources that directly compensate for parenting behaviors arising from impaired social information processing (e.g., providing child care while parent is sick or incapacitated; Belsky, 1984, 1993; Cohen & Wills, 1985). These supports may also decrease distress in a way that improves the parents' ability to perceive their environment or others' actions, to solve problems effectively, and/or to regulate their emotions through reduction of emotional reactivity (Goodman, Rietschel, Lo,

Costanzo, & Hatfield, 2013; Hostinar, Sullivan, & Gunnar, 2014; Raio, Orederu, Palazzolo, Shurick, & Phelps, 2013; Taylor, 2011). Although social companionship may provide social contacts that buffer stress experiences through providing feelings of belonging (Cohen, Gottlieb, & Underwood, 2000; Goodman et al., 2013; Hostinar et al., 2014; Raio et al., 2013; Taylor, 2011), it also poses risks for increased socialization away from the family (Coohey, 2008; Warde et al., 2005) and subsequent distraction that can contribute to neglect. Social groups can also place pressure on parents to conform to beliefs to secure these social connections (Baumeister & Leary, 1995; Kawachi & Berkman, 2001). Group norms that reinforce abusive parenting practices can increase risk for maltreatment through priming a parent to prioritize aggressive responses to a child's behavior (Baumeister & Leary, 1995; Belsky, 1993).

Finally, the study examined the interaction between parent substance use and social support in relation to child maltreatment frequencies. The availability of resources or social companionship in one's network may alter the effects of alcohol and drug use, allowing us to differentiate between controlled users (i.e., use without harm to children) and uncontrolled users (i.e., use with harm to children) (Zinberg, 1984). The presence of resources to protect children may become even more important as impairments in parent neuropsychological functioning become more prevalent, buffering children from the harms of parent intoxication and withdrawal (Barnard, 2003). In cases of acute intoxication and withdrawal, these supports would have to be present only during these times of impairments; however, higher levels of resources may be required to address more pervasive impairments associated with substance use disorder. In contrast, a large network of recreational friends and/or acquaintances could influence parenting norms for the better or worse depending on the composition of this network (Belsky, 1993; Zinberg, 1984). For example, parents reporting current substance use disorder are likely to be socializing with a network that is composed of other substance users who are engaged in risky and harmful behaviors associated with uncontrolled use (Galea, Nandi, & Vlahov, 2004; Rice, Milburn, & Monro, 2010; Wills & Vaughan, 1989).

In sum, the current study used the NSCAW data in unique ways to address observed gaps within the literature. First, prior studies have predominantly focused on current substance used disorder. This study used parent self-reported alcohol and illicit drug use from Wave 1, Wave 3, and Wave 4 to construct parent substance use behavior patterns that factored in recent use (within the past 4 years). Second, previous studies have looked at social support as a global construct which potentially conflates resource-based supports and social companionship. This study operationalized social support to reflect these two distinct types and examined differences in their relationships with child maltreatment frequency. Finally, this study explicitly looks at previously unexplored interactions between substance use behavior patterns and social support type. Through the decomposition of these concepts, this study looked beyond the broad questions of whether substance use is risky and social support is protective to more specific questions about what aspects of substance use is risk and what forms of social support are protective. This type of detailed understanding is necessary to begin tailoring social work practice and policies to the specific and complex needs of substance-using parents.

Organization of the Dissertation Study

Chapter 1 briefly outlined the scope and nature of child maltreatment among substance-using parents; critiqued our current understanding of substance use as a commonly identified risk factor and social support as a commonly identified protective factor; and presented the study overview and purpose. Chapter 2 reviews the current literature of the relationship between parent substance use, social support, and child maltreatment. Chapter 3 introduces the study's conceptual model guided by social information processing models of abuse and neglect; it concludes with an outline of the research questions and associated hypotheses. I outline the methods for the study in Chapter 4, which includes a detailed description of the data source's original design and sample, study sample, and analytic approaches. Chapter 5 presents the results organized by research question. Chapter 6 discusses the conclusions, strength and limitations of the study, and implications for social work practice and future research.

CHAPTER 2: LITERATURE REVIEW

This chapter describes the study population of substance using caregivers and reviews literature assessing the relationships between substance use, social support, and child maltreatment. First, the chapter introduces the scope parent substance use and the challenge of defining the multi-dimensional construct of substance use. This is followed by looking at evidence for: (a) substance use and child maltreatment, (b) social support and child maltreatment, and (c) social support and child maltreatment within substance-using populations. The chapter concludes with a summary of the observed gaps in the literature.

Scope of Parental Substance Use

Substance use has remained a central concern in the child welfare system due to an estimated 34% to 80% of families involved with Child Protective Services (CPS) being affected by parent substance use problems (Barnard, 2003; Barnard & McKeganey, 2004; De Bortoli et al., 2013; Forrester, 2000; Hayden, 2004; Murphy et al., 1991; Young et al., 2007). However, CPS involvement tells only part of the story since only a small percentage of children exposed to parent substance use may come into contact with the children welfare system (Huang, Cerbone, & Gfroerer, 1998; Young, Boles, & Otero, 2007). In the general population, an estimated 8.3 million children (11.9%) resided with at least one parent who met criteria for current substance abuse or dependence problems between 2002 and 2007 (SAMHSA, 2009). Another general population survey estimated about 11% of children harmed by child maltreatment were exposed to some form of alcohol and/or drug abuse (Sedlak et al., 2010). Within clinical populations, about two thirds of women receiving some form of drug treatment reported being mothers of dependent children under 18 (Grella, Hser, & Huang, 2006; Stewart, Gossop, & Trakada, 2007). Combining general, child welfare, and clinical population estimates, a concerning number of children are likely to be exposed to parental substance use and associated harms, such as an increased likelihood for child maltreatment (e.g., Kelleher et al., 1993; Sedlak et al., 2010).

Complex Nature of Defining Substance Use Behaviors

Before delving into a review of the child maltreatment literature, it is essential to acknowledge the complex nature of defining and measuring substance use. These behaviors involve a range of factors, including the type of drug, amount and/or rates of use, and timing and/or duration of use (Mayes & Truman, 2002; WHO, 2000). Substances of abuse are psychoactive in nature (i.e., they can alter one's mood and/or distort one's perceptions) and impair other motor and biological functions (NIDA, 2012). I used the general term *substance use* in the current study to define any use of steroids, alcohol, cannabis, stimulants, opioids, sedatives/hypnotics/anxiolytics, inhalants, and hallucinogens (American Psychiatric Association [APA], 2000, 2013; World Health Organization [WHO], 2000).

Within the general population, substance use behaviors occur along a continuum (Institute of Medicine, 1999; SAMHSA, 2012). Behavioral categories are often defined to capture both consumption and consequences through combining use frequency, correlates with substance-related harms (e.g., death, aggression or family disruption), and psychoactive effects and/or the consequences of their use (e.g., tolerance, withdrawal, impaired control associated with disinhibition) (American Psychiatric Association [APA], 2000, 2013; Institute of Medicine, 1999; World Health Organization [WHO], 2000). For the purposes of this dissertation, I identified five substance use behavior categories with increasing intensity of use (defined by both consumption and consequence). *Abstainers* or *Ex-Users* are defined by former users or non-problematic use with a no recent history of substance use disorder within the past 4 years. *Non-problematic substance use* defined any light or moderate drinking without any illicit drug use. *Problematic substance use* defined any hazardous or high risk use patterns that increases the likelihood of physical and/or social harm to the individual (e.g., four or more drinking on a given occasion and/or any illicit drug use). S*ubstance use disorder* captured diagnoses that attempt to categorize substance use with actual physical and/or social harm to the individual (APA, 2000, 2013). Individuals *in recovery* are defined as former users or non-problematic use with a recent

experience of substance use disorder within the past 4 years (Fiorentine, 1999; Jason, Olson, Ferrari, & Sasso, 2005).

Parent Substance Use and Child Maltreatment

Concerns about problematic alcohol and/or drug use by parents are based in their association with compromised parent functioning and with child harm (Barnard & McKeganey, 2004; Dunn et al., 2002; Leonard & Eiden, 2007; Wells, 2009). Several reviews focused on substance use disorder (specific to illicit drug use) and found support to claim a compelling positive association between substance use disorder and general maltreatment (Barnard & Mckeganey, 2004; Magura & Laudet, 1996) and neglect (Dunn et al., 2002; Testa & Smith, 2009). In a systematic review, Staton-Tindall et al. (2013) observed consistent positive associations between several child maltreatment outcomes (e.g., general maltreatment, physical abuse, and neglect) and single indicator variables of substance use (ranging from any nonproblematic use to any problematic use to substance use disorder) with inconsistencies in the focus on only alcohol, on only illicit drugs, or on alcohol and illicit drugs. Other reviews have focused solely on parent alcohol use (Leonard, 2002; Widom & Hiller-Sturmhofel, 2001). Widom & Hiller-Sturmhofel (2001) emphasized that the relationship between parent alcohol use and physical abuse behaviors remains unclear given inconsistencies observed across studies. Leonard (2002) observed clear associations between any problematic alcohol use and child maltreatment (including general maltreatment, physical abuse, and neglect).

Several studies noted the importance of acknowledging the co-occurrence between parent alcohol and drug use with other child maltreatment risk factors (e.g., mental health issues, criminal activity, lack of resources, and social isolation; Stanton-Tindall et al., 2013; Testa & Smith, 2009; Wells, 2009). Stanton-Tindall et al. (2013) observed that few studies controlled for important family risk factors, making it difficult to make the case that substance use uniquely contributed to child maltreatment behaviors. Testa and Smith (2009) went a step further to argue that confounding risk factors, such as parental depression and limited social

connections providing resource, may better explain the association between child maltreatment outcomes and substance use disorders involving alcohol and illicit drug. In reality, we know that parent substance use is just one of many prevailing risk factors (e.g., Stith et al., 2009), and it is plausible that social conditions exist where substance use is buffered or controlled in a way that protects children from substance-related harms (Cicchetti & Toth, 2005; Dunn et al., 2002; Zinberg, 1984).

Stanton-Tindall et al. (2013) also noted that two child-focused studies incorporated sophisticated measures of parent alcohol and drug use (e.g., Addiction Severity Index (ASI), Michigan Alcohol Screening Test) that allowed for validated measures of intensity and frequency of substance use, but these studies focused on outcomes related to family violence exposure (Connors-Burrow, Johnson, & Whiteside-Mansell, 2009; Jester, Jacobson, Sokol, Tuttle, & Jacobson, 2000). Specifically, frequent heavy alcohol use was positively associated with the frequency of a child observing violence within the household (Jester et al., 2000), and severity of substance use was positively associated with child witnessing violence in the household (Conners-Burrow et al., 2009). Stanton-Tindall et al. (2013) also observed one child maltreatment study that used less rigorous methods to obtain a frequency of parent alcohol intoxication and drug intoxication (e.g., self-report of number of times drunk and number of times high in the past year; Berger, 2005). Specifically, Berger (2005) found only maternal frequency of alcohol intoxication (but not drug intoxication or paternal frequency of intoxication) was associated with a higher likelihood of physical abuse. These results do not explore other aspects of use, such as intensity (e.g., use with problems in functioning) or frequency of use without intoxication, both of which may contribute to unobserved associations with physical abuse. Given a strong co-occurrence between domestic violence and other forms of abuse (Appel & Holden, 1998; Edleson, 1999) and some initial evidence that intoxication frequency may increase risk for physical abuse in some cases, further examination is required to

understand if these dimensions of substance use may also contribute to increased risk for abuse and neglect behaviors.

In combination, these reviews observed evidence to suggest a positive association between parental substance use disorder and child maltreatment behaviors. That being said, they do not clearly establish what unique relationship may exist between child maltreatment and substance use behaviors not meeting criteria for substance use disorder. In addition, the reviews consistently critiqued two features of the extant literature. First, the vast majority of child maltreatment studies operationalized substance use as a dichotomous variable for *any substance use* or *any substance misuse* which prevents studies from being able to capture the relationship between intensity and frequency of parent substance use behaviors and child maltreatment outcomes. In fact, only one of the reviewed studies used more precise measures of substance use (e.g., gradations of intensity and/or frequency of use) when examining physical abuse outcomes, which suggests a potential area for future study to help understand these unique relationships. Second, few studies controlled for essential family risk factors, which limits our understanding of how substance use uniquely contributes to child maltreatment risk. In the subsequent sections, I explore more recent literature, seminal works, and older studies excluded from these reviews due to substance use being included as a control variable. I sought to further clarify what was currently known about the nature of the relationship between substance use patterns and child maltreatment behaviors given the assumption that substance use behaviors occur on a continuum.

Parent Substance Use and General Child Maltreatment

More recent studies continued to observe a positive relationship between parent substance use and general child maltreatment outcomes. Studies sampling from child welfare populations predominantly found a positive association between substance use and child welfare involvement, specific to *child removal* (De Bortoli, Coles, & Dolan, 2013; Forrester & Harwin, 2006; Marcenko et al., 2011; McGlade, Ware, & Crawford, 2009; Smith, Johnson,

Pears, Fisher, & DeGarmo, 2007), *re-entry into foster care* (Brook & McDonald, 2009), and *re-reporting after initial contact with CPS* (Fluke, Shusterman, Hollinshead, & Yuan, 2008; Fuller & Wells, 2003; Laslett, Room, Dietze, & Ferris, 2012; Wolock & Magura, 1996). These studies varied in their operationalization of substance use, including dichotomous variables for: (a) any past or current alcohol and/or drug use (Brook & McDonald, 2009; De Bortoli et al., 2013; Smith et al., 2007; Fuller & Wells, 2003); (b) any current illicit drug use (McGlade et al., 2009); (c) any current harmful substance use (Forrester & Harwin, 2006); (d) any current alcohol use disorder (Laslett et al., 2012); or (e) current substance use disorder including both alcohol and other drugs (Fluke et al., 2008; Marcenko et al., 2011; Wolock & Magura, 1996).

A few studies did not observe a significant relationship (Dubowitz et al., 2011; Thornberry et al., 2014). Dubowitz et al. (2011) found no association between maternal lifetime illicit drug use and subsequent CPS reports. Thornberry et al. (2014) observed only parent alcohol use (defined as at least 3 to 4 drinks half the time when drinking) was associated with maltreatment of older children (i.e., late adolescence). In contrast, parent alcohol use was not associated with maltreatment of early adolescent children, and parent lifetime marijuana use was not associated with maltreatment of children within any age grouping. The use of an imprecise measure (i.e., lifetime use) combined with inclusion of important control variables such as parent depressive symptoms may explain the lack of association observed in both studies.

As observed with prior literature reviews, these studies have predominantly measured parent substance use as a single indicator ranging from *any substance use* to *any substance use disorder*. No study focused on general maltreatment used more nuanced or precise measures of substance use defined by intensity or frequency of use. In addition, these studies typically used data from CPS administrative records (Brook & McDonald, 2009; De Bortoli et al., 2013; Fluke at al., 2008; Forrester & Harwin, 2006; Fuller & Wells, 2003; Laslett et al., 2012; McGlade et al., 2009; Smith et al., 2007) with one using parent self-report (Marcenko et al.,

2011). Given the predominant use of administrative records, these outcomes are also potentially biased by caseworker perceptions, whose beliefs of caregiver substance abuse were predictive of CPS involvement regardless of the presence of other risks (Berger et al., 2010) and by heightened surveillance of families with prior CPS involvement (Barth, Gibbons, & Guo, 2006; Drake & Zuravin, 1998). Some studies suggest controlling for factors, such as parent criminal involvement, mental health and economic hardships, may also be important when measuring the association between substance use and child welfare involvement (Gilchrist & Taylor, 2009; Grella et al., 2006), re-referrals (Brown, Cohen, Johnson, & Salzinger, 1998; Fuller & Wells, 2003; Laslett et al., 2012), or termination of parental rights (Meyer, McWey, McKendrick, & Henderson, 2010).

Finally, measurement of the larger construct of general maltreatment does not allow us to distinguish different relationships that may exist between parent substance use behaviors and specific types of maltreatment. Child maltreatment is a global construct that includes multiple dimensions of interrelated behaviors (Manly, 2005), with the most commonly recognized behaviors categorized as acts of omission (e.g., neglect) and acts of commission (e.g., abuse) (Finkelhor, Ormrod, Turner & Hamby, 2005; Leeb et al., 2008; Sedlak et al., 2010; US DHHS, 2012). For example, low levels of disinhibition that arise from non-problematic substance use may result in a higher likelihood of verbal assault associated with emotional abuse, but a higher level of disinhibition from problematic substance use may be required to increase the likelihood of physical assault associated with physical abuse. The studies reviewed up to this point also defined measures of child maltreatment based upon the presence of any maltreatment outcome within a given timeframe. However, child maltreatment is a complex construct that can vary on multiple dimensions, such as frequency or chronicity of behaviors (Herrenkohl, 2005; Litrownik et al., 2005; Manly, 2005). For example, substance use disorder may be associated with a higher frequency of maltreatment compared with other substance use patterns (e.g., non-problematic use or problematic use) given that substance use disorders are associated with a

higher frequency of intoxication and persisting neuropsychological impairments that can more consistently impair parental functioning compared with other use behaviors (Fillmore, 2012).

Parent Substance Use and Child Physical and Emotional Abuse

Physical abuse and emotional abuse are two distinct forms of child abuse. The former is defined by physical assault whereas the latter is defined by verbal assault. Of the two, emotional abuse tends to occur more frequently (Claussen & Crittenden, 1991; Kairys & Johnson, 2002; Slep, Heyman, & Snarr, 2011; Straus & Field, 2003; Yates, 2007).

Physical Abuse. Consistent with Leonard (2002), two studies observed any problematic substance use was associated with physical abuse outcomes (Brown et al., 1998; Walsh et al., 2003). For example, Walsh et al. (2003) observed adult victims self-reported a higher likelihood of childhood physical abuse when they recalled any parental drinking or drug problems. Brown et al. (1998) observed any maternal sociopathy (alcohol or drug problem combined with police involvement) was associated with physical abuse. Chaffin et al. (1996) also observed the onset of child abuse was more likely to occur when parent substance use disorder was present in the family during the prior year.

Several studies incorporated past history of use explicitly into their designs (Ammerman et al., 1999; Hien, Cohen, Caldeira, Flom, & Wasserman, 2010; Kelleher et al., 1994). Lifetime history of substance use disorder was associated with a higher likelihood of self-reported physical abuse behaviors in one study (Kelleher et al., 1994) and higher physical abuse potential that were more likely to be within clinical ranges in another study (Ammerman et al., 1999). In fact, no differences were observed between parents with current and with past lifetime (but not current) substance use disorder, suggesting elevated risk of parent substance use disorder may persist even for those who are not currently using. In contrast, Hien et al. (2010) observed that a lifetime history of a substance use disorder was not significantly associated with child abuse potential, after controlling for current depressive disorder with a small sample (*n* =

152). These discrepancies may be due to timing of when parents last met criteria for substance use disorder, which was not explicitly measured in any of the mentioned studies.

A meta-analysis of child maltreatment risk factors observed alcohol abuse to have a small effect size ($0.1 \geq |r| \leq 0.2$) for physical abuse and drug abuse to have a very small effect size ($|r| < 0.1$) for physical abuse with a nonsignificant measure of homogeneity within (likely due to a wide range of results across studies) (Stith et al., 2009). One study in addition to Berger (2005) has explored more nuanced measures of parent alcohol use: Freisthler, Holmes, & Price Wolf (2014) observed significant differences between all drinking patterns (e.g., ex-drinkers or frequent heavy drinking compared to lifetime abstainers) and the frequency of physical abuse except for infrequent heavy drinking (defined by consumption of five or more drinks once a month or less). However, drinker groups were only compared to lifetime abstainers and not between drinker groups.

In sum, a consistent positive relationship between current problematic substance use and physical abuse exists. Inconsistent findings have been observed for the importance of lifetime substance use disorder. If compromised parent functioning due to substance use disorder contributes to physically abusive behavior, then unmeasured factors such as differences in how recent the parent substance used disorder occurred may help to explain these differences. Initial evidence for the important of frequency or intensity of substance use for physical abuse is limited to two studies. Frequency of maternal intoxication from alcohol appears to increase likelihood of physical abuse behaviors (Berger, 2005). In another study, the findings indicated almost all drinking patterns (including ex-users of alcohol) were associated with a higher frequency of maltreatment than abstainers (Freisthler, Holmes, & Price Wolf, 2014); however, gradations in risk between levels of use were not evaluated which could provide additional insights into variation in frequency by use intensity.

Emotional Abuse. Only a few studies have explored the relationship between child emotional abuse and parent substance use (Dube et al., 2001; Gibbs et al., 2008; Palusci &

Ondersma, 2012; Sedlak et al., 2010). The National Incidence Study III observed parent alcohol abuse was a predominant issue observed among families with children who were identified as being emotionally abused (Sedlak et al., 2010). Dube et al. (2001) observed the likelihood of emotional abuse for women significantly increased when they recalled childhood experience of one or both parents abusing alcohol and the likelihood of emotional abuse for men significantly increased when their father or both parents abused alcohol. Gibbs et al. (2008) observed among military families that emotional abuse was significantly more likely to be present if alcohol or drug use was indicated at time of first incident; however, these results were based upon bivariate models that did not control for other risk factors. Palusci & Ondersma (2012) observed substance use treatment after a CPS investigation for emotional abuse was associated with an increased likelihood of emotional abuse re-occurrence. In this case, it is plausible that substance use treatment is a proxy for severity of parent alcohol or drug use problems that contributed to future emotional abuse.

While there is some evidence that parent alcohol and/or drug use may contribute to increased risk of emotional abuse, the specific relationships remain unclear. Insufficient information is provided to assess if specific patterns of substance use (e.g., non-problematic use compared substance use disorder) may be associated with emotional abuse behaviors. Further investigation of this type of maltreatment distinct from other forms of abuse could help to elucidate whether different patterns arise between parent substance use and emotionally abusive behaviors.

Parent Substance Use and Child Neglect

Child neglect poses a unique dimension of maltreatment that results when a parent does not take action to meet a child's basic needs. Several studies have also observed a positive relationship between parent substance use disorder and neglect outcomes (Brown et al., 1998; Chaffin et al., 1996; Dube et al., 2001; Kelleher et al., 1994; Ondersma, 2002; Sedlak et al., 2010; Slack et al., 2011). For example, The National Incidence Study (NIS-4) observed parent

drug abuse was associated with higher levels of neglect (measured by inadequate nurturance, failure to supervise, failure to provide care for needs) (Sedlak et al., 2010). Chaffin et al. (1996) also observed the onset of neglect was more likely when substance abuse/dependence was present in the family during the prior year. Of the neglect studies assessing lifetime substance use disorders among parents, both observed a positive association with self-report neglect behaviors (Kelleher et al., 2004) and substantiated CPS cases for neglect (Ondersma, 2002). Finally, Dube et al. (2001) observed that adult recall of parental alcohol abuse by one or both parents during their childhood was associated with higher likelihood of emotional and physical neglect.

As observed with physical abuse, only a few studies have diverged from the traditional cross-sectional evaluation of a dichotomous variable for neglect regressed on a dichotomous variable for parent substance use. Slack et al. (2004) observed no significant relationship between alcohol or drug use and CPS reports for neglect; however, this study only measured substance use that was in response to a stress life event, excluding a wide range of use behavior and lacking a clear timeframe. In a subsequent study, Slack et al. (2011) conducted secondary data analyses across three independent studies assessing risk factors of neglect, including problematic substance use. They observed (a) heavy drinking was not associated with CPS substantiation or parent self-report of neglect, (b) illicit drug use was not associated with CPS substantiation of neglect, and (c) illicit drug use was associated with self-reported neglect for one study reporting a large sample (Fragile Families, N = 1,820; Slack et al., 2011). It may be that use behaviors less intense than substance use disorder do not contribute to neglect behaviors; however, these nonsignificant findings may be a result of these studies controlling for a large number of family risk factors associated with neglect and not included in previously identified studies (Slack et al., 2011; Slack et al., 2004).

One study observed different relationships between distinct drinking behavior patterns and specific supervisory neglect behaviors using a general population sample, providing initial

evidence that the relationship between alcohol use and neglect is more complicated than suggested by studies utilizing less nuanced measures (Freisthler, Johnson-Motoyama, & Kepple, 2014). Specifically, they observed (a) current frequent heavy drinking was associated with a higher likelihood of leaving a child where he or she was not sure the child was safe compared with abstainers, (b) current infrequent heavy drinking and current moderate drinking were associated with a lower likelihood of unsafe monitoring of a child compared with abstainers, and (c) no relationship was observed between parent drinking pattern and leaving a child home alone or in a car alone (Freisthler, Johnson-Motoyama, & Kepple, 2014). This study's findings were limited by the use of one item measure for specific neglect behaviors (Freisthler, Johnson-Motoyama, & Kepple, 2014). To understand how a continuum of substance use behavior may be associated with neglect behaviors further examination is required using more robust measures.

In sum, the majority of studies found a positive association between parent substance use disorder and child neglect outcomes. However, several studies with nonsignificant or more complex findings are present, which complicates our understanding of this association. Neglect studies with nonsignificant findings either utilized narrow measures of substance use (i.e., use in response to a stressful event with no timeframe specification) and/or comprehensively controlled for family risk factors (Slack et al., 2011; Slack et al., 2004). Those with unexpected findings used a more nuanced approached to measuring parent substance use (i.e., varying patterns of use); however, the neglect outcomes were limited to one item measure for specific neglect behaviors (Freisthler, Johnson-Motoyama, & Kepple, 2014).

Summary of Findings

The current state of the literature emphasized the presence of a positive relationship between parental substance use and several child maltreatment outcomes (i.e., general maltreatment, physical abuse, neglect). As a whole, the extant literature creates a disjointed understanding of what this positive association between parent substance use and child

maltreatment means in a world where substance use behaviors are complex and varied. The large majority of studies operationalized substance use in limited ways, such as (a) dichotomous variable for any current use of alcohol or drugs, (b) dichotomous variable for current problematic use (e.g., heavy drinking/illicit drug use), or (c) dichotomous variable for current substance use disorder. Of these, the most compelling evidence exists for the relationship between current substance use disorder and child maltreatment behaviors. However, findings from these studies do not help us to fully understand what types of substance use behaviors increase risk for maltreatment behaviors—Is it just substance use disorder that matters, or do other use behaviors matter when isolated from substance use disorder? A few studies provided preliminary evidence that different drinking patterns matter for physical abuse frequency and supervisory neglect (Freisthler, Holmes, & Price Wolf, 2014; Freisthler, Johnson-Motoyama, & Kepple, 2014) and that maternal frequency of intoxication matters for physical abuse (Berger, 2005). However, no study provided explicit insight about (a) how specific non-SUD patterns of alcohol and illicit drug use behaviors are associated with child maltreatment behaviors and (b) whether differential risk exists for maltreatment by intensity of use along the continuum for both alcohol and illicit drug use behaviors.

Among types of child maltreatment, general maltreatment is the most extensively studied, followed by physical abuse and then neglect. Emotional abuse has rarely been studied in isolation from other forms of maltreatment; the relationship between parent substance use and emotional abuse remains unclear and would benefit from further exploration. Given the differences in the nature of the acts (i.e., verbal assault, physical assault, inaction) and frequency of behaviors across types, it is also essential to assess how a more nuanced continuum of substance use behaviors may create differential risk, specific to frequency of each type of maltreatment and across types of maltreatment.

Social Support and Child Maltreatment Outcomes

Social Support and Child Maltreatment

As mentioned earlier, parent lack of resources and limited social support providing these resources are conditions that commonly co-occur with parent substance use. Some scholars even argue that these factors may better explain the added risk for child maltreatment behaviors by substance-using parents (Stanton-Tindall et al., 2013; Testa & Smith, 2009; Wells, 2009). Akin to parent substance use being predominantly defined as a risk for child maltreatment, the existing literature has predominantly viewed social support as protective of child maltreatment (Thompson, 2014).

In a meta-analysis of the predominant risk and protective factors within the child maltreatment literature, Stith et al. (2009) observed a robust but small effect of social support for physical abuse (r = -0.18) and for neglect (r = -0.15) with lower social support being associated with higher child physical abuse and higher child neglect. Several studies support this finding by observing total social support to be protective factor for child maltreatment (Berlin, Appleyard, & Dodge, 2011; Bishop & Leadbeater, 1999; Budd, Heilman, & Kane, 2000; Coohey, 1996; Coulton, Korbin, & Su, 1999; Depanfilis & Zuravin, 1999; Freisthler, Johnson-Motoyama, & Kepple, 2014; Li et al., 2011; Rodriguez & Tucker, 2014; Sidebotham, Heron, & Golding, 2002). For general maltreatment, Coohey (1996) observed a negative association between perceived social support (measured by tangible resources, emotional support, and social engagement) and CPS involvement for abuse and/or neglect. Likewise, Bishop and Leadbeater (1999) observed both number and quality of perceived support received from friends was less for parents with a history of CPS involvement. Depanfilis & Zuravin (1999) observed using CPS case records that a higher number of problems across various support systems (i.e., family, friends, informal helping systems) was associated with a significantly higher relative risk for reoccurrence of maltreatment. Coulton et al. (1999) observed significant negative association between social support (measuring structural elements specific to family, friends, and significant

others) and parent self-reported physical abuse and neglect, even after controlling for neighborhood level and individual level risk factors.

Specific to physical abuse, two studies observed a significant negative association between maternal social support and child abuse potential (Budd et al., 2000; Rodriguez & Tucker, 2014). Both studies used measures of satisfaction with supports that could provide resources and socialization. Specific to neglect, Freisthler, Johnson-Motoyama, & Kepple (2014) observed higher social support (using the Interpersonal Support Evaluation List (ISEL) composed of tangible support, emotional support/cognitive aid, and social companionship; Cohen et al., 1985) was associated with a lower likelihood of leaving a child home alone, in an unsafe location, or being unsafely monitored by their parent.

A few studies have not observed a significant relationship between social support and general child maltreatment outcomes (Dubowitz et al., 2011; Kotch, Browne, Dufort, Winsor, & Catellier, 1999). Kotch et al. (1999) used several measures of social support that included several measures of social contact and group participation, structural features of parents' networks, and quality of the mother's relationship with her partner; they observed no main effects for any of the social support measures. Dubowitz et al. (2011) observed no significant relationship between total social support (measured by unspecified types present within the 3 to 6 months prior to baseline) and first CPS report after the baseline interview when controlling for other factors, such as maternal drug use and depressive symptoms. However, this study depended upon a small sample (n = 224 low-income families). These studies used different approaches to measuring social support (i.e., focus on structural features over perceived support, support level after maltreatment occurrence, etc.) than prior studies focused primarily on perceived supports, which may have contribute to difference in findings. In addition, a few studies observed no relationship between social support and physical abuse after controlling for a large number of factors such as demographic variables, family characteristics, parenting variables, and child characteristics (Brown et al., 1998; Yoon, 2013).

Social Support Type and Child Maltreatment

Social support is a multidimensional construct with several functional components that describe connections between people (Cohen, Gottlieb, & Underwood, 2000; DePanfilis, 1996). Recent work has emphasized the complexities of the relationship between social support and child maltreatment outcomes that are not fully being captured by the previously cited literature focused on global measures of social support, such as a distinction between types of social supports (e.g., Coohey, 1996; Freisthler, Holmes, & Price Wolf, 2014; Thompson, 2014). In fact, these prior studies likely conflate two distinct processes: (a) the provision of tangible, informational, or emotional resources in response to a need of aid that the individual perceives to exist, and (b) the interactions and associated consequences that may arise from participation in one or more discrete social groups (Cohen et al., 2000). The former process will be referred to as *resource-based supports* in this dissertation. It is composed of a combination of *tangible supports* (i.e., provision of money, material goods/resources, or behavioral assistance), *emotional supports* (i.e., provision of experiences of being cared for, feeling loved or receiving empathy), and/or *cognitive aid* (i.e., provision of informational resources such as basic knowledge, guidance, or feedback in response to a need for a solution to a problem) (Cohen et al., 2000; DePanfilis, 1996). The latter process will be referred to as *social companionship* in this dissertation. It is often measured by time spent in leisure and participating in recreational activities with others (DePanfilis, 1996; Sherbourne & Hays, 1990).

Resource-based supports. Several child maltreatment studies include global social support as a risk factor, but their measurements focused on social supports that provided some form of tangible, emotional, or cognitive resource (Berlin et al., 2011; Li et al., 2011; Sidebotham & Heron, 2006). Berlin et al. (2011) utilized vignettes where parents identified individuals they could turn to for parenting-related support for tangible, emotional, and cognitive needs; they observed lack of these parenting resources was positively associated with administrative records of child maltreatment occurrence. Li et al. (2011) observed maternal social support—

defined by perceived available tangible, emotional, and cognitive resources—was negatively related to subsequent CPS involvements. Using a large sample (n = 13,174) from the United Kingdom, Sidebotham & Heron (2006) observed CPS involved mothers were more likely to report fewer people providing social support (measured by perceived available tangible, emotional, and cognitive resources) than non-CPS involved mothers.

Other studies intentionally isolated resource-based supports from other types of social support (e.g., Coohey, 1996, 2000; Freisthler, Holmes, & Price Wolf, 2014). Coohey (1996) explored the relationship between past month received tangible supports and emotional supports for mothers with CPS involvement compared to a comparison group of mothers without CPS involvement, using a small community sample (n=300 mothers). Bivariate analyses demonstrated emotional supports were less for the general maltreating group compared to the comparison groups (Coohey, 1996). This same study observed only the number of received emotional resources (measured by emotional support and cognitive aid) were significantly less for CPS involved mothers due to physical abuse compared to non-CPS involved mothers; no association was observed between the number of received tangible supports and CPS involvement for physically abusive mothers. In contrast, she observed that received tangible supports (e.g., child care, housework, money/loan) were less for mothers with a CPS case for neglect compared to mothers with no CPS involvement (Coohey, 1996). Coohey (2000) observed less tangible support and emotional support for physically abusive fathers (measured by CPS substantiation) compared to fathers with no CPS history. Freisthler, Holmes & Price Wolf (2014) observed a negative relationship between both tangible and emotional supports (including measures of cognitive aid) and self-reported measures of physical abuse frequency.

Two studies observed no relationship between perceived resource-based supports and child neglect (Ondersma, 2002; Slack et al., 2004). For neglect, Slack et al. (2004) did not observe a relationship between social support (measures by availability of tangible and emotional supports) and subsequent CPS neglect reports after controlling for a variety of factors

not included in the other studies, such as perceived hardship and parental warmth. Using a small, low-income sample (n = 203), Ondersma (2002) observed perceived social support was lower for neglectful families (measured by CPS substantiation for neglect) compared to non-neglectful families when using bivariate analyses, but perceived social support was excluded in the final model using forward logistic regression procedures that included family substance abuse and negative life events. In addition, actual receipt of tangible resources such as financial assistance and food were positively related with neglect outcomes in one study, possibly due to serving as a proxy for high levels of economic stress (Slack et al., 2011).

Overall, the literature suggests higher *perceived* availability of resource-based supports is associated with lower likelihood of general maltreatment and physical abuse. Although several studies observed that perceived resource-based supports are negatively associated with child neglect, two studies suggests that other explanatory factors may better predict neglect. Receipt of some types of tangible resources may not be associated with general maltreatment and physical abuse outcomes (Coohey, 1996) or positively associated with neglect outcomes (Slack et al., 2011) given that this measure may serve as a proxy for high levels of economic hardship. To my knowledge, no study has specifically assessed the relationship between resource-based supports and emotional abuse.

Social companionship. Recent work has demonstrated that social companionship may not always be protective of child maltreatment behaviors; however, findings across studies are mixed (Coohey, 1996, 2008; Freisthler, Holmes, & Price Wolf, 2014; Lesnik-Oberstein, Koers, & Cohen, 1995). For general maltreatment, only one study using a small sample (*N* = 300) indicated that the number of individuals who provided a mother with companionship was less for mothers with CPS-identified maltreatment (specific to physical abuse and neglect) compared with mothers with no CPS history, suggesting social companionship may be protective of child welfare involvement (Coohey, 1996). However, this study only assessed bivariate comparisons;

studies utilizing larger samples and more robust tests of the relationship between social companionship and child maltreatment are required before any conclusions can be made.

Very few studies have explored the specific relationship between social companionship and abuse outcomes. For example, Freisthler, Holmes and Price Wolf (2014) observed that a higher frequency of physical abuse was associated with a higher number of people providing social companionship and having a higher percentage of one's social companionship support network living within his or her neighborhood. Another study explored bivariate comparisons of emotionally abusive mothers to non-abusive mothers related to social companionship; the study reported that emotionally abusive mothers were less likely to be engaged in social activities than non-abusive mothers (Lesnik-Oberstein, Koers, & Cohen, 1995).

Regarding neglect outcomes, Coohey (1996) observed that social companionship was less for mothers with a CPS case for neglect compared with mothers with no CPS involvement. Specific to supervisory neglect, Coohey (2008) observed that more than 65% of CPS-involved mothers who had more than one type of supervision problem were involved in recreational activities when supervisory neglect occurred. These two studies used varying definitions of social companionship, with the former focused on the *number of persons who provided companionship* and the latter focused on *involvement in recreational activities*.

The limited number of studies suggests parents with more opportunities for recreation may create more opportunities for different types of maltreatment. However, the role of social companionship for child maltreatment remains unclear because of the limited number of studies and mixed results across these studies. Future work would benefit from not only further exploring the role of social companionship in isolation from resource-based supports for child maltreatment but also from exploring when social connections may reinforce deviant behaviors such as child maltreatment rather than protect against them (Baumeister & Leary, 1995; Kawachi & Berkman, 2001; Thompson, 2014).

Summary of Findings

Parent perception of high availability of total social supports is likely to be protective for general maltreatment, physical abuse, and neglect; little is understood about the role of social support in emotional abuse. However, global measures of social support probably conflate two distinct processes associated with social support—provision of resources and social companionship. The few studies that have observed types of social support in isolation from each other indicate the results attributed to total social support may be primarily driven by provision of actual resources. Perceived availability of resource-based supports are typically negatively associated with child maltreatment outcomes. However, the relationship between social companionship and child maltreatment outcomes is not well understood because of a mixed results observed across a limited number of studies. In addition, all but one of the reviewed studies made no distinction between single and repeated occurrences of child maltreatment.

Social Support and Child Maltreatment Within Substance-Using Populations

Social support type has the potential to moderate the relationship between parent substance use and child maltreatment behaviors. For example, the mixed results observed with social companionship in the prior section may be explained by variations in how social supports function with at-risk families (Thompson, 2014, p. 2). Parents with current substance use problems requiring treatment may be more likely to socialize with other high-risk users (Tracy et al., 2012), reinforcing deviant behaviors and contributing to normalized social rituals that increase risk for child maltreatment, such as increased tolerance for the child to be placed in unsafe environments (Zinberg, 1984). In contrast, parents in recovery with a recent history of heavy, prolonged use may have experienced a shift in the composition of social companions to those that facilitate recovery and demonstrate more prosocial behaviors and norms, as observed with 12-step participants (e.g., Kelly, Stout, Magill, & Tonigan, 2011; Nealon-Woods, Ferrari, & Jason, 1995).

For resource-based supports, it is likely that high levels decrease risk of child harm across all groups and are generally protective. That being said, high levels of resources may provide additional protection from harm for children of substance-using parents. These resource-based supports may informally intervene to provide temporary child care, tangible goods, or protective advice for families in a way that buffers children from substance-related harms (Barnard, 2003; Thompson, 2014).

In the extant literature, these potential interactions between substance use and social support in the creation of child maltreatment behaviors are not well understood. A few studies provide insight into how these variables may be related (Kelley, 1998; Taplin & Mattick, 2013; Williams-Peterson et al., 1994), and only one examines these relationships by support type (Freisthler, Holmes, & Price Wolf, 2014). In addition, most of these studies do not help to directly answer how social support may moderate the relationship between parental substance use and child maltreatment outcomes, because they measure these relationships indirectly (e.g., child abuse potential rather than maltreatment behaviors; family contacts rather than perceived types of support).

Using a low-income and working class sample of women recruited from a prenatal clinic, Williams-Peterson et al. (1994) found that drug-using mothers with lower social support had a higher child abuse potential score than comparison mothers; however, this difference was not observed at higher levels of social support. These results suggest social supports at higher levels may minimize the difference in child abuse potential between substance-using and non-substance-using mothers. Using a sample of women in methadone treatment, Taplin and Mattick (2013) observed that having daily contact with one's own parents (compared with no contact) lowered the likelihood of their children being involved with child protective services, suggesting a role of family support shielding children from child welfare involvement. Kelley (1998) observed substance-abusing mothers had a significantly higher level of parenting-related

stress than comparison mothers, suggesting a higher need for resources to mitigate stress associated with child maltreatment behaviors (Rodriguez & Green, 1997; Stith et al., 2009).

For drinking populations, one study suggests different types of social support may affect maltreatment behaviors in different ways. Freisthler, Holmes, and Price Wolf (2014) observed that social support may not always be protective when examining physically abusive behaviors within an alcohol-using population. The study observed that tangible and emotional supports were associated with a lower frequency of physical abuse for alcohol-using parents, whereas social companionship was associated with a higher frequency of physical abuse for alcohol-using parents. They suggested social companionship may contribute to risk for physical abuse when more opportunities for drinking are present.

Summary of Identified Gaps in the Literature

Currently, compelling evidence exists that parent current substance use disorder is associated with child maltreatment outcomes; however, this may be an artifact of how most studies have depended upon single indicator variables highlighting the most extreme end of the continuum of substance use. A few studies suggest that frequency and/or intensity of substance use behavior (limited to alcohol use) may result in differential risk for child harm. However, a more comprehensive understanding of how the full continuum of substance-use behaviors impairs parenting behaviors is needed to provide explicit insight about (a) how specific non-SUD patterns of alcohol and illicit drug use behaviors are associated with child maltreatment behaviors and (b) whether differential risk exists for maltreatment by intensity of use along the continuum for both alcohol and illicit drug use behaviors. In addition, future examinations should be specific to frequency of each type of maltreatment and across types of maltreatment given the differences in the nature of the acts (i.e., verbal assault, physical assault, inaction) and frequency of behaviors across maltreatment types.

It is possible that other factors, such as social support, may better explain the concerning number of families impacted by substance use in the child welfare system. In fact,

the preponderance of studies assessing global social support and child maltreatment indicated social support is protective for child maltreatment. That being said, studies assessing social support by type (i.e., resource-based supports versus social companionship) indicate a less straight-forward relationship. Studies suggest that resource-based supports are most likely to be protective of child maltreatment but results observed with social companionship are mixed. There is some preliminary evidence that social companionship may even have the potential to exacerbate risk and would benefit from further study.

It is also likely that social support moderates the relationship between parent substance use and child maltreatment behaviors. In fact, the exploration of the interaction between substance-use behaviors and social companionship may also help to address mixed findings by examining whether the relationship between social companionship and child maltreatment differs by parent substance-use behavior patterns. The extant literature suggests social support may have a larger effect for substance-using population, but most of these studies do not help to directly answer how social support may moderate the relationship between parental substance use and child maltreatment outcomes due to: (a) use of outcomes associated with child maltreatment (i.e., parenting-stress), (b) focus on global social support rather than specific types of support, and (c) focus on only alcohol-using or drug treatment populations. Future studies would add to the literature by focusing explicitly on how type of social support are associated with child maltreatment behaviors among substance-using parents.

The current literature is also limited in how it has operationalized child maltreatment when examining its relationship to both substance use and social support. The predominant literature has focused upon occurrence of at least one instance of maltreatment; however, increasing neuropsychological impairments associated with more heavy and problematic substance-use behaviors may result in different frequencies of maltreatment behaviors and expose some children to more opportunities for harm. While several studies have examined how substance use and social support are related to physical abuse and neglect, very little work

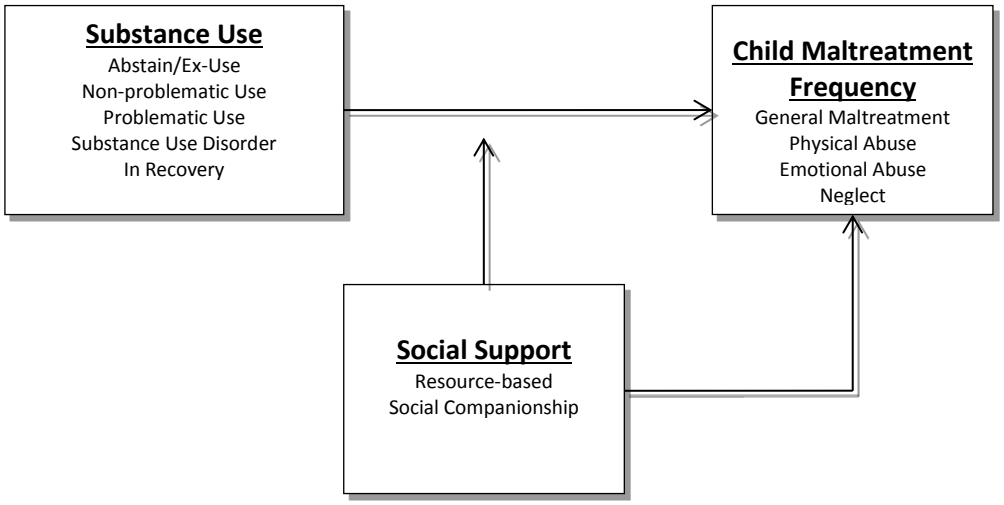
has focused on emotional abuse. It is likely that physical abuse, emotional abuse, and neglect are the result of slightly different processes that are associated with different patterns of parent behavior and would benefit from being explored in conjunction with and separate from each other.

CHAPTER 3: CONCEPTUAL FRAMEWORK

Overview of Conceptual Model

The social information processing model of abuse and neglect provides a framework to theorize how parent neuropsychological functioning influences parenting behaviors (Crittenden, 1993; Milner, 1993, 2000). More importantly, social information processing models suggest that neuropsychological impairments (though substance-use behaviors) can contribute to the creation of maltreatment behaviors (Milner, 1993). Figure 1 shows the conceptual model that guided this dissertation study.

Figure 1 Conceptual Model



This study assessed the relationships between parent substance use behavior patterns and general maltreatment frequency. The hypothesized relationships were guided by the current literature on how substance-related neuropsychological impairments are associated with each substance use behaviors pattern (e.g., Fernandez-Serrano et al., 2011; Fillmore, 2012); however, neuropsychological impairments were not measured. Abstainers and ex-users are likely to have no substance-related maltreatment risk, and non-problematic users are likely to have only a low substance-related abuse risk due to moderate levels of disinhibition. In

contrast, child exposure to acute effects associated with problematic use is likely to create a moderate risk for maltreatment, given the related impairments remaining limited to specific windows of time. Exposure to parent substance use disorder is likely to contribute to an even higher frequency of abuse and neglect because of the pervasive and long-lasting nature of these neuropsychological impairments aligned with all stages of social information processing.

The direct effects of alcohol and drug use alone do not dictate the individual's experience and subsequent substance-related consequences because of many other factors that are likely to moderate these effects (Zinberg, 1984). The types of social supports may play a role in mitigating or exacerbating the effects of parent impairments in social information processing (Milner, 1993). Specifically, resource-based social support may directly alter parenting behaviors that place children at risk for harm and indirectly alter social information processing through reduced stress, guidance in decision making, or altering beliefs/norms influencing choice options (Cohen & Wills, 1985); however, it is less likely that social companionship will equally be beneficial to the provision of resources and may even increase the likelihood of neglect behaviors.

For parents with substance use patterns associated with neuropsychological impairment, the presence of resource-based supports may matter more for the reduction in child maltreatment risk than for parents with substance use patterns associated with little to no impairments. In contrast, the presence of social companionship may promote a risk for abusive and neglectful behaviors, particularly for current substance-using populations. Thus the relationship between parent substance use and child maltreatment behaviors is likely not to occur in isolation but rather is in reaction to or response from others within one's network.

Social Information Processing Models of Abuse and Neglect

In separate lines of research, Milner (1993, 2000) and Crittenden (1993) applied cognitive theories of neuropsychological functioning to develop social information processing (SIP) models for child abuse and neglect, respectively. Both approaches define social

information processing by four sequential stages: (1) attention, (2) interpretation, (3) decision-making, and (4) implementation. Impairments at any stage can contribute to the development of abuse or neglect behaviors.

Milner (1993, 2000) detailed the SIP case for abuse. Parents may develop a skewed perspective of the child's behavior if they: (a) only attend to misbehavior, (b) interprets behavior as threatening, (c) selects abusive behaviors when behavioral response options are limited or mitigating contextual factors for a specific situation are ignored, or (d) implement an abusive responses if self-regulation is compromised. For example, a parent punishes a child for spilling a cup of juice. Abuse may occur if: (1) the parent only observes the child laughing afterwards but not the struggle with the cup beforehand (*attention*); (2) the parent interprets the event as intended by the child rather than accidental (*interpretation*); (3) the parent decides he/she should at least threaten to hit the child with a wooden spoon in order to "correct" the behavior (*decision-making*); or (4) the parent decides to hit the child lightly on the back of his/her legs but fails to control his/herself when actually hitting the child (*implementation*). Social information processing models emphasized earlier stages of attention and interpretation matter for abuse only when distortions in perceiving a child's behavior are present. In contrast, later stages of decision-making and implementation may matter most for acts of commission due to multiple factors that contribute to impairments in these stages (Milner, 1993). For decision-making, abusive responses could arise from inadequately integrating situational information that helps a parent to select an appropriate response and/or from the presence of limited parenting skills or knowledge. Parents may also have a limited ability to adequately implement chosen response due to lack of skills or due to an inability to monitor and modify the magnitude of the response (Milner, 1993).

Crittenden (1993) parallels this approach when applying SIP to neglect. Parents may: (a) fail to notice or notice and fail to respond to a child's communication for help, (b) interpret or evaluate the signal as not severe enough to require a response, (c) have limited response

options and/or believe he or she is not responsible for or incapable of implementing any given response, or (d) may be distracted before being able to implement a decision by a competing need. For example, a child cries incessantly as s/he has developed diaper rash from being left in soiled diapers. This may arise because: (1) the parent may not notice that the child is crying (*attention*); (2) the parent may dismiss the crying as "fussiness" rather than a cry for help (*interpretation*); (3) the parent may recognize the child's diaper is soiled but decide to change it later to make it last longer (*decision-making*); or (4) the parent may have intended to change the diaper but got distracted (*implementation*). Of these stages, Crittenden (1993) emphasized that earlier stages of how a parent perceives and interprets a child's behavior are critical to understanding why parents fail to act. It may be that these early stages are critical to the development of parental empathy (i.e., parent's ability to accurately interpret, understand, and share the feelings of a child), which is compromised when there are deficits in these beginning stages of social information processing (De Paul & Guibert, 2008).

In other words, parent neuropsychological functioning (defined by interrelated cognitive and emotional processing abilities) influences parenting behaviors. First, responding to a child's behavior typically requires executive control functions within the brain, such as attention to the behavior, understanding the context of the behavior (e.g., a child hits sibling, but additional information is needed to identify if behavior is accidental or purposeful), and making novel adjustments in the parent's behaviors (Crittenden, 1993; Miller & Cohen, 2001; Milner, 1993, 2000). Damage to the brain is likely to result in impairments to one or more of the following higher cognitive function important for SIP stages: attention, planning, working memory, cognitive flexibility, judgment, problem solving, decision making; and inhibition/self-regulation (Fuster, 2008; Miller & Cohen, 2001). Second, no decision is purely rational or emotional but rather an integration of the two (Fuster, 2008). Along these lines, how parents process emotion information (i.e., nonverbal or verbal) conveyed by children is likely to play a critical role in the attention to and interpretation of child behaviors (De Paul & Guibert, 2008; Milner, 2003; Seng &

Prinz, 2008). For example, when a parent interprets a child's behavior as threatening, this interpretation (stage 2) can trigger an automatic behavioral response, where the parent may bypass the decision-making stage (stage 3) and go straight to the implementation stage (stage 4) using previously learned behaviors, which often results in more extreme response to a child's behavior (e.g., assault or disengagement) (De Paul & Guibert, 2008; Milner, 1993). Alternatively, parents' impairments in emotion regulation due to high levels of disinhibition or of impulsivity may influence processes associated with stage 3 and stage 4—reasoning, decision making, and implementation of parenting behaviors (De Paul & Guibert, 2008; Milner, 1993).

Substance use may impair neuropsychological functioning, either through producing neuropsychological deficits or exacerbating already present neuropsychological deficits. Low levels of social support, as defined by limited number of social connections providing resources or companionship, may also exacerbate impairments in SIP, especially when parents have limited access to resources that can protect children from harm (Milner, 1993, 2000). The following discussion will focus on how substance use and social support affect how a parent processes a child's behavior.

The Role of Substance-Related Impairments in Social Information Processing

Psychoactive substances (e.g., alcohol, other central nervous system [CNS] depressants, CNS stimulants, and opioids) have generalized effects (e.g., generally sedative or stimulating sensations) that impair or lessen cognitive and emotional processing important for completing general behavioral tasks such as caring for a child (see Cohen, 2010, and Fernandez-Serrano et al., 2011, for comprehensive review). Table 1 summarizes substance-related neuropsychological impairments known or proposed in the literature to be associated with each substance use behavior pattern. In addition, the table details the specific SIP stages that these impairments overlap with and associated risk for child maltreatment behaviors. The following sections will discuss this information in more detail to elucidate how each substance use behavior patterns may differentially contribute to child maltreatment risk.

Table 1 Substance Use Behavior, Neuropsychological Impairment, and Child Maltreatment Risk

Substance Use Behavior	Neuropsychological Impairments	SIP Stage	Child Maltreatment Risk
Abstain/ex-use	No substance-related impairments.	None	No substance-related risk
Non-problematic use	No ongoing impairments Low levels of temporary disinhibition may be present	Implementation	General Mltx: Low risk due to decreased disinhibition Abuse: Low risk due to decreased disinhibition Neglect: No substance-related risk

Problematic use	No ongoing impairments
	
	Temporary impairments due to acute intoxication and withdrawal:
	- Reduced executive control
	  - Attention problems
	  - Poor decision making
	  - Disinhibition
	- Altered emotional processing
	  - Misinterpret emotional cues
	  - Emotional dysregulation (e.g., increased hostility/aggression)
		Attention
		Interpretation
		Decision-Making
		Implementation
			General Mltx: Moderate risk due to temporary impairments—timing of impairments must align with child being in parent care
			
			Abuse: Moderate risk due to temporary impairments in decision making, inhibition, and emotion regulation
			
			Neglect: Moderate risk due to temporary impairments in attention and interpretation

Substance use disorder	Ongoing impairments due to chronic use:
	- Cognitive processing
	  - Attention problems
	  - Impaired novel problem solving
	  - Poor decision making
	- Altered emotional processing
	  - Not attending to and misinterpreting emotional cues
	  - Emotion dysregulation
	
	Temporary impairments due to acute intoxication and withdrawal (same as listed under *problematic use*)
		Attention
		Interpretation
		Decision-Making
		Implementation
			General Mltx: High risk due to higher likelihood of both temporary and ongoing impairments
			
			Abuse: High risk due to higher likelihood of both temporary and ongoing impairments in novel problem solving, decision making, and emotion regulation
			
			Neglect: High risk due to higher likelihood of both temporary and on-going impairments in attention and interpretation of emotional cues

In recent recovery	Persisting impairments due to recent chronic use: - Working memory problems - Disinhibition No substance-related impairments for non-users in recovery Low levels of temporary disinhibition for light/moderate drinkers in recovery	Decision-Making Implementation	General Mltx: Moderate risk due to pervasive impairments Abuse: Moderate risk due to pervasive impairments in working memory and disinhibition Neglect: Moderate risk due to pervasive impairments in working memory

Substance Use Patterns with No to Low Risk for Child Maltreatment

Parents who are either lifetime abstainers from alcohol and drugs or ex-users with no SUD history within the past 4 years are likely not to have any substance-related risk for maltreating their children because they have not used substances that impair neuropsychological functioning. Non-problematic users (defined by light or moderate drinking with no illicit drug use and no recent history of SUD within the past 4 years) have low substance-related risk for maltreating their children because their alcohol intake is likely not enough to result in acute intoxication or withdrawal. Lower levels of alcohol intake may result in some desirable effects such as euphoria, relaxation, and mild disinhibition associated with alcohol as a "social lubricant" (Maldonado, 2010; Oscar-Berman & Marinkovic, 2007). However, mild disinhibition may produce a low level of risk for abuse behaviors in particular, given that impairments related to the later stage of implementation can result in a higher likelihood that parents act upon initial impulses (Matusiewicz, Macatee, Guller, & Lejuez, 2013; Milner, 1993, 2000). Preliminary research evidence supports this rationale with one study observing non-problematic substance use behaviors were associated with a higher physical abuse frequency (Freisthler, Holmes, & Price Wolf, 2014).

Substance Use Patterns with Moderate to High Risk for Child Maltreatment

Problematic use. Parents who are problematic users are defined by reporting current heavy drinking and/or illicit drug use that place them at high risk for experiencing substance-related problems but not meet criteria for a substance use disorder. Although pervasive neuropsychological impairments are not likely for problematic users because they are not engaging in heavy, prolonged substance use, this group will experience acute effects of psychoactive substances that arise from intoxication and/or withdrawal, are time limited (ranging from minutes to days), and impair functioning to some extent through reducing executive control and altering emotional processing (Center for Substance Abuse Treatment, 2005; Cohen, 2010;

Fernandez-Serrano et al., 2011; Hoaken & Stewart, 2003; Maldonado, 2010; Oscar-Berman & Marinkovic, 2007; Vik, Cellucci, Jarchow, & Hedt, 2004).

Acute intoxication of alcohol and drugs may increase the likelihood of maltreatment behaviors through temporary impairments in parent alertness, attention, judgment, decision-making abilities, and disinhibition (Center for Substance Abuse Treatment, 2005; Cohen, 2010; Fernandez-Serrano et al., 2011; Maldonado, 2010; Vik et al., 2004). Impairments in alertness and attention can also result in easier distractibility that results in a child's behavior (e.g., crying or asking for help) not being fully processed by the parent, resulting in a higher likelihood of neglect (Crittenden, 1993). Impairments in attention can also result in incomplete information being perceived by the parent, placing a child at risk for abuse if the behavior is perceived out of context. In addition, impaired judgment and decision making that occurs when a person is drunk or high on drugs increase risk for child abuse by limiting a parent's ability to identify the most appropriate responses to a child's behavior (Milner, 1993, 2000). Finally, disinhibition may impair a parent's ability to self-regulate during implementation of acts. For example, a decision to scold a child can escalate to belittling and threats of harm, or a decision to use corporal punishment can escalate to excessive force and bodily harm.

Child maltreatment risk is also increased from impaired emotional processing and emotion dysregulation associated with alcohol and other drug intoxication and/or withdrawal (Fillmore, 2012; Hoaken & Stewart, 2003; Maldonado, 2010; Milner, 1993, 2000; Oscar-Berman & Marinkovic, 2007; Vik et al., 2004). Specifically, impaired emotional processing can easily result in misinterpretation of a child's behavior. As a result, a benign behavior can be viewed as threatening or aggressive and result in an incongruent aggressive response. Alternatively, a parent may minimize a child's distress and temporarily diminishing parental empathy towards the child, increasing the likelihood of neglect (Milner, 1993; De Paul & Guibert, 2008). Dysregulated emotional states can also increase the likelihood of maltreatment. For example, higher levels of hostility and aggression associated with disinhibition from alcohol intoxication

can contribute to abuse behaviors. Acute withdrawal from some substances can contribute to depressed states which may decrease parent motivation to respond to a child and subsequently increase the risk for neglect. Acute withdrawal can result in temporary but longer-lasting impairments in emotional processing such as anxious moods or irritable and agitated states (Baydala, 2010; Center for Substance Abuse Treatment, 2005; Cohen, 2010; Maldonado, 2010; Oscar-Berman & Marinkovic, 2007; Shah, Vankar, & Himanshu, 2010). Of these, agitated states (defined by an emotional state with high levels of physiological arousal) may increase the likelihood of a parent's interpretation of a child's behavior as threatening and increase the likelihood of abusive parenting responses (Milner, 1993).

Despite the potential severity in neuropsychological functioning, it is important to emphasize the time-limited nature of acute effects. Intoxication and/or withdrawal align with constrained windows of time when parents would experience substance-related impairments in social information processing. As a result, these impairments may pose risk to children only if they are exposed to their parent during these brief windows of time, thus mitigating the frequency of the behavior. In other words, children are at most harm when parents are using alcohol or other drugs or immediately after use when they are recovering (e.g., hangovers). This timing issue may help to explain inconsistencies for problematic use observed within the child maltreatment literature (e.g., Widom & Hiller-Sturmhofel, 2001).

Substance use disorder. Parents reporting current heavy drinking and/or illicit drug use with a recent history of substance-related problems in functioning are more likely to experience *pervasive* neuropsychological impairments from prolonged, heavy use (particularly for polysubstance use) observed with substance use disorders. Pervasive is defined as impairments persisting beyond acute effects of intoxication and withdrawal. Specifically, this group is associated with long-lasting impairments in cognitive processing (e.g., attention, novel problem solving, decision making) and emotional processing (e.g., attending to and interpreting emotional cues, emotion regulation) in addition to acute effects of intoxication and withdrawal

(Breggin & Cohen, 1999; Fals-Stewart & Bates, 2003; Fernandez-Serrano, 2011; Oscar-Berman & Marinkovic, 2007; Vik et al., 2004).

Child abuse behaviors is most likely to be associated with impairments in novel problem solving, decision making, and emotion regulation for similar reasons as detailed with problematic users related to acute intoxication and withdrawal (Breggin & Cohen, 1999; Fals-Stewart & Bates, 2003; Fernandez-Serrano, 2011; Oscar-Berman & Marinkovic, 2007; Vik et al., 2004). Despite these similarities, chronic effects are more pervasive and longer lasting and pose a greater risk of child exposure to parent impairments in social information processing, in which could result in a higher frequency of abuse behaviors (Fernandez-Serrano, 2011).

Neglect may also arise from chronic effects, such as impairments in cognitive processing specific to attention, novel problem solving, and decision making or impairments in emotional processing specific to attending to and interpreting emotional cues (Breggin & Cohen, 1999; Fals-Stewart & Bates, 2003; Fernandez-Serrano, 2011; Oscar-Berman & Marinkovic, 2007; Vik et al., 2004). The longer length of time these impairments last creates more opportunity for a child's behavior to remain unnoticed, and for neglect to occur. Impairments in novel problem solving and decision making can result in parents continually identifying limited responses to address a child's need (Crittenden, 1993). Parents many also be frustrated by difficulty in finding a reasonable solution to the point that he or she defaults to minimal or no response (Crittenden, 1993; De Paul & Guibert, 2008). Impaired decision making can also create conditions that increase risk for neglect. For example, pervasive impairments in decision-making processes regarding parenting responsibilities can decrease the amount of time and tangible resources available for a child through direct (e.g., spent money on alcohol rather than food) and indirect (e.g., missed paid work opportunity) processes, which increases the risk for neglect through not meeting a child's basic needs. These mechanisms align with observations within the extant literature that consistently observed substance use disorder to be associated with child neglect

behaviors (e.g., Brown et al., 1998; Chaffin et al., 1996; Dube et al., 2001; Kelleher et al., 1994; Ondersma, 2002; Sedlak et al., 2010; Slack et al., 2011).

Recent recovery. An emerging area of research suggests that neurological damage from chronic and high-intensity substance use may impair executive control (particularly deficits in working memory and increased disinhibition) for past users who have recently become abstinent, with lasting effects ranging from several months up to 4 years (Barker, Greenwood, Jackson, & Crowe, 2004; Bolla, Funderburk, & Cadet, 2000; Fein, Torres, Price, & Di Sclafani, 2006; Fernandez-Serrano et al., 2011; Garavan et al., 2013; Gansler et al., 2000; Sullivan, Rosenbloom, Lim, & Pfefferbaum, 2000; Janke van Holst & Schilt, 2011). The evidence highlights that impairments in social information processing would be more likely for individuals in recovery with a recent history (i.e., < 4 years) of prolonged, heavy use observed with substance use disorders compared with individuals who may have had substance use in the past without problems or had a distal experience with a substance use disorder. For this group, there is a moderate risk for general maltreatment, abuse, and neglect from enduring impairments without the presence of current acute effects of intoxication and withdrawal. These trends suggest persisting chronic effects post-abstinence may be associated with ongoing risk for abusive behaviors because of compromised self-regulation and greater impulsivity (Janke van Holst & Schilt, 2011).

In contrast, persisting impairments in working memory may contribute to neglectful behaviors, or acts of omission. Impairments in working memory can make it difficult for a parent to hold onto information long enough to integrate important information needed to accurately identify the child's need or to focus on a task long enough to follow through on any given parenting response (Crittenden, 1993; Fuster, 2008). These persisting impairments may help explain previous child maltreatment findings that children of parents with past (but not current) substance use histories were more likely to experience a new occurrence of neglectful behaviors (e.g., Chaffin et al., 1996).

The Role of Social Support in Social Information Processing

Milner (1993) also indicated that limited social connections may exacerbate the conditions related to impaired parent social information processing, especially when it limits a family's access to resources that can protect children from harm. Belsky (1984) suggests that social support promotes parental functioning by providing resources and defining social expectations (e.g., guidance about what is and is not appropriate parenting behavior). These supports may directly mitigate child harm that can arise from impaired parent functioning, such as making sure a child is fed and bathed during times when a parent is incapacitated due to being chronically sick or high from drug use (Belsky, 1984, 1993; Cohen & Wills, 1985). Alternatively, the availability of supports may also influence parent functioning by decreasing distress and/or buffering stress (Belsky, 1984, 1993; Bronfenbrenner, 1986; Cohen & Wills, 1985; Rodriguez & Tucker, 2014). Specifically, supportive contacts can decrease stress and the resulting psychological distress that interferes with perceiving one's environment or others' actions (e.g., threat-related neural activation), a parent's ability to solve problems effectively, and/or a parent's ability to regulate his or her emotions (Goodman et al., 2013; Hostinar, Sullivan, & Gunnar, 2014; Raio et al., 2013; Taylor, 2011), all of which can compromise a parent's ability to accurately process and to appropriately respond to a child's behavior. Different types of social supports may vary in the way they help, hinder, or are indifferent to maltreating parenting behaviors.

Resource-Based Supports

The provision of resources increases both physical and cognitive options that can compensate for or improve parent functioning in a way that protects children from harm. For example, individuals providing tangible supports can act as a substitute caregiver, ensuring that basic needs of a child are met when a parent is unable to meet those needs for a variety of reasons (i.e., work responsibilities, illness, hungover, etc.; DePanfilis, 1996). Resources can be essential for later stages of decision-making and implementation, contributing to a lower risk for

abusive behaviors, in particular. For example, emotional support and cognitive aid are likely to influence parenting behaviors directly through advice and guidance that can reinforce what is and is not appropriate parenting behavior (Belsky, 1993). However, this influence assumes that the individuals within one's network are providing constructive advice and that those using psychoactive substances will help be helped by such advice (Cohen et al., 2000; Thompson, 2014). Some types of resources may be limited in their effectiveness depending on the parent's current level of functioning (e.g., a parent who is currently drunk or high may not be able to hear or to implement the advice or guidance).

Social Companionship

Social companionship has a less straightforward relationship with child maltreatment behaviors. Social companionship may provide social contacts that buffer stress experiences through providing feelings of belonging, resulting in potential improvements in neuropsychological functioning (Cohen et al, 2000; Goodman et al., 2013; Hostinar et al., 2014; Raio et al., 2013; Taylor, 2011). However, it also poses risks for increased socialization away from the family (Coohey, 2008; Warde et al., 2005). As a result, social companionship can influence SIP through distraction from attending to a child's needs, which increases risk for neglect. Social groups also can place pressure upon parents to conform to group norms to secure these connections (Baumeister & Leary, 1995; Kawachi & Berkman, 2001). Whether or not these group norms are protective of child maltreatment depends on the nature of the beliefs; groups norms that reinforce abusive parenting practices increase risk for maltreatment through priming parents to select more aggressive responses to a child's behavior (Baumeister & Leary, 1995; Belsky, 1993). Thus the context of these supports becomes essential to understanding the potential protective or harmful nature of these relationships for child maltreatment behaviors.

The Interaction of Substance Use and Social Support

As detailed earlier, substance use behavior patterns are more likely to create or exacerbate impairments in social information processing (compared with those parents with use

patterns not likely to affect SIP). Thus substance-using parents may exhibit a higher need for resources to buffer children from substance-related impairments in social information processing. The extant literature suggests that the availability of resource-based supports appears to be generally protective (e.g., Berlin et al., 2011; Freisthler, Holmes, & Price Wolf, 2014; Li et al., 2011; Sidebotham & Heron, 2006). However, the presence of resources to protect children may become even more important as impairments in parent neuropsychological functioning become more prevalent. Specifically, resource-based supports may buffer children from the harms of parent intoxication and withdrawal (Barnard, 2003). For example, tangible supports such as child care or having someone to transport a child can reduce abusive and neglect behaviors by limiting child exposure to time-limited effects of intoxication and withdrawal. Similarly, these supports could provide substitute supervision when parents cannot actively attend to a child's needs (e.g., during a night of binge drinking). In addition, poor decision-making resulting from chronic effects of substance use may take time and/or tangible resources (e.g., money) away from meeting the child's needs (Barnard & McKeganey, 2004). These needs can be supplemented through provision of resources from identified supports. In cases of acute intoxication and withdrawal, these supports would have to be present only during these times of impairments; however, higher levels of resources may be required to address more pervasive impairments associated with substance use disorder.

A large network of recreational friends and/or acquaintances could influence parenting norms for either better or worse depending on the composition of this network (Belsky, 1993; Zinberg, 1984). For parents reporting current substance use disorder, more people who provide social companionship can result in socializing with a network that is more likely to be composed of other substance users and engaged in risky and harmful behaviors (Galea, Nandi, & Vlahov, 2004; Rice, Milburn, & Monro, 2011; Wills & Vaughan, 1989). In this context, parent impairments in decision making and self-regulation may be reinforced and increase the risk for abusive or neglectful responses to child behaviors. For example, parents with current harmful

substance use patterns may socialize with individuals whose social information processing may be equally compromised due to their own substance use. These individuals may reinforce each other's behaviors, such as deciding, after a late-night house party, that it is safe to leave half-filled cups of alcohol in a room where a small child will be playing the next morning. The reinforcement of these behaviors can result in a subtle downward leveling of norms, such as increased tolerance for the child to be placed in unsafe environments or to be left unsupervised. In contrast, ex-users with a recent history of heavy, prolonged use may have experienced a shift in the composition of social companions to those that facilitate recovery and demonstrate more prosocial behaviors and norms, as observed with twelve-step participants (e.g., Kelly, Stout, Magill, & Tonigan, 2011; Nealon-Wood, Ferrari, & Jason, 1995). Social groups with these types of prosocial behaviors may reinforce responses that address child behaviors with non-violent means and that prioritize meeting a child's needs.

Summary

In sum, drug use may be expected to negatively impact SIP either through producing neuropsychological deficits or exacerbating already present neuropsychological deficits, resulting in a higher likelihood of maltreatment (Milner, 1993). This chapter identified more recent evidence of impairments associated with a range of substance use behaviors that supports this argument. Abstainers and ex-users of alcohol and drugs are associated with no substance-related impairments and consequently no added risk for child maltreatment. Non-problematic use is associated with low levels of disinhibition with may result in a low risk for child abuse behaviors. Parent problematic use is associated with less risk for child maltreatment than parent substance use disorder, given the former is limited to times of acute intoxication and/or withdrawal while the latter is associated with pervasive and long-lasting neuropsychological impairments. Parents in recovery may have added but diminishing risk for child maltreatment due to persisting impairments in disinhibition and working memory that can last anywhere from several months to four years.

The direct effects of alcohol and drug use alone do not dictate the individual's experience and subsequent substance-related consequences due to many other factors likely moderating these effects, such as types of social support (Zinberg, 1984). Specifically, resource-based social support may directly compensate for parenting behaviors that place children at risk for harm and indirectly alter social information processing through reduced stress, guidance in decision-making, or altering beliefs/norms influencing choice options (Cohen & Wills, 1985). However, it is less likely that social companionship will be equally beneficial to provision of resources and may even increase likelihood of maltreating behaviors, through added distraction and potential influence on decisions for more aggressive parenting responses.

For parents with substance use patterns associated with neuropsychological impairments, the presence of resource-based supports may matter more for the reduction in child maltreatment risk than for parents with substance use patterns associated with little to no impairments. In contrast, the presence of social companionship may promote risk for abusive and neglectful behaviors, particularly for current substance-using populations. Thus the relationship between parent substance use and child maltreatment behaviors is likely to not occur in isolation but rather is in reaction to or response from others within one's network.

Research Questions and Hypotheses

RQ 1: Are parent substance use patterns (i.e., abstainer/ex-user, non-problematic use, problematic use, SUD, and in recovery) associated with frequency of general maltreatment?

H1a: Parents reporting problematic use will have a higher frequency of general maltreatment compared to (a) abstainers/ex-users and (b) non-problematic users.

H1b: Parents reporting substance use disorder will have a higher frequency of general maltreatment compared with (a) abstainers/ex-users, (b) non-problematic users, (c) problematic users, and (d) those in recent recovery.

H1c: Parents reporting being in recent recovery will have a higher frequency of general maltreatment compared with (a) abstainers/ex-users and (b) non-problematic users.

RQ 2: Are parent substance use patterns associated with the frequency of child maltreatment type (i.e., physical abuse, emotional abuse, and neglect)?

Physical Abuse

H2.1a: Parents reporting non-problematic use will have a higher frequency of physical abuse compared with (a) abstainers/ex-users.

H2.1b: Parents reporting problematic use will have a higher frequency of physical abuse compared with (a) abstainers/ex-users and (b) non-problematic users.

H2.1c: Parents reporting substance use disorder will have a higher frequency of physical abuse compared with (a) abstainers/ex-users, (b) non-problematic users, (c) problematic users, and (d) those in recent recovery.

H2.1d: Parents reporting being in recovery will have a higher frequency of physical abuse compared with (a) abstainers/ex-users and (b) non-problematic users.

Emotional Abuse

H2.2a: Parents reporting non-problematic use will have a higher frequency of emotional abuse compared with (a) abstainers/ex-users.

H2.2b: Parents reporting problematic use will have a higher frequency of emotional abuse compared with (a) abstainers/ex-users and (b) non-problematic users.

H2.2c: Parents reporting substance use disorder will have a higher frequency of emotional abuse compared with (a) abstainers/ex-users, (b) non-problematic users, (c) problematic users, and (d) those in recent recovery.

H2.2d: Parents reporting being in recovery will have a higher frequency of emotional abuse compared with (a) abstainers/ex-users and (b) non-problematic users.

Neglect

H2.3a: Parents reporting problematic use will have a higher frequency of neglect compared with (a) abstainers/ex-users and (b) non-problematic users.

H2.3b: Parents reporting substance use disorder will have a higher frequency of neglect compared with (a) abstainers/ex-users, (b) non-problematic users, (c) problematic users, and (d) those in recent recovery.

H2.3c: Parents reporting being in recovery will have a higher frequency of neglect compared with (a) abstainers/ex-users and (b) non-problematic users.

RQ 3: Is perceived social support type associated with frequency of child maltreatment type?[1]

H3a: Parents reporting high number of resource-based supports on average will have a lower frequency of general maltreatment compared with those reporting a low number of resource-based supports on average.

H3b: Parents reporting high number of resource-based supports on average will have a lower frequency of physical abuse compared with those reporting a low number of resource-based supports on average.

H3c: Parents reporting high number of resource-based supports on average will have a lower frequency of emotional abuse compared with those reporting a low number of resource-based supports on average.

H3b: Parents reporting high number of resource-based supports on average will have a lower frequency of neglect compared with those reporting a low number of resource-based supports on average.

[1] All hypothesized relationships are for resource-based supports. There are no hypothesized main effects for child maltreatment frequencies regressed on social companionship.

RQ 4: Does perceived social support type moderate the relationship between parent substance use patterns and frequency of child maltreatment behaviors?

General Maltreatment

H4.1a: The differences in average general maltreatment frequency between problematic users and abstainers/ex-users will be less at a high level of resource-based supports than the differences observed at a low level of resource-based supports.

H4.1b: The differences in average general maltreatment frequency between parents reporting SUD and abstainers/ex-users will be less at a high level of resource-based supports than the differences observed at a low level of resource-based supports.

H4.1c: The differences in average general maltreatment frequency between parents reporting SUD and abstainers/ex-users will be more at a high level of social companionship than the differences observed at a low level of social companionship.

Physical Abuse

H4.2a: The differences in average physical abuse frequency between problematic users and abstainers/ex-users will be less at a high level of resource-based supports than the differences observed at a low level of resource-based supports.

H4.2b: The differences in average physical abuse frequency between parents reporting SUD and abstainers/ex-users will be less at a high level of resource-based supports than the differences observed at a low level of resource-based supports.

H4.2c: The differences in average physical abuse frequency between parents reporting SUD and abstainers/ex-users will be more at a high level of social

companionship than the differences observed at a low level of social companionship.

Emotional Abuse

H4.3a: The differences in average emotional abuse frequency between problematic users and abstainers/ex-users will be less at a high level of resource-based supports than the differences observed at a low level of resource-based supports.

H4.3b: The differences in average emotional abuse frequency between parents reporting SUD and abstainers/ex-users will be less at a high level of resource-based supports than the differences observed at a low level of resource-based supports.

H4.3c: The differences in average emotional abuse frequency between parents reporting SUD and abstainers/ex-users will be more at a high level of social companionship than the differences observed at a low level of social companionship.

Neglect

H4.3a: The differences in average neglect frequency between problematic users and abstainers/ex-users will be less at a high level of resource-based supports than the differences observed at a low level of resource-based supports.

H4.3b: The differences in average neglect frequency between parents reporting SUD and abstainers/ex-users will be less at a high level of resource-based supports than the differences observed at a low level of resource-based supports.

H4.3c: The differences in average neglect frequency between parents reporting SUD and abstainers/ex-users will be more at a high level of social companionship than the differences observed at a low level of social companionship.

CHAPTER 4: METHOD

Secondary Data Analyses: National Survey of Child and Adolescent Well-Being I

I conducted secondary data analyses using the National Survey of Child and Adolescent Well-Being I (NSCAW I). NSCAW I is a national panel survey of children who were identified as being at risk for experiencing child maltreatment due to experiencing a child protective services (CPS) investigation for child maltreatment but not necessarily receiving child welfare services. The original survey includes five waves of data collection obtained from 1999 to 2007 (Biemer, Dowd, & Webb, 2010; Dowd et al., 2008). NSCAW I includes parent self-report of child maltreatment behaviors, substance use behaviors at multiple time points, and social support by type.

Protection of Human Subjects

The original survey obtained written informed consent from adult respondents and written assent from children 7 years and older at Wave 1 (W1), Wave 3 (W3), Wave 4 (W4), and Wave 5 (W5). Wave 2 (W2) obtained informed consent verbally for telephone interviews and in writing for in-person interviews. Staff contacted adult caregivers who had legal guardianship or legal rights to consent for their child's participation (but who were not necessarily the key respondent identified for the caregiver interview). A field representative read the consent form out loud to the respondent before obtaining consent and completing the interview. Respondents completed automated computer-assisted self-interviewing (ACASI) modules to increase privacy when reporting sensitive information such as substance use behaviors and to minimize need for mandatory reporting of child maltreatment behaviors by field interviewers. Research staff at Research Triangle International (RTI) assessed interview responses to determine if a child protective services (CPS) report was required to be filed. To protect participants, the original designers of the study used a tiered data release approach (i.e., general and restricted), given the considerable risk to participants if they were re-identified (Dowd et al., 2008).

NSCAW I Sample Design

NSCAW I used a multi-stage stratified sample design that targeted a nationally representative group of children who were at risk for or had experienced abuse and/or neglect. The first stage divided the United States into nine sampling strata that corresponded to the eight states with the highest CPS caseloads and all other states combined, including the District of Columbia. The second stage included a random selection of counties likely to have larger caseloads as primary sampling units (PSUs) within each sampling stratum. In some cases, randomly selected counties with very small caseloads were combined with adjacent counties. This process resulted in the identification of 92 primary sampling units in 97 counties nationwide. Finally, the study selected children between ages 0 and 14 years from within each PSU, who either (a) received ongoing services from CPS or (b) had not received services but were investigated by CPS from October 1999 to December 2000. The study oversampled infants, sexual abuse cases, and cases receiving services after investigation. Only one child per household was eligible for the study, and a child investigated as a perpetrator of abuse was deemed ineligible (Biemer et al., 2010; Dowd et al., 2008).

The final NSCAW I sample was composed of 6,228 children who were between the ages of 0 and 15 years at the time of first contact. Of these, 5,501 children were investigated by child protective services for abuse and/or neglect between October 1999 and December 2000. These cases included investigations with a range of outcomes from no maltreatment being observed to child removal due to determination of harm to child. Given that all families in the sample had contact with CPS, they were all considered at risk for future child maltreatment (Biemer et al., 2010).

Data Collection Methods

NSCAW I was a field-based study that collected data from children 10 years and older, adult caregivers of the children, caseworkers, teachers, and local agencies. Table 2 details the data collection timeline for the original NSCAW I study conducted between 1999 and 2007.

Study representatives first contacted families by mailing an introductory letter and brochure to their homes followed by telephone contact and/or in-person contact (Dowd et al., 2008). Upon contact at each wave, field representatives identified an adult caregiver as a key respondent if he or she resided with the sampled child for 2 or more months in the past year and was identified as the person who was the "most knowledgeable" about the child and could provide the most accurate information about the child's well-being. Because of this definition, key respondents identified for the caregiver interview may differ across waves. The current study required key respondents to be the same across all waves to construct an accurate history of substance use behaviors within the past 4 years.

Table 2 NSCAW I Data Collection Timeline

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5
Start and end date	11/15/99–04/30/01	10/01/00–03/31/02	04/01/01–09/30/02	08/01/02–02/28/04	09/05/05–11/15/07
Months after baseline measure	0	6–10	12–16	30–34	53–94
Modality	In-person	In-person Phone	In-person	In-person	In-person
Respondent					
Child	X		X	X	X
Current Caregiver	X	X	X	X	X
Caseworker	X	X	X	X	X
Teacher	X		X	X	X
Incorporated into current study	X		X	X	

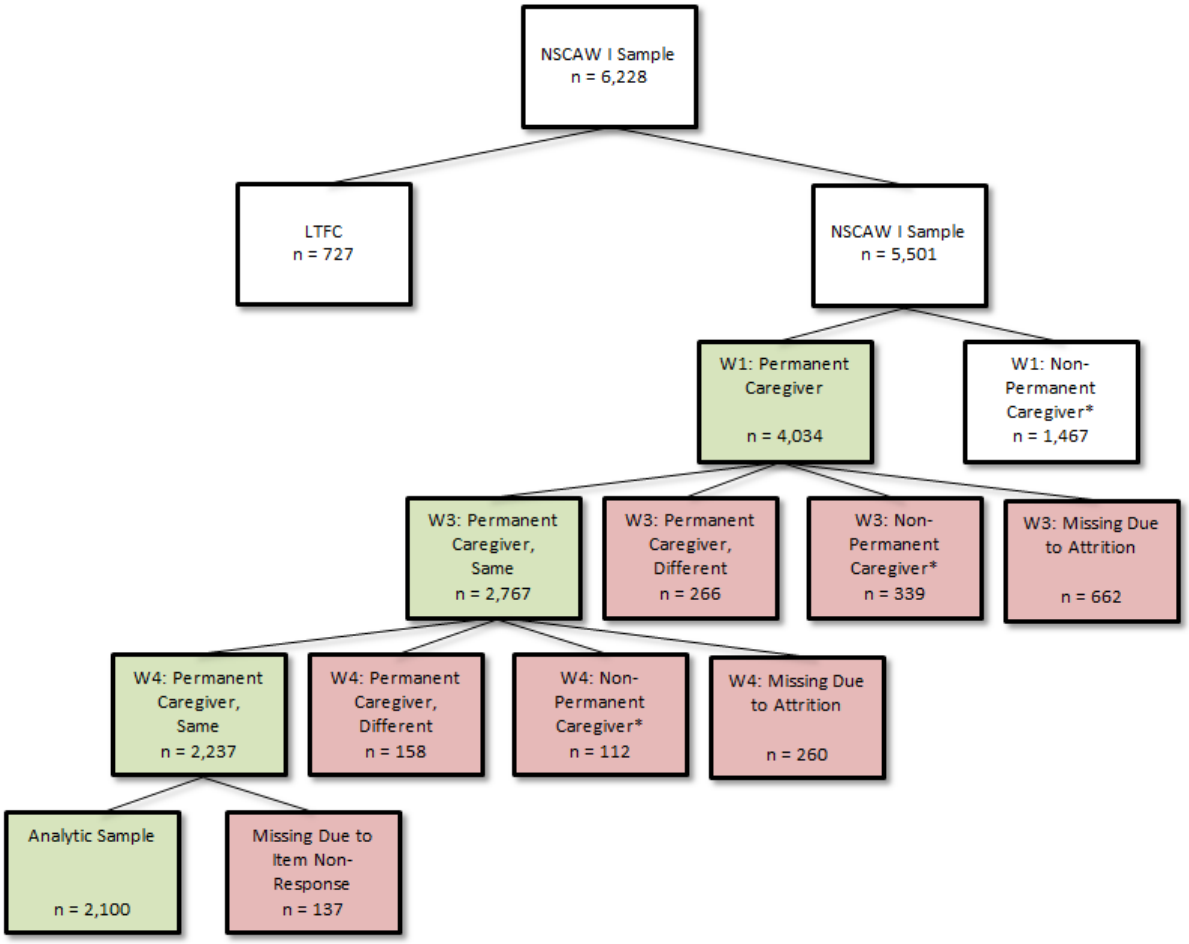
All nonsensitive items were gathered using computer-assisted personal interviewing (CAPI) technology. The study used ACASI procedures with permanent caregivers and older children to collect sensitive information regarding maltreatment, substance use, health, and criminal involvement. This study included information from W1, W3, and W4 caregiver interviews. W2 was excluded because the ACASI items essential to this study were not

collected, and W5 was excluded because of the high variability in timing of interviews and the high number of cases without permanent caregiver responses.

Study Participants

This study used the Child Protect Services sample (*N* = 5,501 at W1), which excludes youths in long-term foster care (LTFC). In order to measure W4 parent substance-use patterns (defined by current and past substance use behavior), the final study sample required all key respondents to be consistent and maintain permanent caregiver status across W1, W3, and W4. Nonpermanent caregivers (*n* = 1,467 at baseline) did not complete any survey items obtained with A-CASI technology (e.g., child maltreatment behaviors, substance use), resulting in their exclusion from the current study. At baseline, the NSCAW CPS sample surveyed 4,034 respondents who were identified as a permanent caregiver of the sampled child. Among these, I identified 2,237 individuals who (a) maintained permanent caregiver status and (b) were likely to be the same key respondent across W1 to W4 based on survey variables that indicated the key respondent reported the same name, birthday, and Social Security number across all identified waves. I removed an additional 137 respondents from the study sample due to incomplete or missing information. The final analytic sample included 2,100 permanent caregivers interviewed at W4 with complete information. Figure 2 shows how I selected the study sample the original NSCAW I sample. Table 3 displays the analytic sample characteristics. Please note that all analytic sample respondents will be referred to as *parents* for the remainder of the study, given that the vast majority of the analytic sample were biological parents and/or legally identified parenting figures (i.e., adoptive parent, step-parent) in the sampled child's life.

Figure 2 Study Sample Selection



*Attrition sample indicated by red; analytic sample indicated by green.

Table 3 Weighted Descriptive Statistics for Study Sample (*n* = 2,100 Parents at Wave 4)

	n	*Weighted %*
Sampled child characteristics		
Child age (years)		
2–5	764	20.3
6–10	607	37.4
11–16	729	42.3
Child gender		
Male	1,029	51.0
Female	1,071	49.0
Parent characteristic		
Age (years)		
< 35	1,240	53.4
35–44	649	35.2
≥ 45	211	11.4
Gender		
Male	111	6.0
Female	1,989	94.0
Race/Ethnicity		
Non-Hispanic White	1,093	52.8
Non-Hispanic Black	559	23.9
Hispanic	334	16.8
Other	114	6.4
Partnership status		
Married / Co-habit	1,021	52.8
Other	1,079	47.2
Relationship to child		
Biological parent	2,016	97.0
Other	84	3.0
Education completed		
Less than high school	606	27.6
High school or more	1,494	72.4
Employment Status		
Employed	1,095	55.4
Unemployed	312	11.2
Other	693	33.4
Household characteristics		
Receipt of govt aid		
No	720	38.4
Yes	1,380	61.6
Number of children < 18 yrs		
1 child	467	21.6
2 children	607	30.8
3 children	540	23.4
4 or more children	486	24.2

Measures

Table 4 summarizes all the study variables, the original scales or questions, waves of data used to construct the variables, and who constructed the final variable used in this study.

Table 4 Variable Construction

Variable Name	Scale / Item	Waves Used	Source
Child maltreatment frequency	Conflict Tactics Scale, Parent Child (Straus et al., 1998)	W4	Kepple
Key independent variables			
Substance use patterns	Composite International Diagnostic Interview-Short Form, Alcohol and Illicit Drug Sections (CIDI-SF; Kessler et al., 1998)	W1, W3, W4	Kepple
Social support type	Social Support Questionnaire (SSQ3; Sarason, Levine, Basham, & Sarason, 1983); Duke-UNC Functional Social Support Scale (Broadhead, Gehlbach, de Gruy, & Kaplan, 1988)	W4	Kepple
Parent risk factors			
Arrest history	Parent self-report of lifetime history of arrest for any offense	W1, W3, W4	NSCAW
Physical health	Short-form Health Survey (SF-12; Ware, Kosinski, & Keller, 1996)	W4	NSCAW
Mental health	Short-form Health Survey (SF-12; Ware et al., 1996)	W4	NSCAW
Prior service and treatment history			
CPS services at baseline	CPS report of case opened at baseline.	W1	NSCAW
Lifetime MH or AOD tx	Parent self-report of any lifetime history of mental health, alcohol, or drug treatment or any recent support group participation.	W1, W3, W4	Kepple
Recent family services	Parent self-report of any recent family counseling, parent skills training, and/or respite child care	W1, W3, W4	Kepple
Demographics			
Child age	Derived variable of child age	W4	NSCAW
Child gender	Derived variable of child gender	W4	NSCAW
Parent age	Recoded parent report of age in years	W4	NSCAW
Parent gender	Recoded parent report of gender	W4	NSCAW
Parent race/ethnicity	Derived variable based on parent report of race and Hispanic origin	W4	NSCAW
Parent married/co-habitating	Parent report of partnership status	W4	NSCAW
Parent education	Recoded parent report of education		NSCAW
Parent employment	Recoded parent report of employment	W4	NSCAW
HH receipt of government aid	Parent self-report of household receipt of any government support by household members	W4	Kepple

Dependent Variables

Child maltreatment was defined as "Any acute disruption caused by the threatened or actual acts of commission or omission to a child's physical or emotional health" that might negatively affect the child's physical, cognitive, or emotional development (Leeb et al., 2008, p. 12). Child maltreatment was measured by the Conflict Tactics Scale – Parent Child (CTS-PC), which has demonstrated construct validity (Straus et al., 1998) and was operationalized as annual frequency of behaviors during the past 12 months reported at W4. Each item was recoded to counts based upon coding instructions provided by Straus (2004): (1) *Never* or *Not in past 12 months, but before* were recoded to 0, (2) *1 time* was kept as 1; (3) *2 times* was kept as 2; (4) Subsequent values *3 to 5 times, 6 to 10 times,* and *11 to 20 times* were recoded to be their midpoints, and (5) *More than 20 times* was recoded to 25. Any case with missing data for one or more items was removed from the analysis. The study used final maltreatment counts constructed from the sum of all selected items to obtain a number of incidents enacted by the key respondent during the prior year. This study operationalizes the CTS-PC annual frequencies as counts of maltreatment events and counts for each type of maltreatment (i.e., physical abuse, emotional abuse, and neglect). As is normal for count data, the distributions were highly right-skewed and zero-inflated and were addressed by this study's selection of analytic models.

The study measured four forms of maltreatment using the CTS-PC: (1) general child maltreatment, (2) physical abuse, (3) emotional abuse, and (4) neglect. General maltreatment included all physical abuse, emotional abuse, and neglect items detailed below. Nonviolent discipline, corporal punishment, and minor psychological aggression items were excluded, given that they represent less severe parenting behaviors that would likely not qualify as meeting the definition of harm selected for this study, and sexual abuse items were excluded because they were not specific to the key respondent. Physical abuse included four severe physical assault items (e.g., *threw or knocked child down*) and four very severe physical assault items (e.g.,

burned or scalded child on purpose); the item for *shook child* was excluded because all of the sample children were older than 2 years during Wave 4 (Straus, 2004). Emotional abuse included three severe psychological aggression items (e.g., *called child dumb or lazy or some other name like that*) that prior studies identified as more severe forms of psychological aggression of a parent towards a child (Straus, 2004; Straus & Field, 2003). Neglect included five items (e.g., *had to leave child home alone*) that covered aspects of supervision, emotional expression of love, provision of food, and provision of medical care (Straus, 2004).

Internal consistency for child maltreatment was $\alpha = 0.58$; physical abuse was $\alpha = 0.43$; emotional abuse was $\alpha = 0.63$; and neglect was $\alpha = 0.47$. The current study's alpha coefficients were similar to or better than those reported by Straus et al. (1998) ($\alpha = 0.55$ for physical assault, including corporal punishment; $\alpha = 0.02$ for severe physical assault; $\alpha = 0.60$ for psychological aggression; and $\alpha = 0.22$ for neglect). The lower internal consistency ($\alpha < 0.70$) is likely due to the focus on items capturing more severe maltreatment behaviors, which are expected to have low internal consistency as these items measure rare events and possess a skewed distribution (Straus et al., 1998). The operationalization of responses as counts can partially address concerns of low internal consistency given that counts have high face validity, result in a ratio scale, and were based on a 12-month time interval (Allison, 1978). As stated earlier, Straus et al. (1998) also provided evidence for construct validity of the CTS-PC. Table 5 shows the weighted descriptive statistics for all dependent variables and non-demographic independent variables.

Table 5 Weighted Descriptive Statistics for Key Variables (*n* = 2,100 Parents)

	n	*Weighted % or Mean(LSE)*	Min	Max
Child maltreatment variables				
Child maltreatment	2,100	6.9 (0.6)	0.0	108.0
Physical abuse	2,100	0.5 (0.1)	0.0	48.0
Emotional abuse	2,100	3.4 (0.3)	0.0	75.0
Neglect	2,100	2.9 (0.4)	0.0	100.0
Substance use patterns				
Abstainer/ex-use	1,099	50.6		
Non-problematic use	455	22.6		
Problematic use	340	17.7		
Substance use disorder (SUD)	130	6.3		
In recent recovery	76	2.8		
Social support				
Resource-based supports				
Low	695	31.0		
Moderate	937	43.8		
High	468	25.2		
Social companionship				
Low	820	38.8		
Moderate	963	45.7		
High	317	15.5		
Parent child welfare and treatment history				
CPS services @ baseline				
No	708	74.8		
Yes	1,392	25.2		
Lifetime mental health / alcohol or other drug treatment				
No	1,350	68.2		
Yes	750	31.8		
Family/parenting services				
No	1,447	72.7		
Yes	653	27.3		
Parent risk factors				
Physical health	2,100	46.6 (0.4)	11.5	66.4
Mental health	2,100	48.8 (0.4)	9.4	66.9
Any history of arrest				
No	1,379	66.1		
Yes	721	33.9		

Substance Use Patterns

Substance use was measured by the Composite International Diagnostic Interview-Short Form (CIDI-SF; Kessler et al., 1998) at W1, W3, and W4. I first created general substance use measures for each wave: (a) drinking patterns, (b) illicit drug use, and (c) alcohol or substance use disorder. These categorical measures for W4 substance use patterns reflected hypothesized effects for varying levels of alcohol and/or drug use. The following discussion provides specific details for each step of the process.

Drinking patterns. For alcohol use, the CIDI-SF asked parents to self-report the largest number of drinks the respondent had in any single day with associated problems in functioning for the past 12 months. The categorical response options for largest number of drinks follow: 1: *None or never drink;* 2: *1-3 Drinks in a day;* 3: *4-10 Drinks in a day;* 4: *11-20 Drinks in a day;* and 5: *More than 20 drinks in a day*. I then recoded these categories into the following drinking patterns derived from previous work (Freisthler, Holmes, & Price Wolf, 2014; Kaufman Kantor & Straus, 1987): (a) no alcohol use (0 drinks at most), (b) light to moderate drinking (1–3 drinks at most), and (c) heavy drinking (4 or more drinks) for W1, W3, and W4. Although one question is not desirable to capture drinking patterns comprehensively, it can be useful for comparative purposes (Dawson & Room, 2000).

Illicit drug use. For drug use, the CIDI-SF asked parents to self-report illicit drug use (*Yes/No*) for the past 12 months. For prescription drugs (e.g., sedatives, analgesics), illicit drug use was captured by use without a doctor's prescription, in larger amounts than prescribed, or for a longer period than prescribed. For nonprescription drugs (e.g., marijuana, heroin), illicit drug use was defined by any use. Specific examples of drug names were provided for each drug type (e.g., *During the past 12 months, did you use analgesics or other prescription painkillers on your own? This does not include normal use of aspirin, Tylenol without codeine, etc., but it does include use of Tylenol with codeine and other prescription painkillers like Demerol, Darvon, Percodan, Codeine, Morphine, and Methadone*). Respondents were asked to

report on current use for the following psychoactive substances: marijuana/hashish, sedatives, tranquilizers, analgesics, heroin, cocaine/crack/ freebase, amphetamines, inhalants, or LSD/hallucinogens. Illicit drug use was categorized into no illicit drug use (0) or any illicit drug use (1) for W1, W3, and W4. The survey based its definition of drug use on WHO standards for illicit use and does not provide information regarding parent non-illicit use of prescription drugs, which also have psychoactive effects (Moncrieff, Cohen, & Porter, 2013).

Substance use disorder. The same substance use–related problems were asked for both alcohol and drug use screener items. If individuals endorsed heavy drinking (i.e., 4+ drinks), they were asked to answer about problem behaviors related to their drinking. If individuals endorsed any illicit drug use, they were asked to answer about problem behaviors related to their general illicit use. The CIDI-SF was designed to capture alcohol and drug dependence based on *DSM-III* criteria (Kessler et al., 1998); however, the focus upon dependence does not capture the full range of potentially problematic use associated with risk based on the review of the extant literature (i.e., traditionally captured by substance abuse). To address this concern and broaden the scope as much as possible, this study used the categorization approach for substance use disorders defined by the *DSM-V* (APA, 2013).

A parent was categorized as having a substance use disorder if they endorsed *two or more* of the following behaviors: (a) interference with work at school, or a job, or at home at least 3 or more times (Criteria A5), (b) under the influence in a situation where one could get hurt (Criteria A8), (c) any emotional or psychological problems from use (Criteria A9), (d) strong desire or urge to drink/use that could one could not keep from drinking/using (Criteria A4), (e) period of 1 month or more when one spent a great deal of time drinking/using or getting over effects of alcohol/drugs (Criteria A3), (f) drank/used more than one intended to or drank/used longer than intended to at least 3 or more times (Criteria A1), and (g) drank/used more than one/used in order to get the same effect (Criteria A10 Tolerance; APA, 2013). The CIDI-SF items appear to align well with this single-factor approach. In addition, studies have observed

the single-factor approach to be an acceptable measure given that it may decrease false positive results when applied to screening measures compared with abuse definitions that required only positive endorsement of one of three specified behaviors (i.e., categories a–c listed above) (Dawson, Smith, Saha, Rubinsky, & Grant, 2012; Hasin et al., 2012; McBride, Teeson, Baillie, & Slade, 2011). Substance-related problems not captured by the current approach include symptoms of withdrawal, persistent desire or unsuccessful efforts to cut down, giving up or reducing other activities because of use, and continued use despite persistent or recurrent social/interpersonal problems associated with use; however, this limitation equally applies to the scale's application to the *DSM-IV-TR* categories of abuse and dependence (APA, 2000, 2013).

Substance use behavior patterns. Two categories were created to capture parent substance use with distinct patterns but no hypothesized impairments associated with child maltreatment risk: (a) Abstain/Ex-use – Parents who reported no alcohol or illicit drug use during W4 AND no substance use disorder during W1 and W3; and (b) Non-problematic use – Parents who only report light or moderate drinking with no illicit drug use during W4 AND no substance use disorder during W1 and W3. One category captures substance use patterns that were more likely to align with hypothesized acute effects of intoxication and withdrawal: (c) Problematic use – Parents who reported heavy drinking and/or illicit drug use during W4 AND no substance use disorder during W1, W3, and W4. Another category captures substance use patterns that were more likely to align with hypothesized chronic effects of heavy and/or prolonged use: (d) Substance use disorder – Parents who reported heavy drinking and/or illicit drug use during W4 AND substance use disorder during W1, W3, or W4. The final category isolates substance use patterns that were more likely to align with hypothesized persisting chronic effects due to a recent substance use disorder: (e) In recovery - Parents who reported no illicit drug use, no alcohol use, or light/moderate drinking only during W4 *and* substance use disorder during W1 or W3.

Social Support

Perceived social support items were adapted from the Social Support Questionnaire (SSQ3; Sarason, Levine, Basham, & Sarason, 1983) and the Duke-UNC Functional Social Support Scale (Broadhead, Gehlbach, de Gruy, & Kaplan, 1988). All questions were collected during W4 and asked respondents to identify how many people could provide a specific type of help or support for them. I created measures for two types of social support: resource-based support and social companionship (Cohen, Mermelstein, Kamarck, & Hoberman, 1985). I calculated an average number of individuals providing resource-based support to the parent, given that the category was composed of a variety of items that were likely to duplicate persons providing support. Each type of social support was categorized into three levels based on the distribution of counts: (a) parents reporting counts 0.5 standard deviations below the mean; (b) parents reporting counts within 0.5 standard deviations of the mean; and (c) parents reporting counts 0.5 standard deviations above the mean. This approach helped to address a skewed distribution and outliers of very high counts.

Resource-based support was measured by six items that asked about the number of different people providing tangible resources (e.g., take care of respondent's children, provide transportation, help when respondent is sick in bed, and help with cooking and housework) and providing cognitive resources (e.g., talk with about money matters or provide useful advice about important things in life). Average counts of tangible support were categorized into three groups: (1) *Low* – Less than 1 persons on average, (2) *Moderate* – 1 to 3 persons on average, and (3) *High* – 4 or more persons on average. Social companionship was measured by one item that asked how many different people the respondent could count on to invite him or her to go out and do things. Social companionship counts were categorized into three groups: (a) *Low* – Less than 3 persons identified, (b) *Moderate* – 3 to 7 persons identified, and (c) *High* – 8 or more persons identified.

Service and Treatment History

Three variables were constructed using items from the *Household roster* and *Services received by caregivers* sections of the NSCAW I Caregiver Survey to capture prior service and treatment history that may act as potential confounding variables (Grella, Needell, Shi, & Hser, 2009). CPS Case at W1 was based upon NSCAW documentation of a CPS case being open at baseline W1 for the sampled child. Any Mental Health or Drug Treatment was based upon any lifetime or current history of (a) alcohol or drug treatment (i.e., inpatient rehabilitation, inpatient hospitalization, or clinic-based outpatient treatment) reported at W1, W3 or W4; (b) mental health treatment (i.e., inpatient hospitalization, clinic-based services, day treatment, partial hospitalization, or outpatient services) reported at W1, W3, or W4; or (c) any recent support group participation for alcohol or other drug, mental health, or parenting needs reported during W1, W3, or W4. Any Family/Parenting Services included any recent family counseling, parent skills training, and/or respite child care reported at W1, W3, or W4.

Parent Risk Factors

The study used two constructs for parent physical and emotional health from the Short-form Health Survey (SF-12; Ware, Kosinski, & Keller, 1996). This 12-item survey assessed physical and emotional functioning and associated role limitations that were due to identified problems. Standardized scores were constructed for physical health and mental health separately with higher scores indicating higher functioning. Internal consistency was $\alpha = 0.59$ for physical health and $\alpha = 0.79$ for mental health (Dowd et al., 2008). To capture parent history of criminal involvement, a binary variable was created from a question asking respondents if they had ever been arrested for any offense.

Demographic Control Variables

All demographic variables were obtained from Wave 4 data collection to correspond to the cross-sectional timeframe of the proposed study. Parent demographic characteristics included self-reported age, gender, race/ethnicity, and partnership status. Race/ethnicity was

derived from parent self-report of race and Hispanic origin to create four groups: Hispanic, non-Hispanic Black, non-Hispanic White, and non-Hispanic other. Non-Hispanic other was composed of Indian/Alaskan Native, Asian/Native Hawaiian/other Pacific Islander, and other race; the most rare race within the population was assigned when multiple races were reported (based on 1990 Census information; Dowd et al., 2008). Measures of socioeconomic status included parent education level, parent employment status, and household receipt of any government support by household member (i.e., TANF or other general assistance, WIC, food stamps, housing support, or disability SSI). Child demographic characteristics included gender and age.

Data Analysis Procedures

Survey Weights

NSCAW I weights were created by the original designers of the survey to account for variation in selection probabilities that arose from the multistage stratified sampling design and adjust for nonresponse and undercoverage (Biemer et al., 2008). The original designers of the survey highly recommend application of their weights to increase the likelihood that estimates are unbiased and reflect the U.S. child welfare population (excluding states that were not sampled due to their requiring agency-first contact) (Dowd et al., 2008). I applied the national sampling weight variable created by the original designers of the survey (and provided with the NSCAW I data) to account for variables used from W1, W3, and W4 interviews (Biemer et al., 2008). I used Stata 13 survey estimation and domain analysis procedures to apply the survey weights for a specific subpopulation (i.e., permanent caregivers). These procedures allowed this study to evaluate a subgroup of the full sample while also correctly estimating the variance (Biemer et al., 2008).

Attrition Analyses

A total of 1,934 (47.9%) of the 4,034 baseline respondents were excluded from the study because of different respondents reporting in prior waves (*n* = 424) or missing interviews in prior waves due to attrition (*n* = 922) or change in caregiver status (*n* = 451) in W3 or W4. For the final analytic sample, an additional 137 cases (3.3% of the entire CPS sample) were excluded because of one or more missing items. Given the large number of parents excluded from the final sample, attrition analysis was performed to identify any source of potential bias associated with item nonresponse.

The respondents included in the analytic sample were significantly more likely to be younger in age, female, or identify as the biological parent of the child compared with the attrition sample. They were significantly less likely to have any history of a child being removed from their care compared with the attrition sample; however, baseline investigation disposition, casework-perceived child welfare risks, or prior treatment history did not significantly differ between groups. The analytic sample was also more likely to include parent self-report of a higher frequency of maltreatment counts, specifically related to neglect. Based on these differences, the analytic sample was more likely to include families that came to the attention of CWS but remained intact with no observed differences in receipt of services, suggesting a more conservative child welfare sample that excluded families where removal was indicated for safety. Refer to Tables 6 and 7 for detailed results.

Table 6 Weighted Attrition Analyses of Demographic Characteristics (*N* = 4,034 Permanent Caregivers at Wave 1)

	Attrition Sample (*n* = 1934)		Analytic Sample (*n* = 2100)			
	n	*Weighted % or Mean(LSE)*	*n*	*Weighted % or Mean(LSE)*	Test Statistic χ2 or *t*	*p* value
Sampled child @ W1						
Child age (years)						
2–5	957	38.4	1084	40.0		
6–10	551	37.2	593	36.3		
11–16	426	24.4	423	23.7	1.49	0.829
Child gender						
Male	1,009	50.8	1022	49.9		
Female	925	49.2	1078	50.1	0.52	0.772
Permanent caregiver @ W1						
Age (years)						
< 35	1,232	60.7	1437	65.6		
35–44	481	28.3	535	28.0		
≥ 45–54	201	11.0	128	6.5	38.70	0.017
Gender						
Male	231	15.4	114	5.8		
Female	1,684	84.6	1986	94.2	137.40	< 0.001
Race/Ethnicity						
Non-Hispanic White	969	51.1	1093	51.2		
Non-Hispanic Black	502	24.2	550	25.0		
Hispanic	278	17.0	329	17.2		
Other	164	7.7	126	6.6	2.59	0.912
Partnership status						
Married / Co-Habit	908	46.0	991	46.0		
Other	1,005	54.0	1109	54.0	0.00	0.9972
Relationship to child						
Biological parent	1,687	89.8	2018	97.0		
Other	247	10.2	82	3.0	120.21	< 0.001
Education completed						
Less than high school	1,268	69.2	1423	70.5		
High school or more	635	30.8	673	29.5	1.05	0.685
Employment status						
Employed	974	57.3	1100	57.2		
Unemployed	262	13.1	293	10.2		
Other	677	29.6	706	32.6	14.32	0.287
Household @ W1						
Receipt of govt aid						
No	639	43.3	662	36.7		
Yes	1,272	56.7	1438	63.3	24.19	0.065
Number of children < 18 yrs						
1 child	607	29.1	558	25.5		
2 children	560	28.3	610	30.0		
3 children	421	23.2	489	21.9		
4 or more children	346	19.4	443	22.6	15.34	0.453

Table 7 Weighted Attrition Analyses of Key Variables (*N* = 4,034 Permanent Caregivers at Wave 1)

	Attrition Sample (*n* = 1934)		Analytic Sample (*n* = 2100)			
	n	*Weighted % or Mean(LSE)*	*n*	*Weighted % or Mean(LSE)*	Test Statistic χ2, *t,* or *F*	*p* value
Child welfare and tx history						
Any history of child removal						
No	874	74.0	1250	82.6		
Yes	434	25.0	396	17.4	47.46	0.006
Original investigation status						
Substantiated/High risk	705	26.7	718	20.9		
Indicated/Moderate risk	348	9.7	328	9.2		
Unfounded/Low risk	709	63.6	912	69.9	26.22	0.053
Casewrkr perceived CW risks						
None	300	33.5	382	33.2		
Mild	515	37.1	580	41.4		
Moderate	530	23.0	523	19.8		
Severe	241	6.4	230	5.5	13.11	0.446
Cgvr lifetime AOD treatment						
No	1,594	88.7	1843	91.9		
Yes	310	11.3	257	8.1	15.75	0.093
Cgvr lifetime MH treatment						
No	1,512	80.1	1723	83.9		
Yes	395	19.9	377	16.1	13.45	0.123
Permanent caregiver risk factor						
Physical health	1,892	49.1 (0.5)	2086	48.4 (0.5)	0.96	0.330
Mental health	1,892	48.0 (0.6)	2086	47.8 (0.5)	0.10	0.748
Any history of arrest						
No	1,254	68.7	1469	70.3		
Yes	612	31.3	631	29.7	1.48	0.630
Child maltreatment frequency						
Child maltreatment	1,849	6.2 (0.5)	2069	7.6 (0.5)	2.24	0.028
Physical abuse	1,864	0.6 (0.1)	2091	0.6 (0.1)	-0.01	0.993
Emotional abuse	1,861	3.2 (0.2)	2086	3.6 (0.3)	1.23	0.222
Neglect	1,860	2.4 (0.3)	2083	3.4 (0.4)	2.48	0.015
Substance use behavior						
No alcohol/illicit drug use	923	48.5	1045	49.6		
Light/mod drinking only	349	22.7	468	26.5		
Heavy drinking or illicit drug use	438	22.4	469	19.7		
Substance use disorder	141	6.4	116	4.2	25.27	0.314
Social support						
Resource-based support						
Low	631	32.5	668	29.7		
Moderate	752	41.7	904	44.1		
High	489	25.8	506	26.1	5.12	0.682
Social companionship						
Low	748	38.8	825	35.2		
Moderate	805	41.4	903	44.5		
High	347	19.8	367	20.3	7.85	0.580

Multivariate Analyses

The study used generalized linear regression models appropriate for count data. I selected negative binomial regression models (NBRM), given that traditional Poisson regression models would not appropriately address the over-dispersion observed for all dependent variables (Hilbe, 2011; Long, 1997). A negative binomial regression model adds a parameter (α) to the Poisson regression model that helps to account for the unobserved heterogeneity among observations and addresses potential inflation of the standard errors (Long & Freese, 2006). The most common variance function, NB2 (Cameron & Trivedi, 1986), was used when estimating models with Stata 13 for all analyses (Stata Corp, 2013). The chosen analytic approaches helped to address concerns Straus (2004) highlights about using the CTS-PC annual frequency data, such as over-dispersion leading to undue influence of outliers and inflated zero counts that were due to measuring rare events. The coefficients for these models are usually log-counts which are typically difficult to interpret; all model coefficients reported in this chapter were exponentiated to create incidence rate ratios (IRR) (Hilbe, 2011; Long, 1997). If a baseline rate for maltreatment behaviors is set at 1, then IRR values above 1 indicate a higher percentage of maltreatment behaviors compared with the base rate, whereas IRR values below 1 indicate a lower percentage of behaviors compared to the base rate.

All analysis procedures were conducted using Stata 13 (StataCorp, 2013). For the first three research questions, I first ran unadjusted NBRM to assess the bivariate relationship between the proposed independent (i.e., substance use pattern or social support type) and dependent variables (i.e., child maltreatment frequencies). I then stepped in well-established parent risk factors, such as arrest history, health, and mental health. I then added the block of variables measuring parent prior service history. The full and final models added demographic controls.

For the final research question, I used an NBRM to evaluate the moderating effect of social support type on the relationship between substance use pattern and child maltreatment

behaviors. I first ran cross-tabulations between the three main independent variables (i.e., substance use pattern, resource-based support, and social companionship) to assess cell sizes for the analyses. There were no cells with 0 counts; however, parents who were identified as being in recent recovery had very small cell sizes ($n < 10$). As a result, respondents from this group were reassigned (for these models only) to either the abstain/ex-use or non-problematic use category based on their W4 substance use status, creating a new substance use pattern variables with four categories: (a) abstain/ex-use, (b) non-problematic use, (c) problematic use, and (d) substance use disorder. Two blocks of interaction variables were then created: (1) substance use pattern X resource-based support, and (2) substance use pattern X social companionship.

For each type of maltreatment, interaction blocks were stepped in separately to determine if any categories were significantly related to the dependent variable. Specifically, the first model was composed of substance use pattern, social support type, and the interaction block for substance use pattern and resource-based support. I then ran a separate model assessing the interaction between substance use pattern and social companionship. Only interaction blocks with significant results at $p < 0.05$ were included in the full models, controlling for parent risk, service history, and demographic controls.

All models included model diagnostics and assessment of goodness of fit. Nested models were tested using adjusted Wald's test. In addition, Holm's sequential version of the Bonferroni correction was applied when conducting marginal comparisons across categorical groups to minimize likelihood of Type I errors (Holm, 1979; Abdi, 2010). Holm's sequential version orders the *p* values of all comparisons and orders them from smallest to largest. The comparison with the lowest probability is tested first with a Bonferroni correction, using *n* for all comparisons; the second comparisons with the second-lowest probability is then tested with a Bonferroni correction using ($n - 1$) for all comparisons; and so on. Finally, predictive margins associated with the independent variables of interest were calculated for all full models.

CHAPTER 5: RESULTS

Bivariate Analyses

Table 8 shows the unadjusted negative binomial regression model (NBRM) for each independent variable regressed on the four dependent variables used in this dissertation study. All independent variables are associated with at least one dependent variable at an alpha level of 0.05, statistically justifying further investigation of these hypothesized relationships. In addition, the relationships between substance use pattern and social support types with child maltreatment vary across types of maltreatment validating further investigation of these relationships by maltreatment type.

Table 8 Weighted Unadjusted Negative Binomial Regression Model (NBRM) for Main Independent Variables (*n* = 2,100)

	Child Maltreatment		Physical Abuse		Emotional Abuse		Neglect	
	IRR		IRR		IRR		IRR	
Substance Use Patterns (ref: Abstain/ex-use)								
Non-problematic	1.10		1.57		1.45	*	0.79	
Problematic	2.17	**	4.28	***	3.15	***	1.25	
Substance use disorder	3.48	***	5.67	***	4.41	***	2.58	**
In recent recovery	1.69		0.76		2.34		1.30	
Social Support								
Resource-based support (ref: Low)								
Moderate	0.82		1.04		0.67		0.99	
High	0.41	***	0.47	*	0.43	***	0.36	***
Social Companion (ref: Low)								
Moderate	0.85		1.15		0.77		0.90	
High	0.48	**	0.46		0.50	**	0.45	

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

Research Question 1: Parent Substance Use Patterns and General Maltreatment

Table 9 shows the results for a regression of general maltreatment on parent substance use patterns. Table 10 shows the pairwise comparisons for substance use patterns with corrected *p* values using Holm's sequential Bonferroni procedures (Abdi, 2010). Figure 3 displays the predictive margins for general maltreatment frequency by substance use pattern. Parents reporting substance use disorder (SUD) were expected to have 152% more instances of general maltreatment behaviors than did parents reporting being abstainers or ex-users. Using predictive margins, this would translate to an average annual general maltreatment frequency of 14.75 incidents (95% CI = [10.48, 19.01]) for parents reporting SUD compared with an average frequency of 5.86 incidents (95% CI = [4.33, 7.38]) for parents reporting being abstainers or ex-users (as shown in Figure 5.1). In addition, parents reporting SUD were expected to have 122% more instances of general maltreatment behaviors than did parents reporting being non-problematic users (i.e., current light or moderate drinkers with no past history of SUD; IRR = 2.22, 95% CI = [1.58, 3.12]). This comparison would translate to an average annual frequency of 14.75 incidents for parents reporting SUD compared with an average of 6.65 incidents (95% CI = [5.03, 8.27]) for parents reporting being non-problematic users. All other group differences for substance use patterns were not statistically significant.

For parent risks, parents reporting an arrest history increased expected incidences of general maltreatment by 43%, and expected annual frequency of general maltreatment decreased by 4% for every point increase in a parent's mental health score. Parent service history was also significantly related to general maltreatment behaviors, with a lifetime history of mental health or substance treatment increasing expected annual frequency by 45% and receipt of recent family services increasing expected annual frequency by 33%. Among demographic variables, only child age also was observed to be statistically significant, with higher expected annual frequencies observed for older child groups compared with children ages 2 to 5 years.

Table 9 Weighted Adjusted NBRM for General Child Maltreatment Regressed on Substance Use Patterns (n = 2,100)

	Model 1: Risks			Model 2: Services			Model 3: Full Model		
	IRR	95% CI		IRR	95% CI		IRR	95% CI	
Substance use patterns									
(ref: Abstain/ex-use)									
Non-problematic	1.17	[0.80, 1.70]		1.17	[0.81, 1.69]		1.14	[0.83, 1.54]	
Problematic	1.61	[1.09, 2.39]	*	1.69	[1.10, 2.61]	*	1.59	[1.13, 2.23]	**
Substance use disorder	2.63	[1.72, 4.02]	***	2.25	[1.56, 3.23]	***	2.52	[1.76, 3.61]	***
In recent recovery	0.77	[0.36, 1.69]		0.77	[0.34, 1.77]		0.81	[0.29, 2.22]	
Parent risks									
Arrest history	1.43	[1.07, 1.92]	*	1.40	[1.03, 1.90]	*	1.53	[1.12, 2.09]	**
Physical health	0.99	[0.97, 1.00]		0.99	[0.97, 1.00]		0.99	[0.97, 1.00]	
Mental health	0.96	[0.94, 0.97]	***	0.96	[0.95, 0.98]	***	0.96	[0.94, 0.97]	***
Parent service variables									
CPS services @ W1				1.13	[0.86, 1.49]		1.22	[0.96, 1.54]	
Lifetime MH or AOD tx				1.44	[1.06, 1.96]	*	1.45	[1.10, 1.91]	**
Recent family services				1.26	[0.96, 1.63]		1.33	[1.00, 1.76]	*
Focal child demographics									
Age (years) (ref: 2 to 5)									
6 to 10							1.79	[1.32, 2.43]	***
> 11							3.47	[2.40, 5.00]	***
Male							0.90	[0.66, 1.22]	
Parent demographics									
Age (years) (ref: < 35)									
35 to 44							0.95	[0.69, 1.31]	
≥ 45							0.95	[0.60, 1.51]	
Male							0.78	[0.49, 1.25]	
Race/ethnicity (ref: NH white)									
Non-Hispanic Black							1.00	[0.75, 1.34]	
Hispanic							1.23	[0.85, 1.78]	
Other							0.79	[0.46, 1.35]	
Married/co-habitating							1.06	[0.79, 1.43]	
Employment (ref: Employed)									
Unemployed							0.82	[0.58, 1.17]	
Other							0.81	[0.59, 1.12]	
Household Characteristics									
Receipt government aid							1.05	[0.80, 1.37]	
alpha	3.14	[2.67, 3.69]		3.07	[2.60, 3.63]		2.78	[2.33, 3.31]	
F	11.70	***		9.00	***		11.58	***	
Adjusted Wald Test *F*	24.01	***		3.23	*		4.04	***	

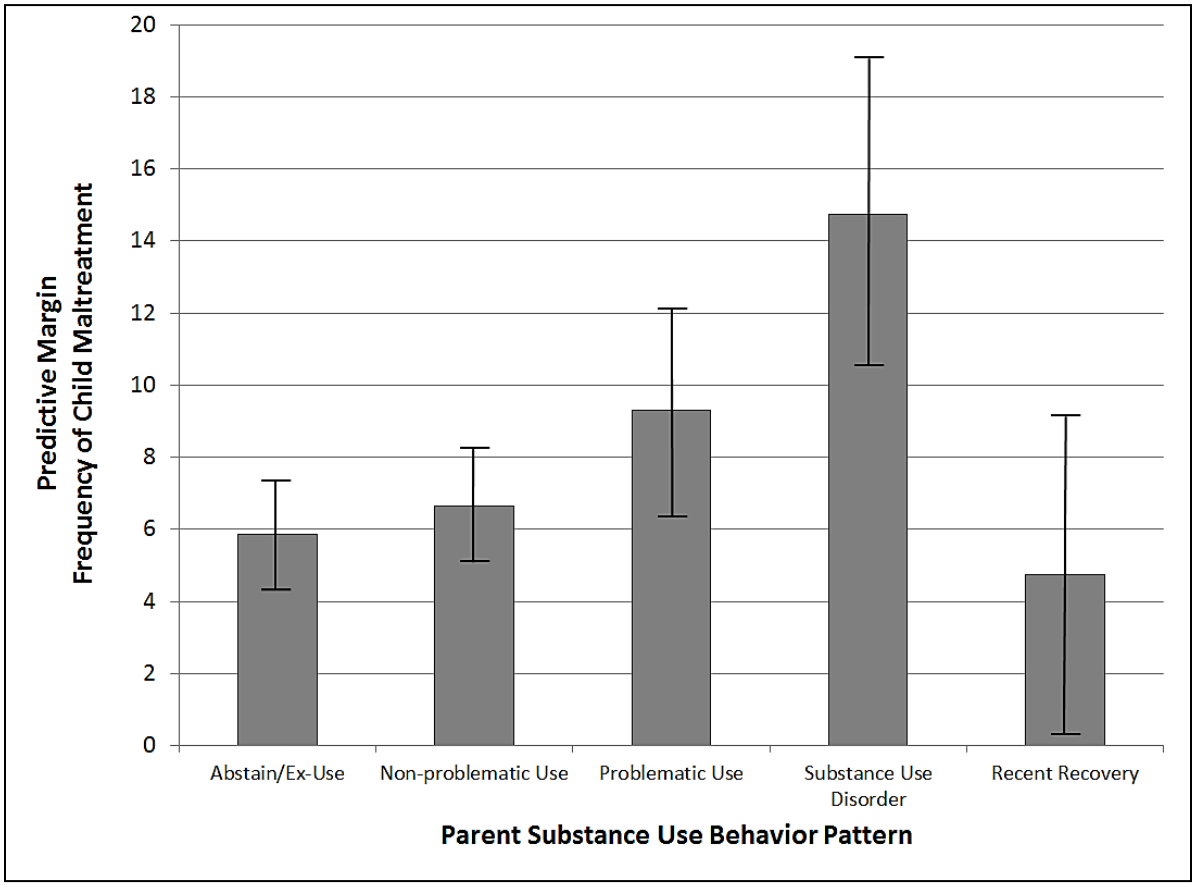
* $p < 0.05$, ** $p < 0.01$, ** $p < 0.001$

Table 10 Pairwise Comparisons of Substance Use Patterns for Child Maltreatment Frequency

Comparisons*	*t*	*p*	Holm's *p*
Non-problematic use vs.			
Abstain/ex-use	0.82	0.416	ns
Problematic use vs.			
Abstain/ex-use	2.70	0.008	ns
Non-problematic use	1.92	0.058	ns
SUD vs.			
Abstain/ex-use	5.11	< 0.001	< 0.001
Non-problematic use	4.65	< 0.001	< 0.001
Problematic use	2.15	0.016	ns
Recent recovery vs.			
Abstain/ex-use	-0.42	0.676	ns
Non-problematic use	-0.73	0.469	ns
Problematic use	-1.31	0.192	ns
SUD	-2.24	0.028	ns

***** Controlling for parent confounders, parent services, and demographics variables.

Figure 3 Predictive Margins for General Maltreatment Frequency



Note: All error bars represent 95% confidence intervals.

Research Question 2: Parent Substance Use Patterns and Child Maltreatment by Type

Table 11 shows the results for a regression of child maltreatment type on parent substance use patterns. Table 12 shows the pairwise comparisons for substance use patterns with corrected *p* values using Holm's sequential Bonferroni procedures (Abdi, 2010). Table 13 shows the predictive margins for physical abuse, emotional abuse, and neglect by substance use pattern.

Table 11 Weighted Adjusted NBRM for Child Maltreatment Frequency by Type Regressed on Substance Use Patterns (*n* = 2,100)

	Physical Abuse			Emotional Abuse			Neglect		
	IRR	95% CI		IRR	95% CI		IRR	95% CI	
Substance use patterns (ref: Abstain/ex-use)									
Non-problematic	2.46	[1.40, 4.34]	**	1.64	[1.21, 2.24]	**	0.77	[0.46, 1.31]	
Problematic	4.82	[2.70, 8.61]	***	2.68	[1.96, 3.67]	***	0.90	[0.53, 1.53]	
Substance use disorder	5.86	[3.15, 10.92]	***	3.81	[2.72, 5.34]	***	1.74	[0.90, 3.37]	
In recent recovery	0.92	[0.18, 4.61]		1.26	[0.47, 3.37]		0.37	[0.16, 0.88]	*
Parent Risks									
Arrest history	1.77	[1.05, 2.97]	*	1.52	[1.10, 2.09]	*	1.53	[0.95, 2.47]	
Physical health	0.99	[0.97, 1.02]		0.99	[0.98, 1.00]		0.99	[0.97, 1.01]	
Mental health	0.97	[0.95, 0.98]	**	0.96	[0.95, 0.98]	***	0.95	[0.92, 0.97]	
Parent service variables									
CPS services @ W1	1.12	[0.73, 1.70]		1.33	[1.04, 1.70]	*	1.34	[0.93, 1.92]	
Lifetime MH or AOD tx	1.24	[0.73, 2.10]		1.27	[0.96, 1.68]		1.83	[1.13, 2.97]	*
Recent family services	1.23	[0.76, 1.97]		1.38	[1.00, 1.89]	*	1.45	[0.96, 2.18]	
Focal child demographics									
Age (years) (ref: 2 to 5)									
6 to 10	1.12	[0.60, 2.11]		2.49	[1.74, 3.56]	***	1.72	[1.07, 2.75]	*
> 11	1.69	[0.92, 3.09]		3.48	[2.25, 5.38]	***	4.91	[2.77, 8.70]	***
Male	1.17	[0.73, 1.87]		0.88	[0.65, 1.19]		0.80	[0.51, 1.27]	
Parent demographics									
Age (years) (ref: < 35)									
35 to 44	1.52	[0.78, 2.96]		1.33	[0.94, 1.88]		0.66	[0.40, 1.10]	
≥ 45	1.49	[0.68, 3.27]		0.99	[0.61, 1.62]		0.81	[0.44, 1.49]	
Male	0.12	[0.04, 0.34]	***	0.75	[0.44, 1.28]		0.91	[0.44, 1.88]	
Race/Ethnicity (ref: NH white)									
Non-Hispanic black	1.60	[0.97, 2.64]		0.87	[0.61, 1.24]		1.26	[0.80, 1.99]	
Hispanic	1.66	[0.81, 3.43]		0.85	[0.51, 1.41]		1.56	[0.91, 2.68]	
Other	0.12	[0.05, 0.33]	***	0.57	[0.30, 1.08]		0.97	[0.53, 1.75]	
Married/co-habitating	0.85	[0.54, 1.33]		1.25	[0.93, 1.69]		1.00	[0.65, 1.52]	
Employment (ref: Emp)									
Unemployed	1.47	[0.77, 2.81]		1.11	[0.68, 1.80]		0.54	[0.29, 1.01]	
Other	2.30	[1.35, 3.90]	**	0.89	[0.63, 1.24]		0.76	[0.47, 1.24]	
Household characteristics									
Receipt government aid	0.79	[0.45, 1.38]		0.89	[0.63, 1.25]		1.24	[0.84, 1.83]	
alpha	8.16	[5.41, 12.30]		3.09	[2.57, 3.72]		6.58	[5.14, 8.43]	
F	7.66	***		10.05	***		5.81	***	
Wald Test *F* [Sub Use Pat]	14.58	***		21.00	***		2.68	*	

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

Table 12 Pairwise Comparisons of Substance Use Patterns by Child Maltreatment Type

	Physical Abuse			Emotional Abuse			Neglect		
Comparisons*	*t*	*p*	Holm's *p*	*t*	*p*	Holm's *p*	*t*	*p*	Holm's *p*
Non-problematic use vs.									
Abstain/ex-use	3.17	0.002	0.0168	3.21	0.002	0.013	-0.97	0.337	ns
Problematic use vs.									
Abstain/ex-use	5.39	< 0.001	< 0.001	6.26	< 0.001	< 0.001	-0.38	0.705	ns
Non-problematic use	1.73	0.088	ns	2.88	0.005	0.031	0.48	0.629	ns
SUD vs.									
Abstain/ex-use	5.65	< 0.001	< 0.001	7.90	< 0.001	< 0.001	1.68	0.097	ns
Non-problematic use	2.37	0.020	ns	4.25	< 0.001	< 0.001	2.57	0.012	ns
Problematic use	0.55	0.584	ns	1.69	0.095	ns	1.57	0.121	ns
Recent recovery									
Abstain/ex-use	-0.10	0.920	ns	0.47	0.641	ns	-2.29	0.024	ns
Non-problematic use	-1.34	0.183	ns	-0.57	0.569	ns	-1.70	0.093	ns
Problematic use	-2.16	0.034	ns	-1.48	0.142	ns	-1.94	0.060	ns
SUD	-2.25	0.027	ns	-2.24	0.028	ns	-3.06	0.003	0.030

***** Controlling for parent risks, parent prior services history, and demographics variables.

Table 13 Predictive Margins for Child Maltreatment Type by Substance Use Patterns

	Physical Abuse Freq Margin [95% CI]	Emotional Abuse Freq Margin [95% CI]	Neglect Freq Margin [95% CI]
Abstain/Ex-Use	0.23 [0.15, 0.32]	2.11 [1.67, 2.55]	3.87 [1.98, 5.75]
Non-Problematic	0.57 [0.30, 0.85]	3.47 [2.70, 4.24]	3.00 [1.50, 4.49]
Problematic	1.12 [0.47, 1.77]	5.65 [3.93, 7.38]	3.50 [1.70, 5.29]
Substance use disorder	1.36 [0.54, 2.19]	8.04 [5.28, 10.79]	6.75 [2.43, 11.06]
In Recovery	0.21 [-0.11, 0.54]	2.66 [0.19, 5.13]	1.44 [0.39, 2.51]

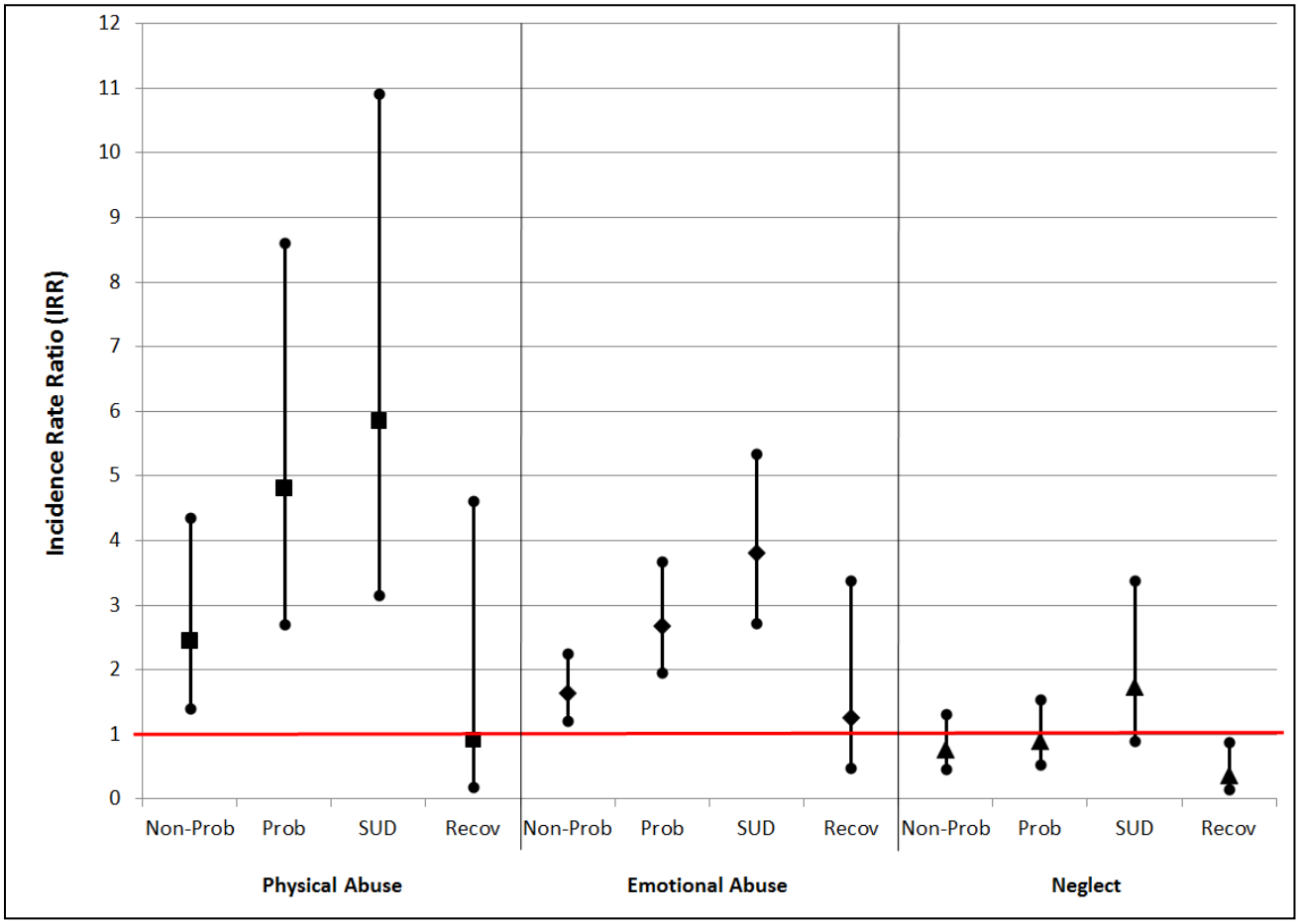
***** Controlling for parent risks, parent prior services history, and demographics variables.

Physical Abuse Frequency

Parents reporting SUD were expected to have 486% more instances of physically assaultive behaviors than did parents reporting being abstainers or ex-users. Using predictive margins, this would translate to an average annual physical abuse frequency of 1.36 incidents for parents reporting SUD (95% CI = [0.54, 2.19]) compared with an average frequency of 0.23 incidents for parents reporting being abstainers or ex-users (95% CI = [0.15, 0.32]). In addition, parents reporting problematic use were expected to have 382% more instances of physically assaultive behaviors than did parents reporting being abstainers or ex-users. This comparison would translate to an average annual frequency of 1.12 incidents for problematic users (95% CI = [0.47, 1.77]) compared with an average of 0.23 incidents for abstainers or ex-users. Finally, parents reporting non-problematic use were expected to have 146% more instances of

physically assaultive behaviors than did parents reporting being abstainers or ex-users. This comparison would translate to an average annual frequency of 0.57 incidents for problematic users (95% CI = [0.30, 0.85]) compared with an average of 0.23 incidents for abstainers or ex-users. All other group differences for substance use patterns were not statistically significant. As the high-low graph shown in Figure 4 illustrates, any current substance use was associated with a significantly higher expected frequency of physical abuse incidents for the past year compared with abstainers or ex-users; however, no statistically significant differences were observed between parents reporting any form of current use, likely because of large variance within each substance use pattern.

Figure 4 IRR High-Low Values for Substance Use Patterns by Child Maltreatment Type



Note: All error bars represent 95% confidence intervals.

Emotional Abuse Frequency

Parents reporting substance use disorder were expected to have 281% more instances of emotional abuse in the past year compared with parents reporting abstinence or ex-use. In comparison, parents reporting problematic use were expected to have 168% more instances of emotional abuse compared with those reporting abstinence or ex-use, and parents reporting non-problematic use were expected to have 64% more instances of emotional abuse compared with those reporting abstinence or ex-use. Results of multiple comparisons displayed in Table 12 demonstrate that compared with non-problematic use, both problematic use (IRR = 1.63, 95% CI = [1.16, 2.29]) and substance use disorder (IRR = 2.32, 95% CI = [1.57, 3.43]) were associated with a higher expected frequency of emotional abuse. As shown in Table 13, this would translate to an average annual emotional abuse frequency of 8.04 incidents for parents reporting SUD (95% CI = [5.28, 10.79]), 5.65 incidents for parents reporting problematic use (95% CI = [3.93, 7.38]), 3.47 incidents for parents reporting non-problematic use (95% CI = [2.70, 4.24]), and 2.11 parents reporting abstinence or ex-use (95% CI = [1.67, 2.55]). No statistically significant differences were observed between parents reporting problematic use or substance use disorder, probably because of large variance within these substance use patterns.

Neglect Frequency

Only parents reporting substance use disorder (SUD) were expected to have 421% more instances of neglectful behaviors than parents reporting being in recent recovery (IRR = 5.21, 95% CI = [2.15, 12.64]). As shown in Table 13, parent reporting substance use disorder would be expected to have an average of 6.75 neglect incidents per year compared with 1.44 neglect incidents per year for those in recovery. All other group differences for substance use patterns were not statistically significant after correcting for multiple comparisons. In fact, predictive margins for parents reporting abstinence or ex-use, non-problematic use, and problematic use were similar with average frequencies ranging from 3.00 to 3.87.

Comparison Across Maltreatment Types

Similar patterns were observed across substance use behavior patterns for both physical and emotional abuse (see Figure 4); however, the predictive margins shown in Table 13 indicate emotional abuse occurred at a higher frequency than physical abuse. Although any current use behaviors were associated with higher expected physical abuse frequencies compared with abstainers or ex-users, more of a gradient effect was observed for emotional abuse frequency with an additional significant difference between substance use patterns for non-problematic users and problematic users or those with SUD. Frequency of neglect behaviors differed from abuse frequency with only the difference between parents reporting substance use disorder and those in recovery being significantly different.

Research Question 3: Social Support Type and Child Maltreatment by Type

Prior to being corrected for multiple comparisons, resource-based supports were negatively related to general maltreatment frequency in the full model (IRR_{high} = 0.59, 95% CI = [0.38, 0.94]), holding all other variables constant. Parents with a high average number of perceived resource-based supports (i.e., > 0.5 standard deviations above the mean) were expected to have 41% fewer general maltreatment incidents than parents with low resource-based supports (i.e., < 0.5 standard deviations below the mean). After correcting for multiple comparisons, no significant relationships were observed between social support type and general maltreatment frequency when controlling for substance use pattern, parent risk, parent service history, and demographic controls.

Table 14 shows the full models for physical abuse, emotional abuse, and neglect. No significant relationships were observed between social support type and physical abuse or emotional abuse frequency. In the full model, resource-based supports were negatively associated with annual frequency of neglect. Table 15 shows the pairwise comparisons of the resource-based categories correcting for multiple comparisons. High levels of resource-based supports were significantly related to a lower expected annual frequency of neglect compared

with both low and moderate levels of resource-based supports. Figure 5 shows the predictive margins for neglect associated with different levels of resource-based social support, holding all other variables constant. Parents reporting a low or moderate number of resource-based supports had a predicted average of approximately 4 neglect incidents per year. In contrast, parents reporting a high number of resource-based supports had a predicted average of 1.62 neglect incidents per year (95% CI = [0.87, 2.37]).

Table 14 Weighted Adjusted NBRM for Child Maltreatment Frequency by Type Regressed on Social Support Type (n = 2, 100)

	Physical Abuse			Emotional Abuse			Neglect		
	IRR	*95% CI*		*IRR*	*95% CI*		*IRR*	*95% CI*	
Social support									
Resource-based (ref: Low)									
Moderate	0.77	[0.42, 1.41]		0.74	[0.51, 1.07]		0.87	[0.56, 1.37]	
High	0.48	[0.23, 1.00]		0.74	[0.41, 1.34]		0.34	[0.16, 0.69]	**
Social companion (ref: Low)									
Moderate	1.22	[0.65, 2.31]		0.95	[0.68, 1.35]		1.40	[0.90, 2.17]	
High	0.91	[0.38, 2.17]		0.92	[0.49, 1.74]		1.45	[0.65, 3.24]	
Substance use patterns (ref: Abstain/ex-use)									
Non-problematic	2.48	[1.37, 4.48]	**	1.76	[1.29, 2.40]	**	0.78	[0.50, 1.2]	
Problematic	5.00	[2.85, 8.76]	***	2.86	[2.12, 3.84]	***	0.92	[0.57, 1.51]	
Substance use disorder	5.24	[2.90, 9.48]	***	3.97	[2.76, 5.70]	***	1.61	[0.92, 2.83]	
In recent recovery	0.75	[0.18, 3.15]		1.12	[0.45, 2.83]		0.33	[0.15, 0.74]	**
Parent Risks									
Arrest history	1.77	[1.06, 2.94]	*	1.52	[1.10, 2.10]	*	1.62	[1.03, 2.57]	*
Physical health	1.00	[0.98, 1.02]		0.99	[0.98, 1.00]		0.99	[0.97, 1.01]	
Mental health	0.97	[0.95, 0.98]	**	0.97	[0.95, 0.98]	***	0.95	[0.93, 0.97]	***
Parent service variables									
CPS services @ W1	1..08	[0.72, 1.63]		1.32	[1.03, 1.70]	*	1.41	[1.01, 1.95]	*
Lifetime MH or AOD tx	1.19	[0.71, 2.00]		1.27	[0.96, 1.68]		1.65	[1.08, 2.51]	*
Recent family services	1.28	[0.81, 2.05]		1.32	[0.95, 1.82]		1.42	[0.94, 2.14]	
Focal child demographics									
Age (years) (ref: 2 to 5)									
6 to 10	1.00	[0.55, 1.82]		2.4	[1.67, 3.46]	***	1.65	[1.05, 2.59]	*
> 11	1.50	[0.82, 2.73]		3.43	[2.21, 5.32]	***	5.00	[2.89, 8.67]	***
Male	1.14	[0.71, 1.83]		0.86	[0.62, 1.19]		0.83	[0.54, 1.28]	
Parent demographics									
Age (years) (ref: < 35)									
35 to 44	1.58	[0.85, 2.92]		1.31	[0.93, 1.85]		0.75	[0.47, 1.20]	
≥ 45	1.49	[0.72, 3.10]		0.97	[0.61, 1.54]		0.87	[0.45, 1.69]	
Male	0.12	[0.05, 0.34]	***	0.78	[0.47, 1.30]		1.05	[0.51, 2.14]	
Race/Ethnicity (ref: NH white)									
Non-Hispanic black	1.72	[1.05, 2.81]	*	0.88	[0.61, 1.27]		1.34	[0.86, 2.10]	
Hispanic	1.51	[0.74, 3.11]		0.81	[0.51, 1.29]		1.61	[0.98, 2.65]	
Other	0.12	[0.05, 0.32]	***	0.55	[0.30, 1.01]		1.16	[0.60, 2.23]	
Married/co-habitating	0.88	[0.56, 1.40]		1.27			0.88	[0.59, 1.33]	
Employment (ref: Emp)									
Unemployed	1.53	[0.83, 2.85]		1.12	[0.95, 1.71]		0.54	[0.31, 0.94]	*
Other	2.14	[1.24, 3.70]	**	0.87	[0.72, 1.72]		0.83	[0.50, 1.36]	
Household characteristics									
Receipt government aid	0.72	[0.40, 1.28]		0.91	[0.65, 1.26]		1.15	[0.80, 1.66]	
alpha	2.07	[1.65, 2.48]		3.05	[2.55, 3.66]		6.37	[5.01, 8.10]	
F (4, 80)	8.67	***		9.25	***		6.97	***	
Wald Test F [Social Support]	2.02			1.10			3.43	*	

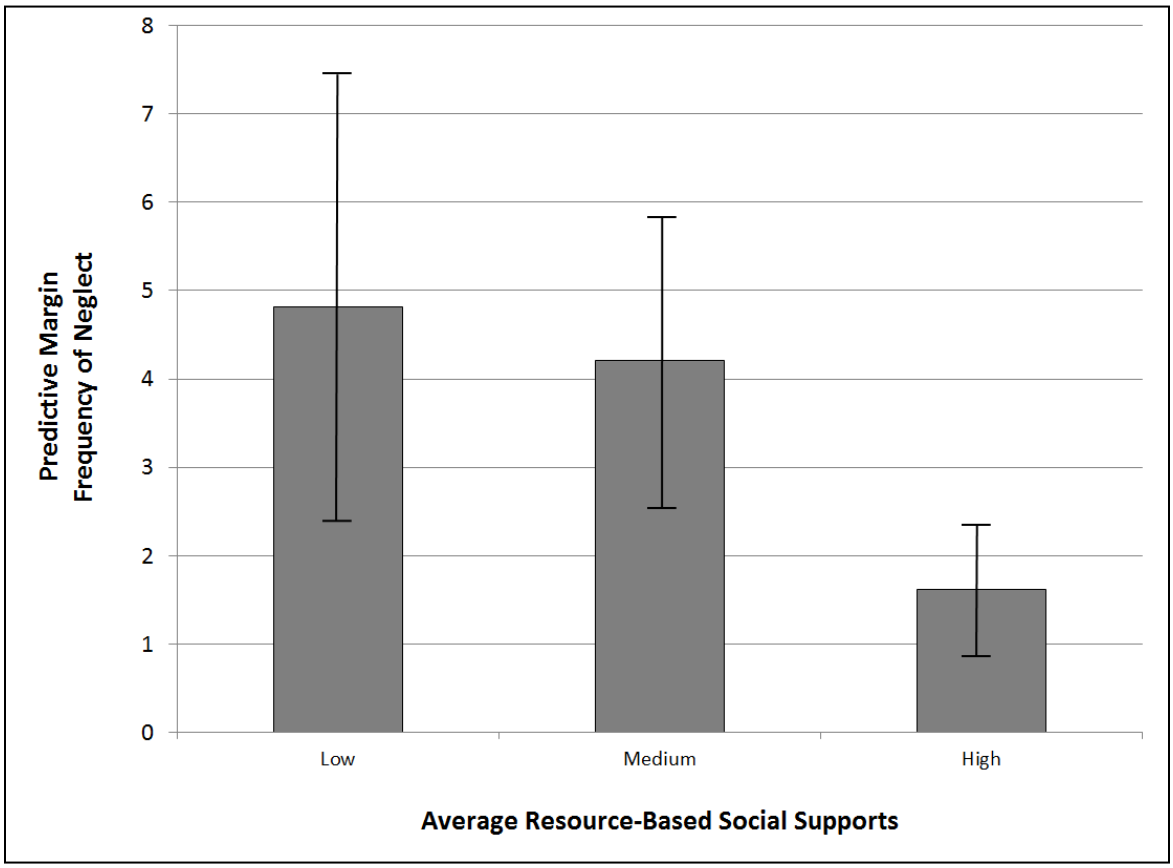
* $p < 0.05$, ** $p < 0.01$, ** $p < 0.001$

Table 15 Pairwise Comparisons of Social Support Type Levels for Child Maltreatment Frequency by Type

	Physical Abuse			Emotional Abuse			Neglect		
Comparisons*	*t*	*p*	Holm's *p*	*t*	*p*	Holm's *p*	*t*	*p*	Holm's *p*
Resource-based									
Low vs.									
Moderate	-0.86	0.393	ns	-1.63	0.108	ns	-0.59	0.554	ns
High	-1.98	0.051	ns	-1.00	0.322	ns	-2.99	0.004	0.007
Moderate vs.									
High	-1.29	0.202	ns	-0.03	0.977	ns	-3.40	0.001	0.003
Social companionship									
Low vs.									
Moderate	0.63	0.533	ns	-0.27	0.784	ns	1.51	0.134	ns
High	-0.22	0.823	ns	-0.25	0.806	ns	0.91	0.365	ns
Moderate vs.									
High	-0.74	0.460	ns	-0.11	0.910	ns	0.10	0.921	ns

***** Controlling for substance use pattern, parent risks, parent prior services history, and demographics variables.

Figure 5 Predictive Margins for Neglect Frequency by Resource-based Support



Note: All error bars represent 95% confidence intervals.

Research Question 4: Parent Substance Use Patterns, Social Support Type, and Child Maltreatment

No significant relationship was observed for general maltreatment or emotional abuse regressed on either block of interactions between social support type and substance use pattern. Two major significant findings were observed: (a) parents with moderate levels of resource-based support who reported non-problematic use, problematic use, or substance use disorder had a higher frequency of physical abuse compared with abstainers/ex-users with moderate levels of resource-based support; and (b) neglect frequency regressed on substance use patterns interacted with social. Only hypothesized multiple comparisons were conducted to assess differences between substance use patterns at each level of social support for both *physical abuse x resource-based supports* and *neglect x social companionship.*

Physical Abuse x Resource-Based Supports

Table 16 displays the stepped-in and full models for physical abuse frequency regressed on the interaction between substance use patterns and resource-based supports. Table 17 shows the corresponding results of multiple comparisons between substance use groups at each level of social support with corrected *p* values. The main effects of substance use patterns and social support types were not significant when the interaction and all control variables were added to the full model. Regarding the interaction, several between-group differences remained statistically significant even after correcting for 18 multiple comparisons. Parents with moderate levels of resource-based support who reported non-problematic use, problematic use, or substance use disorder had a higher frequency of physical abuse compared with abstainers/ex-users with moderate levels of resource-based support.

Table 16 Physical Abuse Frequency Regressed on the Interaction between Substance Use Patterns and Social Support Type (*n* = 2,100)

	Model 1: Interaction Block			Model 2: Full Model		
	IRR	95% CI		IRR	95% CI	
Substance use patterns						
(ref: Abstain/ex-use)						
Non-problematic	1.32	[0.45, 3.91]		2.79	[0.85, 9.17]	
Problematic	2.23	[0.91, 5.49]		1.75	[0.81, 3.74]	
Substance use disorder	2.73	[0.95, 7.87]		1.69	[0.75, 3.84]	
Social support						
Resource-based (ref: Low)						
Moderate	0.32	[0.12, 0.88]	*	0.50	[0.22, 1.13]	
High	0.46	[0.12, 1.75]		0.65	[0.25, 1.68]	
Social companion (ref: Low)						
Moderate	1.09	[0.52, 2.29]		0.97	[0.51, 1.83]	
High	0.58	[0.18, 1.86]		0.66	[0.27, 1.63]	
SU pattern x resource-based						
Non-probl x mod resource	2.26	[0.58, 8.76]		1.33	[0.33, 5.40]	
Probl x mod resource	4.48	[1.06, 18.96]	*	5.74	[1.64, 20.12]	**
SUD x mod resource	5.05	[1.21, 21.01]	*	7.09	[1.90, 26.39]	**
Non-probl x high resource	1.24	[0.20, 7.78]		0.45	[0.09, 2.22]	
Probl x high resource	2.10	[0.47, 9.37]		2.57	[0.56, 11.75]	
SUD x high resource	1.18	[0.24, 5.91]		1.29	[0.32, 5.16]	
Parent risks						
Arrest history				1.77	[1.06, 2.94]	*
Physical health				0.99	[0.98, 1.02]	
Mental health				0.96	[0.94, 0.98]	***
Parent service variables						
CPS services @ W1				1.12	[0.73, 1.71]	
Lifetime MH or AOD tx				1.16	[0.70, 1.91]	
Recent family services				1.27	[0.80, 2.00]	
Focal child demographics						
Age (years) (ref: 2 to 5)						
6 to 10				0.89	[0.50, 1.58]	
> 11				1.44	[0.79, 2.63]	
Male				1.19	[0.74, 1.92]	
Parent demographics						
Age (years) (ref: < 35)						
35 to 44				1.42	[0.75, 2.69]	
≥ 45				1.54	[0.73, 3.29]	
Male				0.11	[0.04, 0.32]	***
Race/ethnicity (ref: NH White)						
Non-Hispanic Black				1.76	[1.06, 2.92]	*
Hispanic				1.42	[0.74, 2.74]	
Other				0.14	[0.06, 0.33]	***
Married/co-habitating				0.86	[0.55, 1.35]	
Employment (ref: Employed)						
Unemployed				1.41	[0.79, 2.54]	
Other				2.05	[1.23, 3.42]	**
Household characteristics						
Receipt government aid				1.15	[0.34, 1.09]	
alpha	10.49	[7.22,15.25]		7.58	[5.01, 11.48]	
F	3.66	***		7.23	***	
Wald Test *F* [Interaction]	1.24			2.61	*	

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

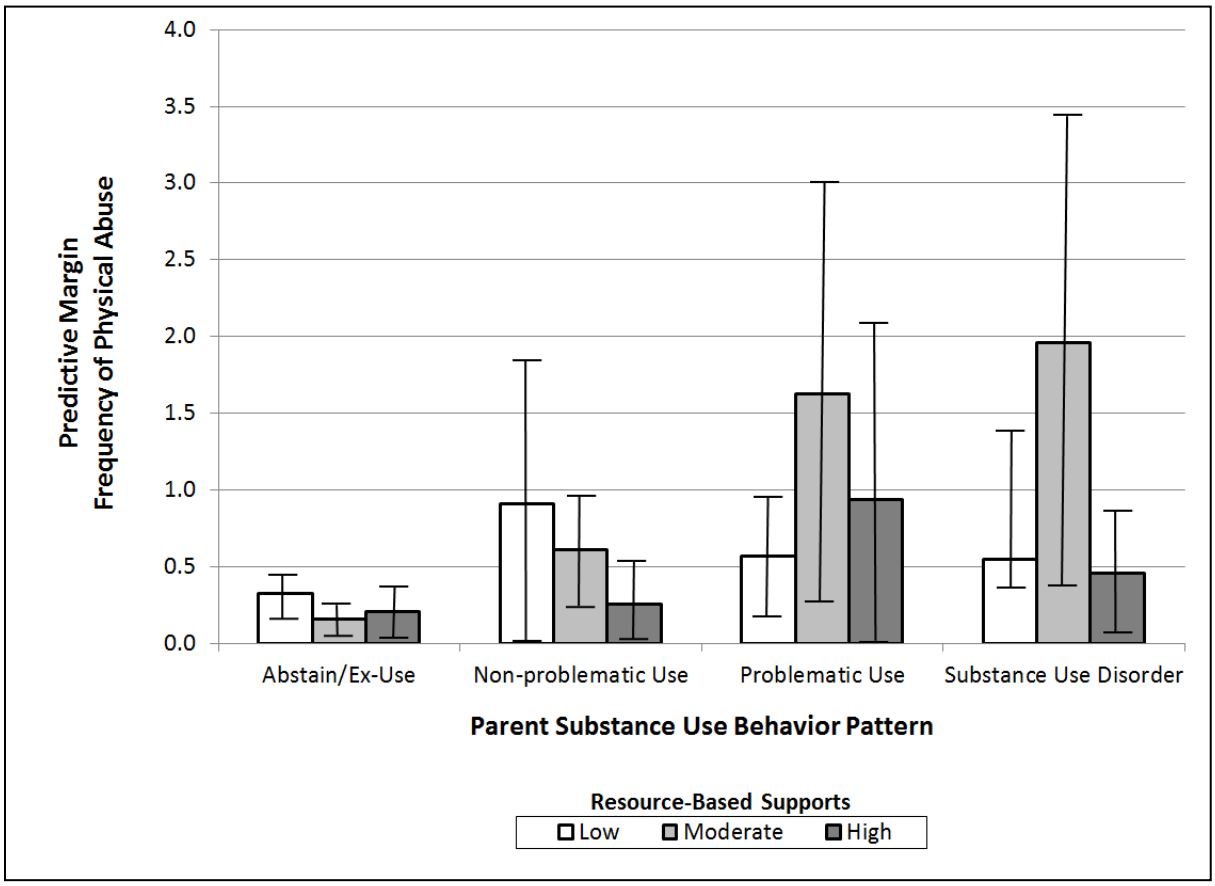
Table 17 Pairwise Comparisons of Between Group Differences (Substance Use) for Physical Abuse Frequency

	t	*p*	Holm's *p*
Non-problematic use x low resource vs.			
Abstain/ex-use x low resource	1.72	0.089	ns
Non-problematic use x mod resource vs.			
Abstain/ex-use x mod resource	3.24	0.002	0.028
Non-problematic use x high resource vs.			
Abstain/ex-use x high resource	0.40	0.693	ns
Problematic use x low resource vs.			
Abstain/ex-use x low resource	1.45	0.151	ns
Non-problematic use x low resource	-0.79	0.435	ns
Problematic use x mod resource vs.			
Abstain/ex-use x mod resource	4.62	< 0.001	< 0.001
Non-problematic use x mod resource	1.90	0.061	ns
Problematic use x high resource vs.			
Abstain/ex-use x high resource	2.34	0.022	ns
Non-problematic use x high resource	1.89	0.063	ns
SUD x low resource vs.			
Abstain/ex-use x low resource	1.28	0.204	ns
Non-problematic use x low resource	-0.79	0.430	ns
Problematic use x low resource	-0.07	0.947	ns
SUD x mod resource vs.			
Abstain/ex-use x mod resource	5.38	< 0.001	< 0.001
Non-problematic use x mod resource	2.63	0.010	ns
Problematic use x mod resource	0.34	0.736	ns
SUD x high resource vs.			
Abstain/ex-use x high resource	1.38	0.173	ns
Non-problematic use x high resource	0.79	0.429	ns
Problematic use x high resource	-1.01	0.316	ns

***** Controlling for parent risks, parent prior services history, and demographics variables.

Figure 6 presents the predictive margins for average physical abuse frequencies in bar graph format to display visually the interaction between substance use patterns and resource-based supports. At moderate levels of social support, abstainers/ex-users have a predicted average of 0.16 physical abuse incidents per year (95% CI = [0.05, 0.28]). This predictive margin is significantly less than the 0.61 incidents predicted for non-problematic users (95% CI = [0.23, 0.98]), 1.63 incidents predicted for problematic users (95% CI = [0.27, 3.00]), and 1.96 predicted for those with substance use disorder (95% CI = [0.36, 3.56]).

Figure 6 Predictive Margins by Interaction between Substance Use Patterns x Resource-based Supports for Physical Abuse



Note: All error bars represent 95% confidence intervals.

Neglect x Social Companionship

For neglect, the only significant interactions were observed with social companionship. While there were no significant interactions between neglect and resource-based supports, high levels of resource-based supports continued to be associated with lower frequencies of neglect on average compared with low levels of resource-based supports, regardless of a parent's substance use pattern. Table 18 displays the stepped-in and full models for neglect frequency regressed on the interaction between substance use patterns and social companionship. The main effect of substance use patterns remains significant after adding the interaction and control variables: Parents reporting problematic use or substance use disorder were associated with higher frequencies of neglect on average compared with abstainers/ex-users. The main effect for social companionship was also significant when the interaction and all control variables were added to the full model. Specifically, moderate levels of social companionship were associated with higher frequencies of neglect on average compared with low levels of social companionship.

Table 19 shows the corresponding results of multiple comparisons between substance use groups at each level of social support with corrected *p* values. Several between-group differences remained statistically significant even after correcting for 18 multiple comparisons. Parents with moderate levels of social companionship who reported substance use disorder had a higher frequency of neglect on average compared with non-problematic users and problematic users with moderate levels of social companionship. Parents reporting problematic use were associated with higher frequencies of neglect than those reporting abstinence/ex-use for low levels of social companionship. However, problematic use was associated with lower frequencies of neglect on average than abstinence/ex-use at moderate levels of social companionship,

Table 18 Neglect Frequency Regressed on the Interaction Between Substance Use Patterns and Social Support Type (*n* = 2,100)

	Model 1: Interaction Block			Model 2: Full Model		
	IRR	95% CI		IRR	95% CI	
Substance use patterns						
(ref: Abstain/ex-use)						
Non-problematic	1.36	[0.78, 2.38]		1.09	[0.64, 1.86]	
Problematic	3.15	[1.61, 6.17]	**	2.80	[1.45, 5.43]	**
Substance use disorder	2.77	[1.57, 4.88]	**	1.95	[1.04, 3.68]	*
Social support						
Resource-based (ref: Low)						
Moderate	1.12	[0.79, 1.57]		1.02	[0.70, 1.48]	
High	0.47	[0.26, 0.85]	*	0.41	[0.22, 0.78]	**
Social companion (ref: Low)						
Moderate	2.07	[1.13, 3.81]	*	2.64	[1.43, 4.86]	**
High	0.66	[0.24, 1.87]		1.04	[0.39, 2.75]	
SU pattern x social companion						
Non-probl x mod soc comp	0.22	[0.09, 0.52]	**	0.33	[0.13, 0.80]	*
Probl x mod soc comp	0.09	[0.03, 0.23]	***	0.09	[0.04, 0.24]	***
SUD x mod soc comp	0.66	[0.23, 1.91]		0.74	[0.25, 2.20]	
Non-probl x high soc comp	1.83	[0.42, 8.03]		2.23	[0.53, 9.31]	
Probl x high soc comp	0.25	[0.08, 0.77]	*	0.32	[0.32, 0.23]	
SUD x high soc comp	1.62	[0.34, 7.69]		1.98	[0.40, 9.74]	
Parent risks						
Arrest history				1.30	[0.85, 2.00]	
Physical health				0.99	[0.98, 1.01]	
Mental health				0.96	[0.94, 0.98]	***
Parent service variables						
CPS services @ W1				1.49	[1.08, 2.07]	*
Lifetime MH or AOD tx				1.58	[1.08, 2.30]	*
Recent family services				1.39	[0.94, 2.06]	
Focal child demographics						
Age (years) (ref: 2 to 5)						
6 to 10				1.75	[1.13, 2.70]	*
> 11				4.55	[2.65, 7.84]	***
Male				0.85	[0.56, 1.31]	
Parent demographics						
Age (years) (ref: < 35)						
35 to 44				0.73	[0.46, 1.16]	
≥ 45				1.19	[0.61, 2.33]	
Male				1.30	[0.64, 2.67]	
Race/ethnicity (ref: NH white)						
Non-Hispanic Black				1.29	[0.84, 1.97]	
Hispanic				1.41	[0.87, 2.29]	
Other				1.29	[0.65, 2.56]	
Married/co-habitating				0.97	[0.66, 1.43]	
Employment (ref: Employed)						
Unemployed				0.56	[0.35, 0.91]	*
Other				0.91	[0.58, 1.42]	
Household characteristics						
Receipt government aid				1.32	[0.91, 1.92]	
alpha	7.24	[5.84, 8.98]		5.99	[4.67, 7.69]	
F	7.39	***		14.28	***	
Wald Test *F* [Interaction]	5.82	***		4.85	***	

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

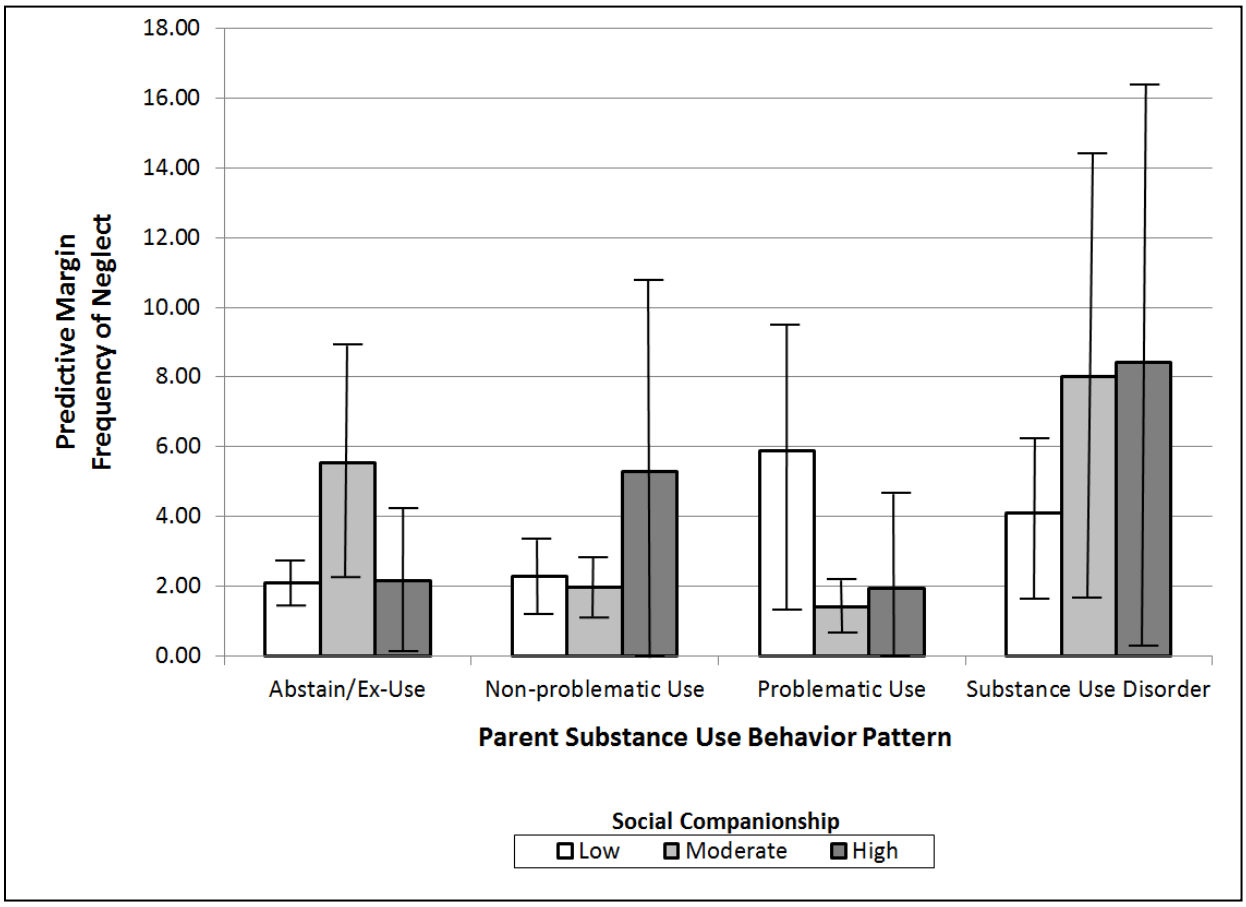
Table 19 Pairwise Comparisons of Between Group (Substance Use) Differences for Neglect Frequency

	t	*p*	Holm's *p*
Problematic use x low soc comp vs.			
Abstain/ex-use x low soc comp	3.09	0.003	0.032
Non-problematic use x low soc comp	2.39	0.019	ns
Problematic use x mod soc comp vs.			
Abstain/ex-use x mod soc comp	-3.75	< 0.001	0.005
Non-problematic use x mod soc comp	-1.02	0.312	ns
Problematic use x high soc comp vs.			
Abstain/ex-use x high soc comp	-0.21	0.832	ns
Non-problematic use x high soc comp	-1.25	0.216	ns
SUD x low soc comp vs.			
Abstain/ex-use x low soc comp	2.10	0.038	ns
Non-problematic use x low soc comp	1.62	0.110	ns
Problematic use x low soc comp	-0.85	0.398	ns
SUD x mod soc comp vs.			
Abstain/ex-use x mod soc comp	0.78	0.435	ns
Non-problematic use x mod soc comp	3.49	0.001	0.009
Problematic use x mod soc comp	3.55	0.001	0.010
SUD x high soc comp vs.			
Abstain/ex-use x high soc somp	2.11	0.037	ns
Non-problematic use x high soc comp	0.72	0.474	ns
Problematic use x high soc comp	1.62	0.110	ns

***** Controlling for parent risks, parent prior services history, and demographics variables

Figure 7 presents the predictive margins for average neglect frequencies in bar graph format to display visually the interaction between substance use patterns and social companionship. At low levels of social companionship, problematic users had a significantly higher predicted average of neglect per year at 5.90 (95% CI = [2.31, 9.49]) than abstainers/ex-users at 2.11 (95% CI = [1.49, 2.72]). At moderate levels of social support, abstainers/ex-users have a predicted average of 5.55 neglect incidents per year (95% CI = [2.11, 9.00]). This predictive margin was more than the 1.98 incidents predicted for non-problematic users (95% CI = [1.05, 2.91]) and significantly more than the 1.42 incidents predicted for problematic users (95% CI = [0.66, 2.17]). In contrast, predictive margins for these groups were less than the 8.00 neglect incidents per year predicted for parents reporting substance use disorder (95% CI = [(1.60, 14.41)]. At high levels of social companionship, difference in average neglect incidents are apparent across groups; however, I did not observe statistically significant difference in predictive margins between substance use patterns that were due to a high amount of variance.

Figure 7 Predictive Margins by Interaction between Substance Use Patterns x Social Companionship for Neglect



Note: All error bars represent 95% confidence intervals.

Secondary Analyses: Within Substance Use Pattern Comparisons

Table 20 shows the results of multiple comparisons within substance use patterns at each level of social support with corrected *p* values for *physical abuse x resource-based supports* and *neglect x social companionship*. For physical abuse, there were no statistically significant within-group differences observed across any two levels of resource-based support. For neglect, moderate levels of social companionship were associated with decrease expected neglect frequency for problematic drinkers when compared with problematic drinkers with low levels of social companionship. In addition, abstainers/ex-users with moderate levels of social companionship were associated with increased expected neglect frequency when compared with abstainers/ex-users with low levels of social companionship.

Table 20 Secondary Analyses of Pairwise Comparisons for Within Group (Substance Use) Differences

	Physical Abuse			Neglect		
	t	*p*	Holm's *p*	*t*	*p*	Holm's *p*
Abstain ex-use x low support type vs.						
Abstain/ex-use x moderate	-1.70	0.093	ns	3.16	0.002	0.015
Abstain/ex-use x high	-0.90	0.368	ns	0.07	0.942	ns
Non-problematic x low support type vs.						
Non-problematic x moderate	-0.66	0.511	ns	-0.48	0.636	ns
Non-problematic x high	-1.83	0.071	ns	1.43	0.155	ns
Problematic x low support type vs.						
Problematic x moderate	2.07	0.042	ns	-3.90	< 0.001	0.002
Problematic x high	0.67	0.505	ns	-1.37	0.173	ns
SUD x low support type vs.						
SUD x moderate	2.10	0.039	ns	1.42	0.159	ns
SUD x high	-0.30	0.766	ns	1.15	0.255	ns

***** Controlling for parent risks, parent prior services history, and demographics variables.

CHAPTER 6: DISCUSSION AND CONCLUSIONS

This study examined the relationship between substance use, social support, and child maltreatment in ways that built upon prior studies, critiquing binary approaches to operationalizing these concepts. Guided by the rationale that substance use behaviors occur on a continuum and are associated with varying levels of neuropsychological impairments (Fernandez-Serrano et al., 2011; SAMHSA, 2012), this study first explored if variations in parent substance use behavior patterns (i.e., abstainer/ex-user, non-problematic use, problematic use, SUD, & in recovery) were associated with a higher frequency of general maltreatment behaviors. The study further examined these relationships by frequency of maltreatment type (i.e., physical abuse, emotional abuse, and neglect). Guided by prior work highlighting differences between resource-based supports and social companionship (Cohen & Wills, 1985; Freisthler, Holmes, & Price Wolf, 2014), the study also examined the relationship between these two types of social support and frequencies of general maltreatment, physical abuse, emotional abuse, and neglect. Finally, the interactions between substance use patterns and social support types were assessed to understand if types of support were differently associated with child maltreatment frequencies depending on parents' substance use behaviors.

Major Findings

1. Substance use disorder was associated with a higher expected frequency of general maltreatment compared to non-problematic use and to abstinence or former use.
2. The nature of the relationships between substance use patterns and child maltreatment frequencies varied by maltreatment type: (a) parents reporting any current substance use were associated with a higher frequency of physical abuse on average compared with those reporting lifetime abstinence or former use; (b) higher intensity of substance use behaviors were associated with higher frequency of emotional abuse; and (c) higher frequency of

neglect was only observed between parents reporting substance use disorder (compared to those in recent recovery).

3. High levels of resource-based supports were associated with lower neglect frequency compared to low or moderate levels of resource-based supports.
4. For physical abuse, non-problematic users, problematic users, and those with substance use disorders had a higher frequency of physical abuse on average compared with abstainers/ex-users, at moderate levels of resource-based support.
5. For neglect, problematic users reported higher frequencies of neglect on at low levels of social companionship than at moderate levels of social companionship. At moderate levels of social companionship, parents reporting SUD were associated with higher frequency of neglect compared to non-problematic users and problematic users.

Research Question 1: Are parent substance use patterns associated with frequency of general maltreatment?

The results from the first research question do not support the hypothesis that problematic use was associated with a higher expected frequency of general maltreatment compared with abstainers/ex-users or non-problematic users. The hypothesis associated with parents reporting SUD was partially supported given that this group was associated with a higher expected frequency of general maltreatment compared with abstainers/ex-users and non-problematic users but not compared with problematic users or those in recent recovery.

These results support the concern that dichotomous approaches may be conflating importance distinctions in risk across substance use behavior groups. These results also provide the strongest rationale that parents reporting SUD, who are also at the highest risk for pervasive substance-related impairments in social information processing, were more likely to engage in chronic general maltreatment behaviors on average compared with substance use behaviors associated with low to minimal risk for neuropsychological impairments (Fillmore,

2012; Herrenkohl, 2005).Thus lifetime measures of any form of alcohol/drug use as a measure of risk may be inappropriate and may explain inconsistent findings for studies using this approach (e.g., Dubowitz et al., 2011).

In light of social information processing models of abuse and neglect, the lack of difference observed between parents reporting SUD and problematic use may be due to the associated effects of acute intoxication and withdrawal being more influential in frequency of general maltreatment behaviors than pervasive impairments from prolonged, chronic use (Fernandez-Serrano et al., 2011). Neuropsychological functioning across individuals within these two groups may not be significantly different either because of prior tendencies (e.g., disinhibition) that promote early onset of heavy drinking and/or substance use (Tarter et al., 2003). Alternatively, parents reporting SUD may include a range of neuropsychological impairments with pervasive impairments only present in the most extreme cases involving polysubstance use and long durations of high consumption (Vik et al., 2004). The study's operationalization of SUD does not allow for these distinctions to be made. These results may also be due to general maltreatment combination of three types of maltreatment behaviors. The higher frequency of neglect behaviors compared to other types of maltreatment likely weight findings towards these behaviors.

Research Question 2: Are parent substance use patterns associated with the frequency of child maltreatment type?

Physical Abuse

Findings support the hypotheses that parents reporting non-problematic use, problematic use, and substance use disorder will have a higher expected frequency of physical abuse than those reporting lifetime abstinence or former use without a recent history of SUD. This is consistent with a prior study that observed that light, moderate, and some heavy drinking behaviors were associated with physical abuse frequencies compared with lifetime abstinence (Freisthler, Holmes, & Price Wolf, 2014). As a result, comparison of parents with substance use

problems with all other parents (e.g., Brown et al., 1998; Chaffin et al., 1996; Dube et al., 2001; Kelleher et al., 1994; Sedlak et al., 2010; Stith et al., 2009; Walsh et al., 2003) may conflate important factors associated with physical abuse behaviors, such as the importance of distinguishing parents with less problematic use behaviors from those not currently using substances.

Contrary to my hypotheses, parents reporting being in recent recovery did not significantly differ from any group, including those reporting abstinence or former use. The large variance for this group and the small sample size likely contributed to a lack of findings. The variance may be due to a wide variation in functioning within this group based upon time since recovery (which was not specifically measured in this cross-sectional study) or combining current non-users with current light/moderate drinkers. In addition, differences between currently using groups did not significantly differ from each other. The low overall incidence of these behaviors translates into small differences in average frequency (0 versus 1 incident, on average), which may have contributed to why I did not observe significant differences for other hypothesized comparisons, such as between problematic use and non-problematic use or problematic use and SUD.

Social information processing models align with the findings that even low levels of disinhibition arising from any alcohol or drug use may be sufficient to increase physical abuse frequency (Milner, 1993, 2000). Alternatively, other factors distinguishing current users from current non-users may better explain the observed relationship. For example, parents may be using alcohol or drugs to alleviate psychological distress. These experiences of distress can also interfere with essential neuropsychological functions, contributing to physically aggressive behavior, such as interpretation of benign behavior as threatening or emotion dysregulation (Goodman et al., 2013; Hostinar, Sullivan, & Gunnar, 2014; Raio et al., 2013; Taylor, 2011).

Emotional Abuse

Consistent with prior work, a higher frequency of emotionally abusive behavior was observed compared with other forms of maltreatment (Straus & Field, 2003). The results for emotional abuse support my hypotheses that parents reporting non-problematic use, problematic use, and substance use disorder will be associated with a higher frequency of emotional abuse compared to those reporting lifetime abstinence or former use without a recent history of SUD. However, additional differences between categories were observed: Any current heavy drinking and/or illicit drug use behaviors (i.e., problematic use or SUD) were associated with a higher expected frequency of emotional abuse than light or moderate drinking (i.e., non-problematic users). These results build upon the few studies observing a positive association between emotional abuse and alcohol use disorder (Dube et al., 2001; Palusci & Ondersma, 2012; Sedlak et al., 2010) and emphasize the importance of understanding substance use behaviors along a continuum given the observed variation in chronicity of behaviors by group.

No statistically significant differences were observed between SUD and problematic use categories. In addition, no statistically significant differences were observed for all hypothesized comparisons related to parents in recent recovery. The limitations discussed in the prior physical abuse section for parents in recent recovery apply equally to these results.

Within the framework of social information processing models, low levels of disinhibition associated with non-problematic use may increase the likelihood of parents making verbally aggressive statements towards children. As disinhibition and regulation become more compromised from acute intoxication and/or withdrawal, parents may be even more apt to respond to children with verbal aggression. Acute intoxication and withdrawal may drive these results, resulting in no significant differences being observed between problematic users and those reporting SUD. Certain forms of substance use disorder may be associated with a higher likelihood of pervasive neurocognitive impairments (i.e., comorbid use of alcohol and other drugs, stimulant abuse; Fernandez-Serrano et al., 2011). The lack of distinction by type and

lifetime duration of substance use in the current study may have contributed to the larger variance within the problematic use and SUD groups, making it difficult to observe statistically significant differences between those with substance use disorder and problematic users. Alternatively, parent characteristics such as impulsivity or dysregulation, associated with their decision to use substances at varying levels, may act as a confounding variable that explains this observed gradation in frequency of emotionally abusive behaviors across substance use behavior patterns (Matusiewicz et al., 2013; Tarter et al., 2003).

Neglect

For neglect, SUD was the only substance use category that had a predictive margin greater than abstainers/ex-users. However, only one hypothesis was supported, that parents reporting SUD were associated with a significantly higher expected frequency than those in recent recovery. These results are consistent with the lack of associations observed between light drinking and various supervisory neglect behaviors (Freisthler, Johnson-Motoyama, & Kepple, 2014) and studies focusing primarily on the positive association observed between SUD and neglect outcomes (e.g., Chaffin et al, 2004; Dunn et al., 2002; Sedlak et al., 2010).

Using a social information processing lens, it may be that chronic failure to meet the basic physical, supervisory, and emotional needs of a child requires more pervasive impairments associated with prolonged, heavy use (Crittenden, 1993; Fillmore, 2012). These differences in patterns observed across types of maltreatment could suggest that maltreatment type arises from different types of impairments in social information processing, with neglect chronicity being attributable to pervasive impairments associated with SUD and abuse chronicity being attributable to impairments arising from any current substance use. Alternatively, it could be that measures for neglect used in the CTSPC required a higher threshold of impairment compared with abuse behaviors to occur multiple times (i.e., leaving child home alone versus calling a child dumb or lazy; Straus et al., 1998).

Research Question 3: Is perceived social support type associated with frequency of child maltreatment type?

Resource-Based Supports

The results support the hypothesis that a high number of resource-based supports on average will have a lower frequency of neglect compared with those reporting a low number of resource-based supports, on average. This is consistent with prior observations of a negative relationship between all forms of resource-based supports and neglect outcomes (e.g., Coohey, 1996). Surprisingly, there were no significant associations observed between resource-based support level and all other frequencies of child maltreatment type. These findings diverge from prior literature that suggests they should be protective of general maltreatment and physical abuse behaviors (Berlin, Appleyard, & Dodge, 2011; Coohey, 2000; Freisthler, Holmes, & Price Wolf, 2014); however, the majority of these studies assessed occurrence of physical abuse as opposed to frequency (Berlin, Appleyard, & Dodge, 2011; Coohey, 2000). That said, Coohey (1996) observed that mothers with abuse-related CPS involvement had lower levels of received emotional support but not tangible support compared with mothers without CPS involvement.

Within the framework of social information processing models of abuse and neglect, resource-based supports may not be associated with parent functioning specific to later stages (e.g., disinhibition and/or self-regulation) that are most important for abuse behaviors (Milner, 1993, 2000). In contrast, resource-based supports may be sufficient to improve functioning in stages that are important for neglect outcomes, such as compensating for parent distraction by directly meeting basic child needs or by providing cognitive/emotional support to ensure child needs can be met (Crittenden, 1993; De Paul & Guibert, 2008).

The resource-based supports measure was weighted more towards parents' perceptions that tangible needs could be met, which may also align better with neglect outcomes (Coohey, 1996). It may be that specific forms of resource-based supports such as cognitive aid and emotional support can better mitigate general maltreatment and abuse behaviors (Coohey,

1996). For example, a high number of people who can assist with transportation can increase the likelihood that the child will be taken to a doctor when needed; however, this particular resource may do little to decrease caregiver disinhibition or to improve self-regulation. In contrast, a high number of people providing help problem-solving about child behavior issues or emotional support that build a parent's confidence in implementing non-violent discipline strategies can lower the times a parent could default to aggressive verbal or physical discipline strategies. Alternatively, it is possible that even when cognitive aid was provided at high levels within this study, the identified individuals did not provide constructive parenting advice that could mitigate abuse behaviors (Cohen et al., 2000; Thompson, 2014).

Social Companionship

There were no hypothesized main effects for any type of child maltreatment frequency regressed on social companionship, and this study observed no relationship between social companionship and any dependent variable in the full models addressing RQ3. These results are not surprising, given the mixed results observed between social companionship and child maltreatment outcomes in prior studies (Coohey, 1996, 2008; Fresithler, Holmes, & Price Wolf, 2014; Lesnik-Obserstein, Koers, & Cohen, 1995). These results do not exclude the possibility that a relationship between social companionship and child maltreatment frequencies may still exist. It is possible that moderating variables, such as the norms towards parenting, could help address variability of child maltreatment behaviors within different levels of social companionship (Baumeister & Leary, 1995; Kawachi & Berkman, 2001), or that a more comprehensive measure of social companionship beyond individuals providing opportunities for social recreation could better capture this relationship (Warde et al., 2005).

Research Question 4: Does perceived social support type moderate the relationship between parent substance use patterns and frequency of child maltreatment behaviors?

General Maltreatment

Contrary to the hypothesized relationship, there were no significant interactions observed for general maltreatment frequencies. Prior research examining the role of social support in child maltreatment behaviors among substance-using parents does not include studies assessing general maltreatment measures. It may be that social support type matters differently for different forms of maltreatment, which get conflated in a summary measure such as general maltreatment. Differences observed in the prior sections across types of maltreatment behaviors suggest this is likely to be the case.

Physical Abuse

Resource-based supports. Findings for the association between physical abuse and an interaction between resource-based supports and substance use patterns were contrary to hypothesized directions. At low and high levels of resource-based support, no statistically significant differences were observed across substance use patterns. Surprisingly, moderate levels of resource-based supports were associated with significantly higher frequencies of physical abuse for all current use groups (i.e., non-problematic use, problematic use, and SUD). These findings differ from prior work that suggests that low levels of resource-based supports were associated with higher physical abuse frequency among alcohol-using parents (Freisthler, Holmes, & Price Wolf, 2014). However, the current study directly examined the interaction among parent substance use, social support type, and physical abuse frequency which may explain variations in findings.

Social information processing models of abuse and neglect may help to explain these findings. For instance, parents engaging in moderate levels of resource-based supports may also engage in risky use behaviors without enough support to fully protect children from

substance-related impairments in parent's neuropsychological functioning (Milner, 1993; Zinberg, 1984). For example, parents may have supports who will provide child care while they are using substances but not long enough to cover the time periods where they are still intoxicated and/or experiencing withdrawal symptoms (e.g., hungover). In contrast, high levels of resource-based supports may provide more consistent protection for children from parent neuropsychological impairments in a way that aligns with no significant differences observed across substance use groups. Alternatively, low levels of supports may be protective for use groups by isolating parents from supports that increase conflict or interpersonal stress that can compromise neuropsychological functioning (Thompson, 2014). Further research on the nature of supports and how they affect parent functioning is required to better understanding these findings.

Social companionship. Contrary to my hypotheses, there were no significant interactions found between parent substance use patterns and social companionship levels for physical abuse frequency. In addition to differences described in the prior section, divergence in findings around social companionship in this study from prior findings reported by Freisthler, Holmes, and Wolf (2014) may be due to this study not incorporating any measures of the ecological context (i.e., alcohol environment). It is likely that the role of social companionship in the creation of physical abuse behaviors involves a complex interaction between parent characteristics, substance use behaviors, social companions, and social/environmental context (Freisthler, 2011).

Emotional Abuse

Contrary to the hypothesized relationship, there were no significant interactions observed for emotional abuse frequencies. No prior work explicitly looks at the relationship between social and emotional abuse behaviors with a substance-using population. Applying social information processing models of abuse and neglect, it may be that resource-based supports and social companionship are not associated with specific social processing stages

that contribute to the frequency of verbally aggressive behaviors (Milner, 1993, 2000). Alternatively, heterogeneity within each type of social support regarding the conflictual nature of relationship (Thompson, 2014) or prosocial norms around emotionally abusive behaviors (Baumeister & Leary, 1995; Kawachi & Berkman, 2001) may have contributed to no significant moderating relationship being observed.

Neglect

Resource-based supports. While the main effect for resource-based supports remained significant, the interaction between resource-based supports and substance use patterns was not statistically significant for neglect. Contrary to my hypotheses, high levels of resource-based supports were associated with a lower expected frequency of neglect compared with low to medium levels *regardless* of parent substance use pattern. All groups appeared to benefit from high levels of resources. It is likely that resource-based supports may help to protect against factors associated with neglect risk that may affect all substance use patterns to some extent, such as stress (Belsky, 1984, 1993; Bronfenbrenner, 1986; Cohen & Wills, 1985; Rodriguez & Tucker, 2014). Please refer to RQ3 for a detailed discussion of the direct relationship between resource-based supports and neglect frequency.

Social companionship. The results did not directly support my hypotheses. At high levels of social companionship, no statistically significant differences were observed. Moderate levels of social companionship (as opposed to high levels of social companionship) were associated with a higher expected frequency of neglect for parents reporting SUD compared with those reporting non-problematic use or problematic use. At moderate levels of social companionship, chronicity of neglect is exacerbated for parents reporting SUD because of a combination of factors associated with parents' compromised neuropsychological functioning and increased opportunity to socialize away from the family (Coohey, 2008; Warde et al., 2005), increasing the likelihood of parents being distracted from attending to and addressing their child's needs (Crittenden, 1993).

Surprisingly, the results suggest that higher levels of social companionship were associated with lower expected frequency of neglect among problematic users. Moderate levels of social companionship may provide social contacts that buffer stress experiences through providing feelings of belonging, resulting in potential improvements in neuropsychological functioning (Cohen et al, 2000; Goodman et al., 2013; Hostinar et al., 2014; Raio et al., 2013; Taylor, 2011) for individuals reporting current heavy drinking and/or illicit drug use without associated problems in functioning. Within-group differences not measured by the current study (e.g., frequency of heavy drinking or illicit drug using) may also help to explain differences observed between low and moderate levels of social companionship for problematic users. For example, harms related to heavy drinking are likely to differ significantly for the occasional heavy drinking (i.e., on special occasions) or regular heavy drinking (i.e., weekly consumption of high levels of alcohol) associated with substance use disorders (WHO, 2000). Parents who are more isolated may be engaging in moderate to frequent episodes of heavy drinking whereas parents with more social contacts may only be engaging in infrequent heavy drinking during social situations and/or special occasions (Bourgault & Demers, 2006). These findings should be viewed cautiously, given that social companionship was measured using one item related to the number of people the parent could count on to invite him/her to go out and do things (Dowd et al., 2008) and excluded essential information about the specific norms and behaviors associated with these social companions (Thompson, 2014; Tracy et al., 2012).

Strengths and Limitations

Strengths

This study had several strengths. First, NSCAW was a national survey of a high-risk sample for child maltreatment behaviors. The large sample size plus higher likelihood of maltreatment behaviors provided sufficient power for most of the analyses. The current study also applied national survey weights to reduce bias in the estimates and better reflect the U.S. child welfare population; these weights were used in conjunction with analytic methods for

surveys that allowed me to evaluate a subgroup of the full sample while also correctly estimating the variance (Biemer et al., 2008; Dowd et al., 2008; StataCorp, 2013). NSCAW also used automated computer-assisted self-interviewing (ACASI) technology for all key independent and dependent variables (e.g., substance use, social support, and child maltreatment outcomes), which may help to minimize social desirability bias in reporting taboo or high-risk behaviors (Turner et al., 1998).

This dataset also allowed me to address several gaps in the literature through more detailed operationalization of all key independent and dependent variables. In addition, all variable construction was theoretically driven (e.g., Cohen & Wills, 1985; Crittenden, 1993; Milner, 1993, 2000). For substance use behavior patterns, the presence of multiple waves of data allowed me to construct substance use behaviors patterns informed by use patterns in the prior 4 years while minimizing recall bias (Coughlin, 1990). These approach utilized historical behavior in a new way to construct a continuum of substance use behaviors associated with different levels of neuropsychological impairments and varying levels of treatment needs (Fernandez-Serrano et al., 2011; Fillmore, 2012; SAMHSA, 2012). The social support measures discriminated between two distinct types of supports—resource-based supports and social companionship—given some evidence that social companionship may not always be protective (Cohen & Wills, 1985; Freisthler, Holmes, & Price Wolf, 2014). Child maltreatment behaviors were studied in more detail by operationalizing maltreatment as frequency of behaviors, assessing types of maltreatment independent from the umbrella construct of general child maltreatment, and analyzing annual behavior frequencies using statistical procedures that addressed the skewed distribution of these behaviors (i.e., NBRM). This study also examined interactions among substance use and social support that built upon prior work that explored how the social environment may mitigate or exacerbate substance-related harms (Freisthler, Holmes, & Price Wolf, 2014; Zinberg, 1984). Finally, the use of multiple comparisons was important for understanding the relationship across categorical groups but increased the

likelihood of type I error. The application of Holm's Bonferroni corrections helped to minimize type I errors within the study. In combination, a more nuanced and detailed story begins to emerge about a continuum of risk for maltreatment behaviors as opposed to a predominant binary approach to these issues within the child maltreatment research literature and field.

Limitations

Several study limitations influence the generalizability and application of these conclusions. First, NSCAW I is an older survey (administered from 1999 to 2007); however, it included the best data available at the time of this study to construct substance use behavior patterns, social support type, and child maltreatment frequencies. In addition, the original study sample is drawn from a high-risk child welfare population. While survey weights were applied, it does not take into consideration those individuals in the general population who do not have contact with this system (Dowd et al., 2008). The study sample also suffered from a large amount of attrition from changes in key respondents and caregiver status across waves. As a result, the final analytic sample excludes children with nonpermanent caregivers and parents experiencing informal or formal child removal during the timeframe of the study. Parents in the study tended to be younger in age, female, identify as a biological parent, have no prior history of child removal, and have higher frequencies of child maltreatment (driven by neglect incidents) at baseline.

Limitations in generalizability suggest the findings are likely to be specific to a narrow range of the general population. First, the study sample was almost all female suggesting the results may be more relevant for understanding the relationship between substance use, social companionship, and child maltreatment behaviors among mothers. Second, there is a higher likelihood that this sample is composed of families already struggling with existing problems and/or surveilled by other systems that brought them to the attention of CPS. In addition, the relationships observed in this study may differ from the general population of parents. For example, it may be that non-problematic users have added risk for physical and emotional

abuse when other problems are present but not for families with low levels of stress and/or identified problems. However, one study using a general population sample did demonstrate higher frequency of physical abuse among light and moderate drinkers compared to lifetime abstainers (Freisthler, Holmes, & Price Wolf, 2014). Second, the selection criteria results in lower likelihood that families experiencing the most severe forms of maltreatment that require child removal would be captured by the study sample. While SUD likely contributes to higher maltreatment risk across the general population, the lack of difference observed between parents reporting SUD and problematic use may also be due to the current sample capturing a higher frequency of less severe forms of maltreatment. In others words, significant differences between these groups may be present for more severe forms of maltreatment and should be further explored.

Several limitations also arise due to the study design being a cross-sectional, secondary data analysis. First, the cross-sectional nature and an annual timeframe for behaviors to occur can only highlight associations that may not be causal. In addition, the secondary analysis limits the variables available given the survey was not design to specifically answer this study's research questions. Second, parent neuropsychological functioning was not measured; this functioning and presumed influence on social information processing of abuse and neglect were only used to guide the formation of this study. Several other important parent variables were omitted from the study because no comprehensive measures were available: prior trauma, substance use history prior to W1, baseline cognitive functioning, impulsivity/disinhibition, and stress. However, the most prevailing parent risk factors discussed by prior studies (e.g., parent arrest history, mental health, and service history) were included as controls within all final models (e.g., Brown et al., 1998; Dunn et al., 2002; Dubowitz et al., 2011; Gregoire & Schultz, 20001; Grella et al., 2009). Finally, the self-reporting of child maltreatment behaviors may not have been fully mitigated by ACASI procedures given that parents were informed that

researchers were still held accountable to mandated reporting laws; this design issue may have resulted in an underestimate of more severe maltreatment behaviors (Dowd et al., 2008).

Limitations also exist for how the key independent and dependent variables were operationalized. First, general maltreatment excludes sexual abuse behaviors, given that specific behaviors enacted by the respondent were not asked. In addition, measures of severity for all maltreatment outcomes were excluded; this study helps to understand the chronic nature (i.e., frequency) of maltreating behaviors but does not differentiate in their potential for resulting in irreparable harm to a child (Herrenkohl, 2005). The substance use measures provide gross measures of intensity, considering that there is no specific measure on the type of drug, duration of heavy use, and simultaneous polysubstance use (Dawson & Room, 2000; Ives & Ghelani, 2006; Mayes & Truman, 2002). In addition, more precise measures may be needed to distinguish between problematic and SUD groups, especially as many observed differences were not statistically significant due to large variance within these groups. This lack of difference could also be due to recall bias for groups associated with higher memory impairment, resulting in potential under-reporting in groups associated with higher intensity of use (Coughlin, 1990). The sample size for parents in recent recovery was small (n = 76), included parents reporting SUD anywhere from 1.5 to 4 years prior to Wave 4, and combined parents who were currently abstinent and light or moderate drinkers to achieve even this small sample size. As a result, the category for parents in recovery may experience (a) limited power to demonstrate significant differences with other groups and (b) heterogeneity within the group, increasing variance. These relationships between substance use behaviors and child maltreatment frequencies also may be spurious relationships that are better explained by tendencies towards deviant behaviors; however, the full models attempted to address this issue by controlling for prior arrest history and CPS service history (Brown et al., 1998; Grella et al., 2009).

The Social Support Scale was not originally designed to measure specific types of social support. As a result, an average was taken for resource-based supports given potential

duplication of sources of support across items; however, this procedure may underestimate the number of individuals providing supports given the use of an average assumes duplication across specific items. Also, social companionship was measured by one item—people to do things with—limiting the measure to recreational contacts rather than the full range of social interactions associated with this concept (Cohen & Wills, 1985). Finally, the social support measures did not measure the environmental context that may influence the nature of social interactions (Freisthler, Holmes, & Price Wolf, 2014) or within-network specifics that may influence its relationship with child maltreatment frequencies, such as interpersonal conflict or substance-related behaviors (Thompson, 2014; Tracy et al., 2012).

Because of concerns about power, age-specific analyses that captured different developmental stages of the children were not conducted. Frequencies of maltreatment are likely to differ by developmental age for both children, and child age remained statistically significant within all models except physical abuse. In addition, the current study sample focused primarily upon younger parents with older parents (age 45+) being lost to attrition. Parent age may be an important factor not captured by the current study sample, especially in light of research that indicates child maltreatment (Brown et al., 1998), substance use behaviors (SAMHSA, 2011), and social connections decrease with age in adulthood (Wrzus, Hanel, Wagner, & Neyer, 2013). Finally, the final models had to truncate the substance use behavior categories by folding those in recovery with the appropriate ex-user or light/moderate drinker categories because of the very low cell sizes associated with this group. However, observed relationships remained stable even after truncating categories for the final model.

Implications for Social Work Policy and Practice

Substance-using populations are one of the more difficult populations to treat and to retain in treatment (Dutra et al., 2008; Ryan, Plant, & O'Malley, 1995), likely contributing to poor child welfare outcomes for families with substance-using parents (Marcenko, Lyons, & Courtney, 2011; US DHHS, 1999; Zuravin & DePanfilis, 1997) and potentially high levels of

conflict within informal arrangements in families (Barnard, 2003). In fact, Thompson (2014) indicated that social support interventions (as currently designed) may not be sufficient to address the needs of this particular population. The current study suggests that this population may require more tailored interventions to address the wide range of parenting needs along a continuum of use behaviors and within different social contexts.

Substance use occurs on a continuum, and the findings from this study suggest this continuum of behaviors is likely to have different implications for different types of child maltreatment behaviors. Application of substance use treatment models (like Screening, Brief Intervention, and Referral to Treatment [SBIRT]; SAMHSA, 2012) may be appropriate to target problematic parenting behaviors among substance-using populations outside the child welfare system to potentially reduce the higher likelihood of involvement in this system (Drabble, 2007; Young, Boles, & Otero, 2007). For example, social workers should consider universal screening approaches that assess general substance use behaviors among parents, including light or moderate drinking, with an emphasis on current use behaviors. Second, parents with *any* substance use may benefit from education of potential harms arising from their use, such as increased risk for physically and emotionally aggressive behaviors. Finally, parents with problematic use behaviors (particularly SUD) may benefit from targeted interventions to improve parenting practices that can reduce potential chronicity of all forms of maltreatment behaviors consistently observed across these groups. For families currently in child welfare settings, collaborative models between child welfare and alcohol and other drug treatment systems may be useful to combine understanding across disciplines in how to address this continuum of behaviors (Osterling & Austin, 2008).

In addition, social workers should take social support into consideration when assessing parenting practices and potential for child harm. Specifically, assessment of the nature of these relationships and how they influence parenting behaviors is critical. Findings from this study suggest that resource-based supports and social companionship can either mitigate or

exacerbate risks for physical abuse and neglect, depending on a variety of factors. In-depth assessment of how these supports work to improve parent functioning and protect children is essential for differentiating families with and without social rituals in place to protect children from substance-related harms (Thompson, 2014; Zinberg, 1984).

These findings can provide insight into why parents social support interventions alone may not be effective for families with complex issues, such as parent substance use disorder (Thompson, 2014). First, attention to the type of social support in which parents engage is essential since we cannot assume all types of social support are protective, especially among substance-using parents (Freisthler, Holmes, & Price Wolf, 2014; Thompson, 2014). Second, interventions that focus on assisting substance-using parents to discern between supports that discourage high-risk behaviors (or at least mitigate the effects for children) may help parents to engage their networks in a different manner. Alternatively, parents may need connections and/or engagement with informal support systems to radically transform their social networks. For example, individuals participating AA or other self-help groups that display changes in their social network are associated a higher likelihood of engaging in health-promoting behaviors (Kelly et al., 2011; Nealon-Woods et al., 1995). These treatment models are useful examples for how social workers might think about promoting low-cost, informal social groups aimed to improve parental functioning.

Directions for Future Research

The results of this study suggest several potential pathways for future research. First, timing of parents' most recent experience of SUD varies widely within the current study (current to 4 years ago), which may have contributed to large variances observed for both SUD and recent recovery groups. Longitudinal statistical approaches would provide more precise timing (past 12 to 18 months) for how current and past use behaviors contribute to current child maltreatment frequency.

In addition, future studies can improve upon current measures of parent substance use, social support type, and child maltreatment outcomes. For substance use, more precise measurement of use behaviors such as type of primary substance used, single substance versus polysubstance use, frequency of use, quantity of use, duration of use, and age at onset of use may address observed heterogeneity within groups (Mayes & Truman, 2002; Room & Dawson, 2000). In addition, social support measures designed to capture distinct elements of resource-based versus social companionship may help to further illuminate the distinct roles of these types of support in the development of problematic parenting behaviors (Cohen et al., 2000). Finally, future studies may also consider comparing child maltreatment measures along a continuum of potential outcomes (i.e., occurrence, frequency, and severity) to assess how different substance use and social support types are associated with different features of these parenting behaviors (Herrenkohl, 2005; Litrownik et al., 2005; Manly, 2005).

Studies designed to measure neuropsychological impairments and child maltreatment behaviors directly would better test social information-processing models of abuse and neglect and provide insight into the underlying mechanisms that may help to explain differences observed between groups (Crittenden, 1993; Milner, 1993, 2000). In addition, over-sampling by type of substance use pattern may be required to obtain enough power to compare groups with lower rates in the population, such as those in recovery. This study also excludes important contextual information about substance use behaviors and characteristics of individuals within a parent's social network that may be important moderating or mediating factors for parenting behaviors (e.g., Freisthler, 2011; Freisthler, Holmes, & Price Wolf, 2014). Finally, variation observed across specific types of maltreatment behaviors suggests the important of studies examining the processes contributing to specific forms of maltreatment, such as neglect, to better tailor intervention needs for difficult-to-treat populations.

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