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Predicting Post-Treatment Recurrence Of Child Maltreatment Among Substance-Abusing Parents

Emily Noel Neger
University of South Carolina

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PREDICTING POST-TREATMENT RECURRENCE OF CHILD MALTREATMENT
AMONG SUBSTANCE-ABUSING PARENTS

by

Emily Noel Neger

Bachelor of Arts
Tufts University, 2009

Master of Arts
University of South Carolina, 2015

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Accepted by:

Ron Prinz, Major Professor

Kate Flory, Committee Member

Alberto Maydeu-Olvaes, Committee Member

Robert Brame, Committee Member

Cheryl L. Addy, Vice Provost and Dean of the Graduate School

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ABSTRACT

Approximately one quarter of parents identified by Child Protective Services (CPS) as having committed child maltreatment will be reidentified within a year. Children who are multiply victimized are at the greatest risk for detrimental outcomes across development. This study looked to determine whether four predictors of interest could help differentiate parents who recommitted maltreatment within an 18-month follow-up period from those who did not. Predictors assessed were the severity of a parents' substance use, parents' level of social conflict, parents' belief in the use of harsh parenting practices and parents' overall quality of life. Covariates of interest included a parent's age, race, monthly income, education level and the number of children in the home. This study used a sample of 117 parents of children ages 2 to 8 years who had open CPS cases for substantiated child maltreatment as well as substance use concerns. Analyses consisted of binary logistic regression. Results indicated that parents' belief in harsh parenting practices significantly predicted child maltreatment recurrence, $\chi^2(1, n=117) = 3.78, p=.046$, with each standard deviation increase in belief in harsh parenting associated with an increase of 1.54 in the odds of maltreatment recurrence. Number of children in the home was also a significant predictor, $\chi^2(1, n=117) = 4.00, p=.045$, with each additional child in the home increasing the odds for maltreatment recurrence by a factor of 1.50. There was also a significant interaction effect such that for families with fewer children, belief in harsh parenting had a smaller effect on the probability of recurrence than in families with more children.

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CHAPTER 1. INTRODUCTION

Recurrence of child maltreatment after parents have been identified by social service agencies is common (Drake et al., 2003). Recent research has found that after a substantiated case of physical abuse or neglect, children are likely to be re-victimized by their parents at rates ranging from 20% within 18 months to 40% within four years (Bae et al., 2010; Cheng & Lo, 2015). Data from a 2010 U.S. Department of Health and Human Services report indicate that, each year, approximately 25% of families with previously substantiated maltreatment cases are identified for maltreatment again (Proctor et al., 2012). Furthermore, past incidence of maltreatment remains one of the strongest predictors of future maltreatment (DePanfilis & Zuravin, 1999; Fuller & Wells, 2003; Hindley, Ramchandani & Jones, 2006; Sledjeski, Dierker, Brigham & Breslin, 2008).

Cases of maltreatment recurrence cost child protective service (CPS) agencies seven times more than cases without recurrence (Proctor et al., 2012), and children who are multiply victimized show the poorest developmental outcomes, including increased rates of behavioral problems, emotional difficulties and delinquency (Staton-Tindall et al. 2013; Proctor et al., 2012; Solomon & Asberg, 2012).

Many factors within the ecological system have been studied in relation to risk for maltreatment recurrence. Among the factors studied, those that appear most robustly associated with recurrence of child maltreatment include: parental substance abuse (Casanueva, Tueller, Dolan, Testa, Smith, & Day, 2015; Cheng & Lo, 2015; Fluke et al.,

2008; Proctor et al., 2012), parental stress (DePanfilis and Zuravin, 1999), parents' level of social support (Casanueva et al., 2015; DePanfilis and Zuravin, 1999; Proctor et al., 2012), the number of children living in the home (Bae, Solomon and Gelles, 2009; Proctor et al., 2012), low socioeconomic status (Drake and Pandey, 1996; Gillham, Tanner, Cheyne, Freeman, Rooney, and Lambie, 1998; Pereira, Negrão, Soares and Mesman, 2015), low parental educational attainment, younger parent age status (Brown, Cohen, Johnson, and Salzinger, 1998), younger child age (Bae et al., 2009) and child developmental disability status (DePanfilis, & Zuravin, 2002; Fluke et al., 2008).

While the above factors have provided some direction for assessing risk, case workers still struggle to identify which families are at greatest risk for recurrence. In a study of caseworkers' abilities to assess risk for maltreatment recurrence using a nationally representative dataset of over 2,000 families, Dorsey et al. (2008) found that caseworkers were only slightly better than chance at predicting which families would have recurrence. Implications of this finding are notable given that the primary function of CPS is prevention of ongoing maltreatment (Drake, Jonson-Reid, Way, & Chung, 2003). CPS agencies are traditionally under-funded and must make difficult decisions regarding how to best distribute their limited resources.

Past research on child maltreatment has centered around two nationally representative surveys, the National Child Abuse and Neglect Data System (NCANDS) and the National Survey of Child and Adolescent Wellbeing (NSCAW II) (Fluke, 2008). The NCANDS is based on a federal reporting system that receives data from all investigated cases of suspected child maltreatment from child welfare agencies across all 50 states, Washington DC and Puerto Rico, annually. NSCAW II is a dataset collected

on a cohort of 5,872 children age birth to 17.5 years across 83 counties between February 2008 and April 2009 who were involved in both substantiated and unsubstantiated investigations of maltreatment. A number of methodological limitations regarding the NCANDS and NSCAW II datasets should be noted. In both data sets, variables of interest such as parental substance abuse and social support were dichotomized rather than measured on a continuum. For example, in the NSCAW II study, data was collected via caseworker interview. Caseworkers were asked of each family “Was there low social support?” and “Was there active alcohol or drug abuse by the caregiver?” Beyond the potential to introduce reporter bias by having third parties report on the family’s functioning, phrasing the survey items as dichotomous yes/no questions leaves significant room for subjective responding and does not capture the degree or extent of parent’s social support or substance use concerns. Furthermore, these large heterogenous surveys have not investigated the relative predictive value of the different risk factors assessed.

The current study looks to contribute to knowledge in this area by using a prospective design to assess the role of four potential predictor variables in differentiating cases that are re-identified by CPS for child maltreatment recurrence during an 18-month follow-up period from those that are not. The study utilizes nuanced measurement of potential predictors in a unique population of parents with co-occurring open CPS cases for child maltreatment as well as substance abuse concerns severe enough to warrant treatment in an intensive outpatient rehabilitation program.

While including only parents with both open CPS cases and substance abuse concerns may limit the generalizability of the outcomes across a more general sample, the co-occurrence of substance abuse and child maltreatment is the rule more than the

exception. According to the National Center on Addiction and Substance Abuse (2005), up to 70% of child maltreatment cases involve parental substance abuse. Parents with substance abuse concerns often face additional challenges and have unique needs when it comes to mitigating risk for maltreatment recurrence (Neger & Prinz, 2015).

Furthermore, while parental substance abuse is consistently recognized as among the most robust risk factors for child maltreatment (Staton-Tindall et al., 2013), little research has looked at what differentiates parents with substance-abuse concerns who maltreat or repeatedly maltreat their children from those who do not. The current study looks to contribute to our knowledge in this area and to help elucidate the specific needs of this particularly high-risk population.

Specific factors of interest examined in this study are: 1) severity of parental substance abuse, 2) level of parental social conflict, 3) parental belief in punitive parenting practices, and 4) overall parental quality of life. These predictors were chosen as they represent possible targets of intervention. Other factors that have been found to relate to involvement with CPS for child maltreatment but lack malleability were included in the current analyses as covariates. These include parent race, parent income, parent education attainment, number of children in the home and parent age at enrollment. Greater understanding of how these factors contribute individually and collectively to the recurrence of child maltreatment in this population may inform future avenues of research and improve prevention and intervention services. Background on the connection between each of these factors and child maltreatment is provided below.

1.1 Substance Abuse and Child Maltreatment

Parental substance use has consistently been identified as among the most robust influences for both initial incidence and recurrence of child maltreatment. Research has regularly found that parents with substance abuse disorders are at greater risk of engaging in maltreatment (Fuller and Wells, 2003). Specific data indicate that such parents are approximately three times more likely to physically abuse their children and four times more likely to neglect their children than are parents who do not abuse substances (Chaffin, Kelleher, & Hollenberg, 1996; Murphy, Jellinek, Quinn, & Smith, 1991; Ondersma, 2007). Substance abuse has been found to be a factor in more than 70% of reported cases of maltreatment (National Center on Addiction and Substance Abuse, 2005; Staton-Tindall, Sprang, Clark, Walker, & Craig, 2013) and is among the most common factors found in studies of recurrence (Fluke, 2008).

There are a number of proposed explanations for the connection between parental substance abuse and risk for child maltreatment. In terms of physical abuse, substance use has been found to lower a parent's ability to regulate impulses, control anger, handle frustration and cope with negative emotional states in adaptive ways (Borelli, West, DeCoste, & Suchman, 2012). Under the influence of alcohol or illicit drugs, parents may struggle to separate their feelings of anger towards their situation from anger towards their child (Dunn et al., 2002; Suchman, DeCoste, Leigh et al., 2010). Compared with their non-substance-abusing counterparts, parents with substance abuse disorders have been found to engage in harsher and more hostile parenting characterized by reduced warmth and sensitivity and increased use of punitive parenting practices such as yelling, berating and corporal punishment (Kelley, Lawrence, Milletich, Hollis & Henson, 2015;

Stanton-Tindall, 2013; Suchman, DeCoste, Castiglioni, Legow, & Mayes, 2008). During times of acute intoxication or withdrawal, parents may escalate to physical abuse due to their reduced impulse control and lack of cognitive capacity to consider the consequences of their actions.

In terms of neglect, the neurological effects of substance abuse have been shown to diminish a parent's ability to recognize and respond to his or her child's emotional and physical needs. Periods of intoxication or withdrawal can impair a parent's emotional and cognitive availability (Kelley et al. 2015) such that parents do not respond quickly or effectively to a child's cries for help. Furthermore, the addictive nature of alcohol and illicit substances may render parents unable to prioritize fulfilling their child's needs over procuring drug fixes (Barnard & McKeganey, 2004; Lussier et al., 2010; Dunn et al., 2002).

While parents may intend to care for and provide for their children, they may be physically unable to do so due to the chemical effects of drugs. Neurologically, drug states have been shown to corrupt the motivational center of the brain through altering the sensitivity of dopamine receptors in the nucleus accumbens. With repeated drug use, the nucleus accumbens becomes so sensitized to the drug stimulus that the user is unable to override the motivation to continue to take drugs via either logic or rationality (Robinson and Berridge, 2003).

In studies using functional magnetic resonance imaging (fMRI), researchers have observed naturally-occurring changes in mothers' brains following childbirth that result in heightened sensitivity of the dopamine and oxytocin reward centers that are triggered by signals from the infant such as cooing and crying. This heightened sensitivity makes

performing caretaking behaviors more rewarding (Kim et al., 2015). These same reward pathways have been implicated in substance abuse and it is hypothesized that for mothers who abuse substances, the natural changes in the brain that occur at the transition to motherhood may be co-opted by the effects of the illicit chemicals and may alter the mother's sensitivity to infant cues (Kim and Streathearn, 2015).

Additionally, researchers have theorized that as tolerance escalates such that greater and greater amounts of drug are needed to achieve desired feelings of pleasure, a process known as *allostatic loading*, the threshold for experiencing pleasure on a neurological level, increases. Naturally rewarding activities such as interacting with one's child do not provide sufficient stimulation to compete with the effects of drugs (George, Le Moal, & Koob, 2012). Decreased pleasure garnered from the parent-child relationship may reduce parents' motivation to interact with and care for their children, increasing the risk for abuse and neglect.

In a lab study using rat models, Johns, Nelson, Meter et al., (1998) found that maternal rats who were injected subcutaneously with cocaine at regular intervals after giving birth displayed reduced maternal behaviors towards their pups compared to control group rats and were less likely to protect their pups from an aggressive intruder. They also found a dose effect in which maternal rats who received greater doses of cocaine showed less maternal activity.

Human subject studies have also found that parents with substance-abuse concerns spend less time interacting with their children, are less responsive to their children's cues, and experience reduced pleasure from the parenting role (Johnson,

Morrow, Accornerro, et al., 2002; Mayes & Truman, 2002; Pajulo, Savonlahti, Sourander, Ahlqvist, Helenius, & Piha, 2001).

One potential explanation for this finding suggested by Suchman, DeCoste, Castiglioni, McMahon, Rounsaville and Mayes (2010) is that the demands of parenting cause stress for parents with poor emotion regulation and coping skills. That stress can cause parents to turn to substance abuse as a psychological escape, thus rendering themselves less available to respond to their children's cues. That, in turn, increases children's signaling, leading to more stress and more substance use, creating a maladaptive cycle.

Taken together, there are multiple levels and pathways of influence connecting substance abuse and the risk for child maltreatment. However, it has not been clear how the severity of parental substance abuse difficulties may affect this risk.

1.2 Parent's Social Support and Conflict

The connection between low levels of social support and involvement with the child welfare system has been identified in a growing number of studies (Stith, Liu, Davies, Boykin, Alder, Harris, et al., 2009; Brown et al., 1998; Jackson et al., 1999; Rajendran et al., 2015). Past prospective research has found that, parents involved with the child welfare system reported less social support and less satisfaction with their social support than parents who did not become involved with the child welfare system (Albarracin, Repetto & Albarracin, 1997; Rajendran et al., 2015). The Department of Health and Human Services' Emerging Practices Report (2003) found that mothers who had previously maltreated their children reported diminished social support networks, less contact with friends and low quality of support received from friends.

Dorsey et al. (2008) found that parents with low social support were more likely to re-commit child maltreatment at an increased odds ratio of 1.93 compared to those parents with higher social support. Interestingly, Dorsey et al. (2008) also found that level of social support was often overlooked by case workers when assessing risk for maltreatment recurrence.

One hypothesis for this connection is that parents with low social support receive little socialization regarding healthy parenting practices and have limited buffers on life stresses (Rajendran, K., Smith, B. D., Videka, L., 2015; Thompson, 2014). Chronic stress causes persistent cortisol release which has been found to effect gene expression in multiple brain regions with behavioral consequences such as increased emotional reactivity and reduced cognitive flexibility and self-regulation (Lupien, McEwen, Gunnar, & Heim, 2009). All of those can lead to abuse. Relatedly, Taylor (2011) demonstrated that social contact reduced adults' physiological reactions to stressful situations and enhanced the function of the prefrontal cortex which aids with self-regulation.

In addition, parents with higher levels of social support enjoy greater access to tangible benefits such as help with child care, transportation or financial assistance that increases their likelihood of providing safe and nurturing environments for their children (Dominguez & Watkins, 2003). Kepple (2015) found that increased tangible social support significantly reduced frequencies of both physical abuse and neglectful behaviors among parents.

Other hypotheses on the connection between social support and child maltreatment suggest that reduced social support may be a proxy measure for general

psychological functioning. Individuals who are socially isolated may have mental health or personality problems that involve pervasive distrust of others, hostile attribution biases and other antisocial traits. Such symptomology may contribute simultaneously to social isolation and a propensity for child maltreatment (Thompson, 2014).

In some circumstances, parents may be socially isolated due to a deliberate effort to distance themselves from family members or friends for reasons of disagreement or distrust. Many parents who maltreat their children were victims of maltreatment themselves (Dorsey et al., 2008; Connors et al., 2004) and thus may attempt to disengage from their abusive families of origin. However, these parents may not have the skills, resources or opportunities to establish prosocial networks and may still engage in abuse towards their children because they are unaware of alternative parenting skills or coping mechanisms.

Finally, parents who lack social support may also lack positive social influences to seek out or commit to getting help for substance abuse concerns or stress management (Gregoire & Schultz, 2001). Research has found that both substance abuse treatment services and parenting classes are more effective when individuals are supported by family and friends and encouraged by others to attend sessions (Rajerdran et al., 2015; Neger & Prinz, 2015).

1.3 Belief in Harsh Parenting Practices

The third variable of interest in this study, parents' belief in the use of harsh and punitive parenting practices, was chosen because of the connection between parents' cognitions regarding what is appropriate parenting and how they act towards their children (Jackson et al., 1999). Parents who believe in and utilize harsh parenting

practices such as corporal punishment, yelling and threatening have been found to be at higher risk for maltreatment (Brown, Cohen, Johnson, & Salzinger, 1998). By definition, corporal punishment is distinguished from physical abuse by the parent's intent. Strauss (1994) defines corporal punishment as "the use of physical force with the intention of causing a child to experience pain but not injury for the purposes of correction or the control of the child's behavior." Yet, according to the Department of Health and Human Service's Children's Bureau, physical abuse is defined by outcome. Specifically, "injury ... that is inflicted by a parent, caregiver or other person who has responsibility for the child. Such injury is considered abuse regardless of whether the caregiver intended to hurt the child" (Dept. of Health and Human Services, 2013). Thus, parents who use corporal punishment as a means to correct or control their children but nevertheless injure them, have still engaged in abuse.

While parents may not intend to physically harm their children, their use of corporal punishment can readily escalate to the point of causing injury (Gershoff, 2002), especially when considering that punishment often results in an escalation of undesirable behavior in children rather than improvement. According to Social Learning Theory (Bandura, 1977), children whose parents use harsh parenting strategies often model their parents' methods of dealing with anger and are not taught alternative ways of responding to negative emotions (Gershoff, 2002). Under such circumstances, children's undesirable behaviors continue, and parents' frustration grows. Parents then often intensify their use of harsh parenting strategies, resulting in escalating child misbehavior and an increased risk that abuse will occur, especially if parents resort to physical punishment at times of great anger and irritation (Jackson et al., 1999). One study found that in as many as two

thirds of physical abuse cases, parents reported that the incidents began as an attempt to control their children's unwanted behavior (Coontz & Martin, 1988; Gershoff, 2002). The association between corporal punishment and abuse has become so robust that researchers in the field have begun to consider the relationship as existing on a continuum rather than as discrete categories of parenting (Gershoff, 2002).

In a 2000 study, Crouch and Behl found that parenting stress was related to likelihood of maltreatment only for those parents who believed in the use of corporal punishment techniques. This suggests that parenting beliefs are a significant contributor to maltreatment, beyond the role of stress. According to Social Information Processing theory (SIP), child abuse does not occur based on the severity of child behavior or a parent's stress in the moment alone. Rather, parents come to each new conflict with a pre-set schema regarding what forms of discipline are acceptable and apply these beliefs in the course of the interaction (McElroy & Rodriguez, 2008; Rodriguez & Richardson, 2007). Thus, parents who believe that the use of harsh punishment strategies is acceptable are more likely to access this schema during conflicts than parents who do not hold these beliefs prior to the conflict.

In terms of child abuse recurrence, one study by Sledkeski et al. (2008) found that among families with a history of substantiated child maltreatment, parents' skills and expectations for their children were a significant factor in predicting who would engage in repeated child abuse within 18 months after the initial incident.

1.4 Quality of Life

In recent years, a global construct of overall functioning across multiple life domains has been adopted by many researchers and labeled Quality of Life (QoL) (The

International Society for Quality of Life Research, 1993). This construct covers multiple factors within the ecological system, such as one's physical health and wellbeing, economic stability, relationship satisfaction, occupational and leisure satisfaction and satisfaction with one's home, neighborhood and overall community.

Past research has suggested that rather than any one risk factor in particular, an accumulation of multiple stressors may be most predictive of initial child maltreatment occurrence (Brown, Cohen, Johnson, & Salzinger, 1998; Nair, Schuler, Black, Kettinger & Harrington, 2003). It follows, therefore, that reduced QoL across multiple domains may be a robust predictor of child maltreatment recurrence as well. As such, quality of life is included in the current study to be explored as a potential risk factor.

1.5 Relationships Among Predictors

Correlations among the above predictor variables will be examined as it is reasonable to hypothesize potential relationships between them. For example, higher levels of substance use may strain an individual's social support networks if drug use causes rifts in family and close relationships (Kepple, 2015). Additionally, parents with low social support may turn to substance abuse to cope with stress if they do not have supportive others to help them manage. Alternatively, social support may reinforce substance abuse if parents are using alcohol or drugs as a way to socialize with others who encourage rather than discourage this behavior (Kepple, 2015, Tracy, Laudet, Min, et al., 2012).

In addition, higher levels of substance use may correlate with diminished quality of life scores across multiple domains. For example, substance abuse may interfere with employment satisfaction if individuals are unable to secure or maintain jobs and may

diminish financial security if money is being spent on drugs and alcohol, lowering QoL ratings in these areas (Staton-Tindall, 2013). A high level of concordance is also likely among the measures of social support and quality of life as satisfaction with social and family relationships are included in the quality of life construct.

Finally, research on the connections between social support and parenting practices has shown somewhat unexpected patterns. For example, some parents who have supportive social networks report that they are more likely to use harsh parenting practices (Lyons, Henly & Schuerman, 2005), while others report they are more likely to engage in positive parenting behaviors (Green, Furrer, & McAllister, 2007).

1.6 Covariates

The covariates of interest included in this study are parent's race, family's monthly income, parent level of educational attainment, parent's age and the number of children in the home. These factors were chosen as covariates based on previous research that has found evidence relating each of them to rates of identification and substantiation of child maltreatment. They are separated from the main factors of interest examined in this study due to their lack of malleability from a treatment perspective.

Parent race was included due to previous findings that black families are over-represented in the child welfare system (Drake, Lee and Jonson-Reid, 2009). Among the theorized explanations for this finding are that black families experience higher rates of other risk factors including being three times more likely to live in poverty than white families. Poverty exposes families to additional ecological stressors including neighborhood violence and reduced community resources. Additionally, researchers have theorized that institutionalized racism may play a role such that black families are more

likely to be more closely monitored by social services and are less likely to be given the benefit of the doubt than their white counterparts. Fluke, Yuan, Hedderson, and Curtis, (2003) found that black families were over-represented in cases referred to CPS in the investigation stage but this disproportionality reduced significantly at the substantiation stage.

Family's monthly income was included as a covariate as poverty status has been a robust predictor of child maltreatment in the literature spanning the last three decades (Drake and Johnson-Reid, 2014). Specifically, Sedlack and Broadhurst (1996) found that families with annual incomes below the poverty line are twenty times more likely to be identified for maltreatment than those with incomes above this cutoff. Both individual and community factors are hypothesized to mediate the relationship between poverty and child maltreatment, especially parental stress which may increase reactive and harsh parenting which can lead to physical abuse, and lack of community resources which may contribute to neglect.

Parent's level of educational attainment was also included as a covariate as previous research has found that parents with lower educational attainment are more likely to engage in child maltreatment (Sidebotham and Golding, 2001). Specifically, Brown et al., (1998) found that in a representative sample of 644 parents, those without a high school degree were two times as likely to be identified for child maltreatment as parents who completed high school.

Parent's age was included as a covariate as past research has found that young parents are more likely to be identified for maltreatment than parents who are relatively older. Specifically, Sidebotham et al. (2001) found that for both mothers and fathers,

becoming a parent at age 20 or younger was a significant predictor for identification for child abuse. Similarly, Brown et al. (1998) found an over three-fold increase in likelihood for child maltreatment identification for children born to mothers under 18-years of age.

Finally, the number of children in the home was included as a covariate as family size is among one of the most robust predictors of identification for child maltreatment in the literature (Chaffin, Kelleher, and Hollenberg, 1996; Wu, Ma, Carter, Ariet, Feaver, Resnick, and Roth, 2004; Bae, Solomon and Gelles, 2009; Proctor et al., 2012).

1.7 The Current Study

The key question for the current study is whether the four factors described above can help predict which parents will be identified by CPS for recurrence of child maltreatment during the 18-month study period between the post-treatment data collection time point and the final data collection time point. The study will examine both the unique and combined predictive influences of these potential risk factors in a sample of parents with open CPS cases and concurrent substance abuse concerns.

The current study addresses methodological limitations in previous research and focuses on a specific subset of families in the child welfare system. Specifically, past research on the relationship between parental substance abuse and child maltreatment recurrence has relied on data from national databases such the NCANDS and NSCAW surveys. While these resources allow for analysis of large, representative samples of families, they tend to lack nuance in their measurement. For example, such studies have often dichotomized a parent's substance use as "present" or "absent" based on parent report or caseworkers' perceptions rather than more comprehensive evaluations using

psychometrically sound measures, (Kepple, 2015; Berger, Slack, Waldfogel & Bruch, 2010; Casanueva, 2015; DePanfilis & Zuravin, 1999; Staton-Tindall, Sprang, Clark, Walker, & Craig, 2013). There are important discrepancies in the effect of substance use that is simply recreational or occasional compared to disordered use. Specifically, Kepple (2015) found that parents who met criteria for the DSM-5 diagnosis of substance abuse disorder were significantly more likely to engage in physical abuse and neglect compared to those whose substance use was classified as “problematic” but did not reach the level of a disorder or those whose use was classified as “non-problematic.” The current study addresses this limitation by utilizing the gold-standard measure of substance-use severity which measures use on a continuum.

Similarly, when it comes to assessing social support, the large representative surveys have often coded this variable post hoc by means of researcher review of case reports or by interviewing caseworkers regarding their interpretations of family functioning, rather than by asking the parents to report on these factors directly (Casanueva, 2015; DePanfilis & Zuravin, 2002; DePanfilis & Zuravin, 1999; Dorsey, Mustillo, Farmer, & Elbogen, 2008). The current study measures parents’ level of social support, parenting beliefs and quality of life through use of validated self-report instruments.

The study’s hypotheses are as follows:

Hypothesis 1: Parents who reported more severe substance abuse will be more likely to have been identified for recurrence of child maltreatment at 18-month follow-up.

Hypothesis 2: Parents with more social conflict will be more likely to have been identified for recurrence of child maltreatment at 18-month follow-up.

Hypothesis 3: Parents who endorse higher acceptance of harsh parenting practices will be more likely to have been identified for recurrence of child maltreatment at 18-month follow-up.

Hypothesis 4: Parents who endorse lower overall quality of life will be more likely to have been identified for recurrence of child maltreatment at 18-month follow-up.

Hypothesis 5: Significant interactions will be found among the potential predictors such that their combined effects predict recurrence of child maltreatment at 18-months follow-up, above and beyond the individual contributions of each predictor alone.

CHAPTER 2. METHOD

2.1 Study Design

Using a prospective design, this study assessed the relationship between four variables (parental substance abuse, parental social conflict, parental belief in harsh parenting practices and parental quality of life), and recurrence of child maltreatment. Data was collected as part of a larger, NIDA-funded treatment study of substance abusing parents with co-occurring CPS involvement. Parents of young children (ages two to eight years) were eligible to participate if they had an open child maltreatment case and were seeking intensive outpatient substance-abuse services, either voluntarily or due to court order. For families that had more than one child between the ages of two and eight, the child with the closest upcoming birthday was chosen to be the subject of data collection. All parents received standard services from the substance abuse treatment center and were randomized to one of four additional treatment conditions: 1) Enhanced treatment as usual consisting of biweekly personal-goal management (PGM) with a social worker; 2) PGM and Level-5 Advanced Triple P Positive Parenting Program (Pathways Triple P), an intensive evidence-based parent training program for families at high risk for child maltreatment; 3) PGM with Contingency Management, an evidence-based program that provides participants with the opportunity to draw increasing numbers of vouchers for tangible rewards as they maintain longer periods of sobriety; and 4) PGM, Pathways Triple P and Contingency Management combined. All additional treatment modalities beyond treatment as usual were delivered by study staff unaffiliated with the substance

abuse treatment center.

Regardless of treatment condition or adherence to treatment components, all participants who provided data at the post-treatment time point were included in the current analysis. Data on the predictors of interest collected at the post-treatment time point were treated as the baseline data for the current study, limiting the potential role of treatment effects. Eighteen months was chosen as the follow-up period because recidivism rates for child maltreatment have been shown to be the highest in the first six months after initial identification with most recurrence occurring within one year, and rates falling precipitously after two years (Connell, Bergeron, Katz, Saunders, & Tebes, 2007; Hindley, Ramchandani & Jones, 2006; Solomon et al., 2012).

2.2 Subject Selection

Parents were enrolled from two substance abuse treatment centers in adjacent counties. Enrollment criteria included that: 1) the parent was involved with CPS for a substantiated case of child maltreatment including physical abuse and/or neglect of a child between the ages of two and eight years old; 2) the parent was the primary or significant caregiver of the child with hopes of maintaining or regaining custody; 3) the parent was currently or had recently engaged in the use of illegal substances or alcohol or was a poly-substance abuser, with use significant enough to warrant intensive outpatient treatment; and 4) the parent was English-speaking.

Parents identified as having engaged in sexual abuse or who reported having serious uncontrolled psychiatric illnesses including schizophrenia or acute psychosis were not eligible to participate. Those in need of intensive drug detoxification services were eligible for enrollment once detoxification had been completed and participation in

intensive outpatient substance-abuse treatment services had begun. The sample size used for the current study was 117 parents from unique households.

2.3 Measurement

Study procedures were approved by the home university's Institutional Review Board (IRB). At time of enrollment, informed consent was obtained from each participant by study staff unaffiliated with the substance abuse treatment center. Participants were informed that their participation was voluntary, could be stopped at any time, and would not affect their standing at the treatment center or in any pending legal proceedings or case dispositions. Participants were informed of the risks associated with participating and were assured that the data they provided would not be shared with CPS, law enforcement or any parties involved in their case or treatment. They were informed that all study data would be kept confidential except in the case of threat of harm to human life.

All predictor and demographic data were collected via Qualtrics survey software, version 2002. The survey was administered electronically on a tablet to participants who were aided in responding by study personnel. Baseline data collection occurred at the substance abuse treatment center at the time of the enrollment in the study. At subsequent time points, data collection occurred most frequently at the treatment center, though at times was conducted at participant's homes, or locations in the community such as the local library in order to accommodate participant need and maximize study retention.

Participants were compensated at an increasing rate for providing data at each subsequent data collection time point. For the post-treatment time point used in the current analyses, participants were provided with a \$40 gift card. Participants were not

compensated for their participation in any treatment aspects of the study. Table 2.1. provides a summary of the instruments used and the timing of their administration.

2.3.1 Substance abuse.

Substance use severity was assessed via self-report on the ASI-Lite, *Drug and Alcohol Composite subscale* administered as part of the interview conducted at the post-treatment time point. Among the 19 items that made up this composite, respondents were asked to disclose the number of days they had used any of a list of 10 substances or multiple substances over the past 30 days and how many days they experienced alcohol or drug problems out of the past 30 days. They were also asked to rate how bothered they had been by their substance use, and how important it was for them to seek treatment for their substance abuse on a scale from “0- Not at all” to “4- Extremely.” Summary scores for the subscale are computed using weighted averages so that each score falls in a range from 0 to 1 with higher scores indicating higher levels of substance abuse severity. The measure did not differentiate between use of alcohol and illegal substances and encompassed all types of substance use, including marijuana, cocaine, heroin, methamphetamine, inhalants, abuse of prescription pills and a category for “other.”

The ASI-lite was derived from and has been found to be psychometrically equivalent to the original full-length Addiction Severity Index (Cacciola, Alterman, McLellan, Lin, & Lynch, 2007), which is the most commonly used clinical assessment of substance abuse pathology and has established itself as the gold standard for research on alcohol and drug addiction over the past 20 years (Leonhard, Mulvey, Gastfriend & Shwartz, 2000). Interclass correlations (ICCs) for the alcohol and drug use subscale comparing the ASI-lite to the original measure have shown high reliability, ranging from

.76 to .89 (Cacciola et al. 2007; Mäkelä, 2004). Internal consistency of the items on the alcohol and drug composite subscale has been found to be moderate, reaching alpha coefficients of .62 to .69 (Cacciola, Alterman, McLellan, Lin, & Lynch, 2007; Leonhard et al., 2000; Snow & Tipton, 2009). Tests of concurrent validity with other measures of alcohol and drug use have shown correlations ranging from .50 to .73.

2.3.2 *Social conflict.*

The *Family and Social Relationships subscale* of the ASI-Lite was used to assess each parent's level of social conflict. Questions from this subscale asked respondents to indicate how many days they had had trouble getting along with significant family members, friends and acquaintances over the past 30 days, how much their interpersonal conflicts had bothered them and how important it was for them to get help with their interpersonal conflicts, again on a scale of "0- Not at all" to "4- Extremely." As above, scores calculated using a weighted average and were computed to range from 0 to 1 with higher scores indicating higher levels of interpersonal conflict. Inter-rater reliability ranged from .84 to .94 while interclass correlations were less robust, only reaching .22.

2.3.3 *Belief in harsh parenting practices*

The Power Assertion/Punitive Discipline scale of the Dimensions of Discipline Inventory (DDI) was administered to capture each parent's belief in the acceptability of harsh discipline practices. The 13 items that made up this scale were derived from existing established psychometrically sound instruments such as the Parenting Scale (Arnold, O'Leary, Wolff, & Acker, 1993) and the Alabama Parenting Questionnaire (Shelton, Frick, & Woollon, 1996), providing face validity, though no data on the specific validity of the DDI were found. Parents were asked to rate on a scale of "1 – Never

Okay” to “4- Always Okay,” how appropriate various potential parenting behaviors are to use with a child the age of their child targeted in this study. For example, item five asks “How Okay or Not Okay is it to... grab or shake a child that age to get their attention?” Parents’ answers to each of the 13 items was then averaged for an overall score with a range of 1 to 4 with higher scores indicating more acceptance of punitive discipline strategies. The reliability of the 13 items that comprised this subscale were found to have a Cronbach’s alpha of .64 in an initial study, with more recent analyses finding alphas of .81 and .82 (Straus & Fauchier, 2011). In the current study, internal consistency was found to be .63.

2.3.4 Quality of life.

To capture parents’ self-reported quality of life, the Quality of Life Inventory (QOLI) was used. The QOLI is a 17-item, single-construct measure of overall well-being spanning physical health, occupational, social and environmental satisfaction. Respondents are provided with 17 constructs such as “Health” “Relationships” “Work” and a definition of the construct such as “Health is being physically fit, not sick and without pain or disability.” Participants are first asked to rank how satisfied they are in that area of their life from “-3 – Very Dissatisfied” to “3 – Very Satisfied.” Participants are then asked to rate how important this area is to their overall well-being from “0 – Not at all Important” to “2- Extremely Important” An overall QoL summary score is calculated by multiplying the satisfaction score by the importance score for each domain and averaging across all areas with non-zero importance domain scores. Summary scores ranged from -6 to 6 with higher ratings indicating higher overall quality of life. In a non-clinical sample, the average score found for adults was approximately 2.75 to 3.0. The

QOLI has shown internal consistency ranging from .77 to .89, test-retest reliability of .80, treatment sensitivity and utility with culturally diverse populations (Frisch, Cornell, Villanueva, & Retzlaff, 1992). In the current study sample, internal consistency for the QOLI was found to be .86.

2.3.5 Maltreatment recurrence.

Based on a review of records obtained directly from the Department of Social Services (DSS), outcomes for each family were dichotomized as either having had one or more new incidents of child maltreatment in the 18-month follow-up period or having no new incidents during that time frame. DSS records were reviewed by the author (EN) and by the project administrator (DW). Cases were coded as having recurrence only if the new reports were investigated by DSS and determined to be “Founded.” According to DSS, the term “Founded” indicates that there is “a preponderance of evidence that abuse or neglect is more likely than not to have occurred, evidence which, when fairly considered, is more convincing as to its truth than the evidence in opposition” (Leeb, Paulozzi, Melanson, Simon, & Arias, 2008).

In some cases, reports were made regarding a suspected new incident of maltreatment, but insufficient evidence was found. In such cases, the report was determined to be “Unfounded.” Unfounded cases are further classified by number. “Unfounded Category 1” indicates that an investigation took place, but no evidence of maltreatment was found. “Unfounded Category 2” indicates that some but not sufficient evidence was found. “Unfounded Category 3” indicates the case was not investigated because the family could not be found. “Unfounded Category 4” indicates that DSS chose not to investigate the case for undisclosed reasons. For the purposes of the current analyses, “Unfounded” cases were *not* counted as maltreatment recurrence.

Categories of maltreatment vary across state and local jurisdictions and do not conform to a uniform set of definitions. However, the Centers for Disease Control and Prevention (CDC) has issued guidelines on definitions intended to increase consistency across jurisdictions (Leeb et al., 2008). For the current study, the following categories of maltreatment as defined by the CDC were used: 1) “Other Neglect,” including acts of omission such as failure to provide reasonably adequate care for children and/or failure to supervise children appropriately; 2) “Threat of Physical Harm,” when a parent or caregiver expresses intent or gives signs or warnings through words, gestures, or weapons to communicate the likelihood of inflicting harm to the child; 3) “Physical Environment Inadequate,” when a caregiver fails to provide adequate nutrition, hygiene, shelter, or clean, fitting and weather-appropriate clothing for the child; and 4) “Physical Abuse,” such as the use of physical force against a child that results or has the potential to result in injury, regardless of whether it has left a mark or resulted in permanent disability, disfigurement, or death. A fifth category, labeled “Other,” was also included to capture additional findings not covered by the preceding definitions, such as fetal abuse and educational and medical neglect (Leeb et al., 2008).

2.4 Analyses

Analyses were conducted using IBM SPSS Statistics 24. Demographic data on parents’ race and ethnicity, educational attainment, family income, parent’s age and number of children in the home is provided below (see Table 3.1). Bivariate correlations between all predictors and covariates were calculated (see Table 3.4) and descriptive data on each of the predictors for the overall sample and by each outcome are presented in Table. 3.5.

Logistic regression was chosen because it allows for prediction of a dichotomous outcome based on multiple scaled and categorical variables. Recurrence of child maltreatment was the modeled outcome (coded 1) while no recurrence was the reference outcome (coded 0). To assess the predictive value of each of the four variables of interest, four binary logistic regression analyses were performed. A fifth logistic regression was performed to analyze the combined effects of all covariates of interest including number of children in the home, parents' race, parents' level of education, and family monthly income. These covariates were entered in a single step as their combined effect is more pertinent than their individual contributions. A sixth logistic regression

Table 2.1

Measures and Timing of Data Collection.

<u>Construct</u>	Immediately post-treatment <u>Measure</u>	18-month follow-up
Substance-use severity	ASI-Lite Drug and Alcohol Composite scale	
Social conflict	ASI-Lite Family and Social Functioning scale	
Parenting beliefs	Dimensions of Discipline Inventory	
Quality of life	Quality of Life Inventory	
Recurrence of maltreatment		DSS record search

assessed the overall model of all potential predictors and covariates together. Each of the predictor variables of interest was centered prior to running analyses to ease interpretation of results.

Results of each regression analysis are described separately below. Each analysis reveals how much variance in the outcome is explained by the predictor of interest, the direction of the predicted change in outcome and the magnitude of the expected change in outcome in the form of an odds ratio. Data on the sensitivity and specificity of each model are also presented to determine if the predictor improved our ability to accurately predict which families would be identified for recurrence greater than chance. Secondary analyses examined the nature of the interaction of significant predictors by plotting the predicted probability of maltreatment recurrence when the other factors were held constant.

CHAPTER 3. RESULTS

3.1 Demographic Data

The 117 cases included 115 mothers and two fathers. The sample was diverse with respect to race and ethnicity with 42.7% of participants identifying as White, 47.9% identifying as Black, 5.1% identifying as Hispanic, 1.7% identifying as Asian, Native American or Pacific Islander and 2.6% identifying as Other. Family income was highly skewed towards poverty with the largest category of participants making less than \$250 a month and a large majority making less than \$1,000 a month. Parents' level of education was also quite low, with the largest number of parents having less than a high school degree (37.6%) and the next largest having a high school degree or GED (34.2%). Only 5.2% of the sample had a 4-year college degree or higher. Most families had either two or three children in the home (34.2% and 31.6%, respectively), with 16.2% reporting only one child and 18.0% reporting four or more children (See Table 3.1).

3.2 Original CPS Incident Findings

DSS records for each case were reviewed and the types of maltreatment findings were recorded. Each founded case qualified for at least one category of maltreatment, and many cases qualified for more than one. When more than one category was found all were reported. Across the sample, the most common type of maltreatment was Other Neglect followed by Threat of Physical Harm, Physical Environment Inadequate, Physical Abuse and "Other" (see Table 3.2).

Table 3.1

Demographic data for study sample (N= 117 families)

Demographic variables	N	%
Parent Level of Education		
< High School	44	37.6
High School/ GED	40	34.2
1-2 Year College Degree	27	23.1
4-Year College Degree	5	4.3
Any graduate work	1	.9
Family Monthly Income		
<\$250	38	33.3
\$250-\$499	17	14.5
\$500-\$999	25	21.4
\$1,000-\$1,499	19	16.2
\$1,500-\$1,999	6	5.1
\$2,000+	11	9.4
Parent Race/ Ethnicity		
Non-Hispanic white	50	42.7
African American/ Black	56	47.9
Hispanic	6	5.1
Asian, Native American or Pacific Islander	2	1.7
Other	3	2.6
Number of children in the home		
1	19	16.2
2	40	34.2
3	37	31.6
4	12	10.3
>/=5	9	7.7
	M	Range
Parent age at enrollment	29.89	18 - 48

Table 3.2.

Original CPS incident finding categories (N= 117 families)

CPS Category	N	%
Physical Abuse	6	3%
Physical Environment Inadequate	28	16%
Other Neglect	98	56%
Threat of physical harm	29	17%
Other (fetal abuse, educational neglect, contributing to delinquency of minor etc...)	14	8%

3.3 Outcome Coding

Review of the DSS records revealed new reports of maltreatment for 37 of the 117 cases (30.8%). Of those new reports, 28 (23.9%) were investigated and sufficient evidence was found to conclude that maltreatment had re-occurred. One report was investigated but maltreatment was ruled out (i.e., Unfounded Category 1.) Six cases were investigated and some, but not enough, evidence was found to conclude maltreatment had occurred, (i.e., Unfounded Category 2) and two cases were not investigated because the family could not be found (i.e., Unfounded Category 3.)

As with the original findings, the most common type of recurrent maltreatment was Other Neglect (24 of the 28 recurrent cases), followed by Threat of Physical Harm (9 of the 28 recurrent cases) (see Table 3.3). Reliability of data coding across the DSS records was calculated at 98%.

Table 3.3.

Recurrent CPS Incident Findings (N= 28 families)

CPS Category	N	%
Physical Environment Inadequate	1	3%
Other Neglect	24	83%
Other threat of physical harm	9	32%
Other (non-attendance, educational neglect, contributing to delinquency of minor etc...)	3	10%

3.4 Correlations Among Predictors

Bivariate correlation analyses revealed five statistically significant correlations (see Table 3.4). Severity of substance use was positively associated with social conflict ($r=.232, p=.012$) and level of educational attainment was positively associated with belief in harsh parenting practices ($r=.232, p=.012$). Parent age was positively associated with substance abuse severity ($r=.185, p=.045$), quality of life ($r=.221, p=.017$) and being of minority race ($r=.232, p=.012$).

3.5 Predictor Variables by Outcome

Descriptive data (range, mean and standard deviation) for each of the four predictors of interest are presented below for the overall sample, as well as by outcome. The range found for substance abuse severity was notably low, reaching a max score of only .29 on a scale ranging from 0 to 1. The range observed for belief in the use of harsh parenting practices was also skewed low, with a max score of 2.39 on a 1 to 4-point scale.

Table 3.4.

Bivariate Correlations Among the Predictors and Covariates (N=117)

	1	2	3	4	5	6	7	8
1. Substance use								
2. Social conflict	.232*							
3. Belief in harsh parenting	.005	.049						
4. Quality of life	.055	-.136	-.130					
5. Num. children in home	-.037	-.041	.129	.060				
6. Minority status	-.014	-.047	-.030	.032	.104			
7. Parent education	.047	.178	.232*	-.172	-.050	-.067		
8. Monthly income	.032	-.035	.060	.135	.116	-.171	-.035	
9. Parent age	.185*	-.152	.047	.221*	.085	.232*	-.062	.145

*significant at $p < .05$ level.

3.6 Binary Logistic Regression Results

3.6.1 Assumptions of binary logistic regression.

The first assumption of binary logistic regression is that the dependent variable is measured on a dichotomous scale. This assumption was met as the outcome data was coded as presence (1) or absence (0) of maltreatment recurrence. The second assumption is that the independent variables are either measured on a continuous scale or are categorical. All four potential predictors of interest as well as the covariates satisfied this assumption.

The third assumption is that the outcome variable has mutually exclusive and exhaustive categories and that each observation is independent from the other. This assumption was satisfied as each family was counted only once and the outcome for each family was not dependent on that of any other.

The fourth assumption of binomial logistic regression is that a linear relationship exists between the logit transformation of each of the continuous independent variables

Table 3.5.

Descriptive Statistics for Predictor Variables for Overall Sample and by Outcome

	Observed range	Scale	Overall (N=117)		No recurrent maltreatment (N=89)		Recurrent maltreatment (N=28)	
			M	SD	M	SD	M	SD
Substance use severity	.00-.29	0-1	.06	.06	.06	.06	.07	.06
Social conflict	.00-.89	0-1	.233	.154	.233	.145	.235	1.83
Belief in harsh parenting	1.08-2.39	1-4	1.70	.241	1.67	.25	1.78	.21
Quality of life	-2.06-5.75	-6-6	2.21	1.62	2.23	1.58	2.13	1.79

and the dependent variable. The Box-Tidwell procedure (Box & Tidwell, 1962) was used to assess this assumption and linear relationships were found for the natural log of each of the four potential predictor variables and the outcome variable.

The fifth assumption of binary logistic regression is non-multicollinearity of predictors, meaning that the independent variables are not highly correlated with each other. While significant correlations were found between substance use severity and social conflict ($p=.012$) and parents' education and belief in harsh parenting ($p=.012$), neither of these correlations was large enough to violate the tolerance window or analysis of Variance Inflation Factor (VIF), thus the assumption of non-multicollinearity was met.

3.6.2 Probability of recurrence without predictors in model.

Given that most cases (89 of 117) were not identified for recurrence, the basic model predicted non-recurrence for each case in the sample and correctly classified

76.1% of cases, 100% of those that did not recur (specificity) and 0% of those that did (sensitivity). The purpose of the following analyses was to determine if adding the factors and covariates of interest could help to improve the sensitivity and overall predictive power of the model. Statistical significance was set at .05 based on the accepted standard in the field. The effect sizes and percentages of variance accounted for by each model are also presented.

3.6.3 Substance abuse severity.

The logistic regression looking at substance abuse severity found that this variable did not significantly contribute to our ability to differentiate the outcome, $\chi^2(1, n=117) = .637, p=.425$. As expected, more severe substance use was associated with greater likelihood of child maltreatment recurrence, but with a very small effect size. For each standard deviation increase in substance abuse severity, there was an associated 1.18 factor increase in the odds of recurrence (95% CI = .77, 1.86). Severity of substance abuse accounted for between .5% (Cox & Snell R square) and .8% (Nagelkerke R Squared) in the variance between those who were identified for recurrence of child maltreatment and those who were not. Including substance abuse severity scores did not change the sensitivity, specificity or overall predictive power of the model from correctly predicting 76.1% of cases.

3.6.4 Parents' social conflict.

Results of the logistic regression assessing the contribution of parents' social conflict were also non-significant, $\chi^2(1, n=117) = .003, p=.957$. Social conflict had a negligible association with child maltreatment recurrence as each standard deviation increase in social conflict was associated with only a 1.01 factor increased in the odds for

recurrence (95% CI = .66, 1.55). Social conflict accounted for none of the variance between those who were identified for recurrence and those who were not, and including social conflict scores did not change the sensitivity, specificity or predictive power of the model from the base model.

3.6.5 Belief in harsh parenting practices.

Results of the logistic regression assessing the contribution of belief in harsh parenting practices were significant $\chi^2(1, n=117) = 3.78, p=.046$. Greater belief in harsh parenting practices predicted child maltreatment recurrence in the expected direction with each standard deviation increase in belief in harsh parenting practices associated with an increase of 1.54 in the odds of recurrence (95% CI = 1.0, 2.43). Increased belief in harsh parenting accounted for between 3.3% (Cox & Snell R square) and 5% (Nagelkerke R Squared) of the variance between those who were identified for recurrence of child maltreatment and those who were not. Including harsh parenting beliefs in the model reduced the predictive utility of the classification table from correctly predicting 76.1% of the cases to predicting 74.4% of cases correctly. The model incorrectly predicted recurrence for two cases when recurrence was not found, reducing specificity to 97.8%. The model did not predict any cases would recur, thus sensitivity did not change.

3.6.6 Quality of life.

Results of the logistic regression assessing the contribution of quality of life were not significant $\chi^2(1, n=117) = .083, p=.774$. Quality of life scores had a minimal effect in predicting child maltreatment recurrence with each standard deviation increase in quality of life associated with a decrease in the odds of recurrence by a factor of 1.06 (95% CI = .61, 1.44). Increased quality of life accounted for approximately .1% (Cox & Snell R

square and Nagelkerke R Squared) of the variance between those who were identified for recurrence and those who were not. Including quality of life scores in the model did not change the specificity, sensitivity or predictive power of the model from correctly predicting 76.1% of the cases.

3.6.7 Covariates.

Results of the logistic regression assessing the contributions of the covariates (parent's race, parent's income, parent's education, parent's age and number of children in the home) were non-significant overall, $\chi^2(1, n=117) = 7.01, p=.220$, accounting for between 5.8% (Cox & Snell R square) and 8.7% (Nagelkerke R Squared) of the variance between those who were re-identified for maltreatment and those who were not. Number of children in the home was the most robust and only significant predictor, $\chi^2(1, n=117) = 4.00, p=.045$. Each additional child in the home was found to increase the odds for maltreatment recurrence by a factor of 1.50 (95% CI = 1.0, 2.08). Inclusion of the all covariates improved the sensitivity of the model from 0% to 3.6%, correctly predicting one out of the 28 cases with recurrence, and decreased the specificity to 98.9%, incorrectly predicting one case would have recurrence when it did not. The overall predictive validity remained the same at correctly classifying 76.1% of cases.

3.6.8 Overall model.

Results of the logistic regression assessing the contribution of the overall model with all predictors and covariates entered together was not statistically significant, $\chi^2(1, n=117)=11.98, p=.214$. Together, the model accounted for between 9.7% (Cox & Snell R square) and 14.6% (Nagelkerke R Squared) of the variance between those who were identified for recurrence of child maltreatment and those who were not. The sensitivity of

the model improved from 0% to 14.3% by correctly predicting four out of the 28 cases with recurrence but the specificity of the model decreased from 100% to 97.8% by predicting that two cases would have recurrence when they did not. The overall predictive power of the model improved slightly from correctly predicting 76.1% of cases to 77.8% of cases.

3.6.9 Interaction effects.

Two logistic regressions assessing potential interaction effects were conducted. Based on literature suggesting a potential augmenting effect between substance abuse severity and belief in harsh parenting practices, the combined effects of these variables was assessed. Results revealed a non-significant finding, $\chi^2(1, n=117)=5.57, p=.590$. A second logistic regression was e conducted to assess the interaction between the two significant predictors: belief in harsh parenting practices and number of children in the home. Results of this analysis indicated a significant interaction effect, $\chi^2(1, n=117)=5.74, p=.018$ wherein belief in harsh parenting practices had a smaller effect on the probability of recurrence in families with fewer children than in families with more children (see Figure 3.1).

3.7 Exploratory Analyses: Including “Unfounded” cases.

Despite efforts by DSS agencies to systematically classify investigated reports of maltreatment as “Founded” vs. “Unfounded,” research has demonstrated that children ultimately do not differ in the amount of harm they incur based on the case’s finding (Casenueva, 2015; Drake et al., 2003). To investigate the role of the four predictors of interest further, exploratory analyses were conducted in which the logistic regression

analyses above were repeated, this time expanding the definition of recurrence to include the six cases classified as “Unfounded category 2” and two cases classified as

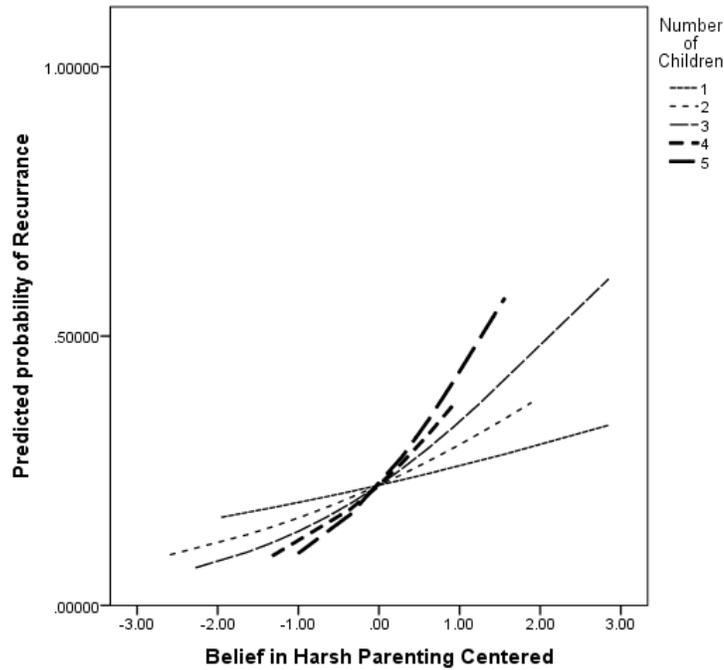


Figure 3.1

Interaction of belief in harsh parenting practices and number of children in the home

“Unfounded category 3.” As discussed above, cases are categorized as Unfounded category 2 when there is some – but not sufficient – evidence found to conclude that maltreatment occurred. Cases are categorized as Unfounded category 3 when an investigation is not able to be completed because the child or family was not locatable. The one case that was determined to be “Unfounded category 1” was not included as

“recurrence” in these exploratory analyses as this finding indicates that the evidence was sufficient to determine the maltreatment had *not* occurred.

With the eight additional “Unfounded” cases included, the basic model again assumed that given equal probability of recurrence for each case, there remained a greater likelihood that recurrence would not occur than would occur (82 out of the 117 cases had no recurrence). The classification table therefore predicted non-recurrence for each case, for an overall correct classification rate of 70.1%.

3.7.1 Substance abuse severity.

Results of the repeated logistic regression assessing the contribution of substance abuse severity with the eight additional cases included once again showed that substance abuse did not improve our ability to predict recurrence at a statistically significant level, $\chi^2(1, n=117) = 1.126, p=.289$. As above, increased substance abuse severity predicted child maltreatment recurrence in the expected direction, but the effect size remained very small. Each standard deviation increase in substance abuse severity was associated with a 1.24-fold increase in the odds of recurrence. The amount of variance accounted for doubled, with substance abuse severity accounting for between 1% (Cox & Snell R square) and 1.4% (Nagelkerke R Squared) of the variance between those identified for recurrence and those who were not. Including substance abuse severity in the model incorrectly predicted that one case would result in recurrence when it did not, decreasing the specificity from 100% to 98.8%. The sensitivity of the model did not change, thus the overall predictive power decreased from 70.1% to 69.2%.

3.7.2 Parents' social conflict.

Results of the logistic regression assessing parents' levels of social conflict with the inclusion of the eight unfounded cases were not significant, $\chi^2(1, n=117) = .072$, $p = .789$. This time, social conflict predicted child maltreatment recurrence in the opposite direction than what was expected, with each standard unit increase in social conflict associated with a decrease in the odds of recurrence by a factor of 1.10. However, this effect size is negligible and increased social conflict accounted for less than 1% of the variance between those who were identified for recurrence and those who were not. Including social conflict in the model did not change the specificity, sensitivity or predictive power of the model from correctly predicting 70.1% of the cases.

3.7.3 Belief in harsh parenting practices.

Results of the logistic regression assessing the contribution of belief in harsh parenting practices remained significant with the addition of the unfounded cases, $\chi^2(1, n=117) = 5.83$, $p = .016$. Specifically, results indicated that increased belief in harsh parenting practices predicted child maltreatment recurrence in the expected direction with each standard unit increase in belief in harsh parenting practices associated with an increase in odds of recurrence by a factor of 1.66. Increased belief in harsh parenting practices accounted for between 4.9% (Cox & Snell R square) and 6.9% (Nagelkerke R Squared) of the variance between those who were identified for recurrence of child maltreatment and those who were not. Including belief in harsh parenting practices in the model with the unfounded cases did not change the overall the predictive utility from correctly predicting 70.1% of the cases. The sensitivity of the model improved from 0% to 5.7% by correctly predicting two cases that had recurrence, while the specificity

decreased from 100% to 97.6% by predicting two cases would have recurrence when they did not.

3.7.5 Quality of life.

Results of the logistic regression assessing the contribution of parents' self-reported quality of life with the inclusion of the unfounded cases was, once again, not significant, $\chi^2(1, n=117) = .179, p=.672$. While the effect size was minimal, results indicated that increased quality of life predicted child maltreatment recurrence in the opposite of the expected direction with each standard unit increase in quality of life associated with an increase in the odds of recurrence by a factor of 1.09. Quality of life accounted for a negligible .2% (Cox & Snell R square and Nagelkerke R Squared) of the variance between those who were identified for recurrence of child maltreatment and those who were not. Including quality of life in the model did not change the sensitivity, specificity or predictive power of the model from correctly predicting 70.1% of the cases.

3.7.6 Covariates.

Results of the logistic regression assessing the contribution of the five covariates with the unfounded cases included was again non-significant, $\chi^2(1, n=117) = 7.81, p=.167$, accounting for between 6.5% (Cox & Snell R square) and 9.2% (Nagelkerke R Squared) of the variance. As above, the largest contribution to the model was the number of children in the home. Each additional child in the home resulted in increased odds for maltreatment recurrence by a factor of 1.58 (95% CI = 1.07, 2.25). Adding the covariates improved the sensitivity of the model from 0% to 5.7% (correctly predicting two out of the 35 cases with new incidents) but reduced the specificity of the model from 100% to

97.6% by predicting two cases would have new incidents when they did not. Overall, the model correctly predicted 70.1% of cases.

3.7.7 Overall model.

Results of the logistic regression assessing the overall model with all predictors and all covariates entered together with the inclusion of the unfounded cases was not statistically significant ($\chi^2(1, n=117) = 16.34, p=.060$). The overall model accounted for between 13.0% (Cox & Snell R square) and 18.5% (Nagelkerke R Squared) of the variance between those who were identified for recurrence and those who were not. The overall model improved the sensitivity from 0% to 28.6% (correctly predicting 10 out of the 35 cases with new incidents) but reduced the specificity from 100% to 93.9% by predicting that five cases would have recurrence when they did not. Overall, the model correctly predicted 74.4% of cases, a small improvement over the 70.1% of cases correctly predicted by the base model.

3.8 Exploratory Analysis: Child Out of Home Placement

Another factor worthy of exploration is where the children were placed after the maltreatment incident that preceded the family's enrollment in this study. The current study included families regardless of whether their children had been removed from their home and placed in relative or foster care or remained with their caregiver following the maltreatment investigation. This factor complicates interpretation of results as parents whose children were removed for any period of time during the 18-month follow-up period had less contact with them and thus less opportunity for maltreatment recurrence than families whose children were not removed. The decision to include families whose children were removed was made as many past studies only included families whose

children remained in the home. This research captured only a subset of the population involved with child protective services and missed out on further understanding of what are likely the highest-risk cases (Dorsey et al., 2018). Furthermore, research has found that parents whose children were removed from their care temporarily have higher rates of re-maltreatment when their children are returned than those whose children remained in their home throughout (Solomon et. al., 2012). The question as to whether to include cases where children have been removed is thus a double-edged sword. Including them complicates comparison across families who have differential access to their children, but leaving such families out excludes those who could most benefit from increased knowledge on how best to prevent future recurrence.

It was beyond the scope of this study to capture the exact amount of time each child was in or out of their home over the course of the 18-month study period. However, information on each child's placement at the post-treatment time point was collected for all participants and data on child placement at the end of the 18-month follow-up period was available for most cases.

For each case, child placement status was classified in one of three categories: Code 0 -- the referent child was in the home at both the post-treatment and the 18-month follow-up study time point; Code 1 -- the referent child was in the home at one of the two data collection time-points and out of the home at the other or Code 2 -- the referent child was out of the home at both time-points. Data on both time points was available for 75 out of the 117 families (64%). The initial descriptive analysis revealed that 54 out of the 75 families retained their children in their home at both the post-treatment and 18-month

time points. For 13 families, the child was in the home for one but not the other time point and for 8 families, the child was out of the home at both time points.

To assess if a significant relationship existed between the child's placement and recurrence of child maltreatment, a Chi-square analysis was used. Chi-square was chosen as the data consisted of only categorical variables. Results of the analysis revealed a pattern suggesting that child placement was not associated with maltreatment, $\chi^2(2, n=75) = 2.19, p=.334$. Of the 75 cases included in this analysis, 21 were identified for recurrent maltreatment (28%). Of the 54 cases where the child was in the home at both data collection points, 14 were identified for maltreatment recurrence, a 26% recurrence rate. Of the 13 families whose child was present at one but not both time points, three were identified for recurrent maltreatment, a 23% recurrence rate. Of the eight families whose child was not in the home at either time point, four were identified for re-maltreatment, a 50% recurrence rate. Of the 54 cases without maltreatment recurrence, 40 (74%) had the referent child in the home at both time points, 10 (19%) had the child in the home at one but not both time points and four (7%) had the child out of the home at both time points. Of these 21 cases, 14 were families whose child was in the home at both time points (67%), three were families whose child was in the home at one but not both time points (14%) and four did not have the child in the home at either time point (19%) (see Figure 3.2).

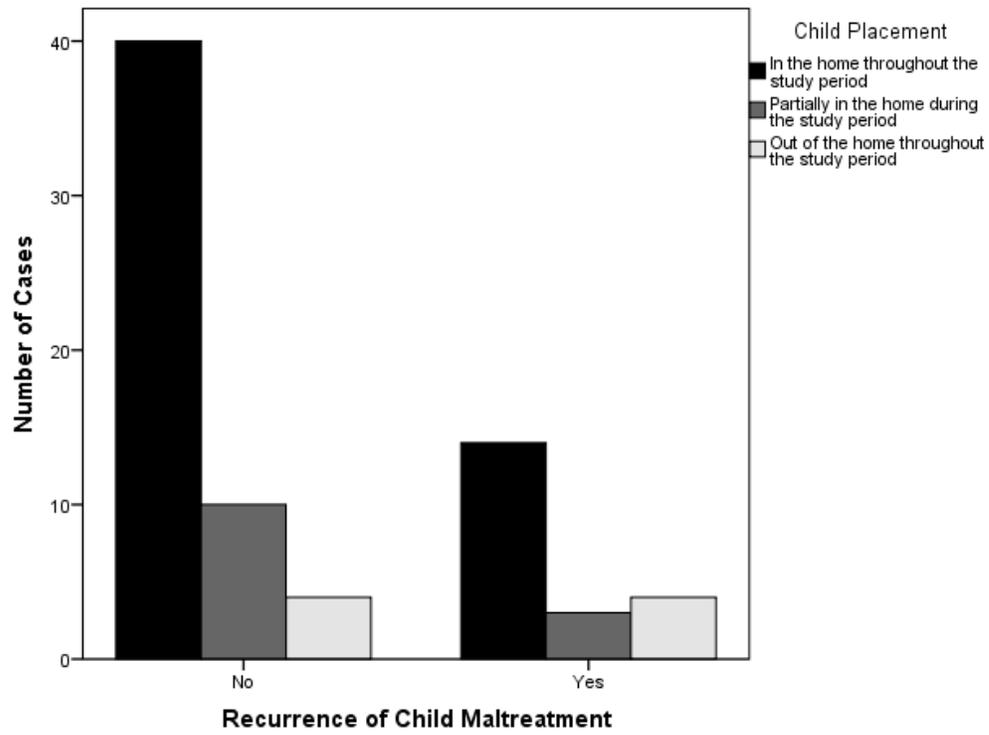


Figure 3.2

Child out of home placement by outcome.

CHAPTER 4. DISCUSSION

This study sought to determine if recurrence of child maltreatment could be predicted by four factors of interest: Parental substance use, parental social conflict, parental belief in harsh parenting practices and parental quality of life. The sample consisted of 117 parents who had an open CPS case and co-occurring substance use, and at least one child between the ages of two and eight years. The overall rate of maltreatment recurrence for the sample was 23.9% within 18 months, consistent with the national rate of approximately 25%.

Results of the logistic regression analysis assessing all predictors of interest and covariates revealed that these factors accounted for between 7.9% and 11.9% of the total variance discriminating recurrence and non-recurrence cases. The overall model improved the sensitivity from 0% to 10.7%, correctly identifying 3 of the 28 cases where there was recurrence. However, it did not change the overall predictive power of the model as it reduced the specificity to 96.6%, incorrectly predicting that three cases would have recurrence when they did not.

From the individual logistic regression analyses, parents' belief in harsh parenting practices emerged as a significant predictor of maltreatment recurrence, although it reduced the predictive power of the model by incorrectly predicting two cases would have maltreatment when they did not. Of the covariates investigated, number of children in the home was a significant predictor, predicting higher likelihood of maltreatment recurrence. An augmenting interaction was found such that belief in harsh parenting

practices was more predictive of maltreatment recurrence for families with more children than for families with fewer children.

The finding that belief in harsh parenting practices predicted recurrence of child maltreatment was hypothesized based on social information processing theory (SIP). According to SIP, implementation of harsh parenting practices can be conceptualized as a four-step process: 1) attention to the child's behavior, 2) interpretation of the child's behavior, 3) decision making regarding what options are available to address the child's behavior and 4) implementation of the action to address the behavior. Belief in harsh parenting practices influences parents at Step 3, as parents who believe in harsh parenting practices may consider these actions as options, while it is at Step 4 where the line may be crossed between harsh but accepted punishment strategies and actions that constitute abuse. For parents for whom corporal punishment is not an acceptable form of managing child behavior, this option is not as readily accessed, harsh parenting is less likely to be implemented and there is less opportunity for things to go too far (Millner, 1993).

It should be noted that the most common type of recurrent child maltreatment found in this study was neglect. It is logical to anticipate how harsh parenting practices may increase the likelihood for physical abuse, however, it is more challenging to see the connection between these beliefs and neglectful parenting practices. While the current study is underpowered to detect the nuances between the predictors of interest and the types of maltreatment recurrence, of greater consideration is that the formal findings provided by CPS records may not fully characterize the types of maltreatment that occurred. On a national level, 75% of child maltreatment cases are classified as neglect and 17% are classified as physical abuse (NCANDS, 2015). While it may be that neglect

is in fact much more common than physical abuse, it may also be that neglectful parenting practices are easier to document and identify than physical abuse. Specifically, insufficient caregiving may be more readily detected by neighbors, teachers or home visits from CPS workers who can observe the environment and see that children are unsupervised or uncared for. Physical abuse, on the other hand, may be harder to detect and prove. Abusive acts are rarely witnessed directly, and marks and bruises can often be hidden or explained away as childhood accidents. It is therefore possible that in many maltreatment cases, “neglect” may be the formal finding but physical abuse may also be present. Alternatively, cases with physical abuse may not always reflect a general belief in harsh parenting practices if parents slip up momentarily.

In addition to belief in harsh parenting practices, number of children in the home was also found to significantly predict maltreatment recurrence, with greater family size resulting in increased probability for re-maltreatment. A significant interaction effect was also found indicating that belief in harsh parenting practices was more predictive of maltreatment recurrence for families with more children than for families with fewer children. Among possible explanations for this finding are that larger family size contributes to increased opportunity for conflict, thinner spread of resources and less individualized attention per child. In such environments, children may misbehave to increase their share of parental attention or because they are not being monitored. Under such circumstances, parents are more likely to feel they need to discipline children for misbehavior while having less time to reward positive behavior or to work with each child on individualized behavioral goals. As discussed above, at least two thirds of child maltreatment events begin as attempts to control unwanted behavior in children.

Results of the individual logistic regressions for the other predictors of interest and covariates were non-significant. This finding was most surprising for the analyses looking at severity of substance abuse, given that this factor has been such a robust predictor of maltreatment in past research (Fluke et al., 2008). One potential explanation for this finding is that the amount of substance abuse endorsed by the parents in the current study was very low, with a mean severity score of only .06 on a .00 to 1.0 scale, and a range of only .00 to .29. Data was collected close to the end of each parent's time in substance abuse treatment. Thus, if treatment was effective, it is possible that this data was captured at a time when the parent's substance use was at its lowest. It is possible that some parents relapsed during the 18-month study period following the data collection and those parents were more likely to have committed recurrent maltreatment. The current study was not designed to capture each parent's substance use following the data-collection time point. We were also unable to factor in dose effects of substance abuse treatment. It is possible that participants who were more engaged and compliant with substance abuse treatment were also more likely to provide post-treatment data, and less likely to have recurrence of maltreatment.

Another possible explanation for the null findings regarding parental substance abuse is that rather than severity of current substance use, some research suggests it is chronicity of substance abuse that confers the greatest risk for child maltreatment. For example, Kepple (2015) reported that individuals who have prolonged, heavy substance abuse of more than four years were at greater risk for committing physical abuse and neglect than individuals only experiencing the effects of current use or withdrawal (Janke van Holst & Schilt, 2011). Longer-term, more intense abuse may have more lasting

detrimental effects on executive control and disinhibition. It was beyond the scope of the current study to assess how lifetime use and severity may factor into maltreatment recurrence. Differentiating between the effects of current and lifetime substance abuse is an area for future investigation.

Results of the logistic regression looking at social conflict in predicting recurrent maltreatment were also non-significant. One potential explanation for this finding is that the current study did not capture all mechanisms of influence that may be at work when it comes to social support. Specifically, for some families, social conflict may increase likelihood for recurrent maltreatment through increased stress, fewer prosocial models of effective parenting and poor social functioning while for other families, social conflict may predict less maltreatment in that parents who are more socially engaged may prioritize socializing with friends over caring for their children. In a study examining the interaction between substance abuse and social support among families involved in the child welfare system, Kepple, 2015 found that moderate levels of social companionship were more predictive of parents engaging in neglectful behavior than low levels of social companionship. Ultimately, recurrence of child maltreatment may be more influenced by the types of social relationships parents engage in rather than the degree of conflict they experience.

Results of the logistic regression assessing parents' self-reported quality of life were also non-significant. This experimental factor may have been too broad a concept to differentiate individuals who are likely to repeatedly abuse their children from those who are not. One factor not assessed in this study that may overlap with quality of life but play a larger differentiating role in maltreatment recurrence is a parent's mental-

health functioning, such as symptoms of depression, anxiety, bipolar disorder or schizophrenia. Examining the role of a parent's mental health status beyond their substance use is another important area for future research.

Parental race, income and education level were also not found to significantly predict maltreatment recurrence. While the sample was diverse with respect to race, it clustered at the low end of both income and education. The limited range observed in these covariates may help account for the non-significant findings. However, these demographics are typical of the population involved in child welfare system and thus these factors may not be useful in predicting which families will have maltreatment recurrence.

Exploratory analyses looked at whether including "Unfounded" cases as recurrent would change the interpretation of the models. The results of these regressions did not differ much from the findings of the original analyses. The number of unfounded cases in this study was small and thus it is difficult to conclude if these cases differ significantly from cases where there were substantiated findings. Future research should continue to examine the long-term outcomes for children and families for whom investigations are opened but not founded.

The exploratory analysis looking at child out-of-home placement was also inconclusive when it came to differentiating cases with and without maltreatment recurrence. While it may seem that families whose children were not in the home at either of the data collection time points may have had less opportunity for maltreatment recurrence, the data showed that this was not the case. Of the 75 subjects who provided data for this analysis, eight families did not have their child in the home at either time,

and four out of these eight cases were identified for recurrence (a 50% recurrence rate). Out of the 67 cases where the child was in the home for at least one of the time points, 17 were identified for maltreatment recurrence (a 25% recurrence rate). While the sample size for this analysis was small, and the 75 participants who provided data at both time points may differ from the 42 participants who did not, this data suggests that families whose children are removed from their homes are not in-fact safe from maltreatment recurrence and that these families should therefore not be left out of future research in this area.

4.1 Limitations

There are several limitations to the use of logistic regression in this study that should be reviewed. First, the smaller sample size likely impacted the power of the regression to differentiate between families with and without recurrence. There is a generally accepted guideline in the field that when using logistic regression, there should be cases per each predictor in the smallest outcome group (Solomon, 2012). In the current study, there were 28 cases identified for recurrence but four predictors in the covariate regression analysis and eight predictors in the overall combined model, meaning that these analyses were likely underpowered to detect significant findings. Logistic regression is often more powerful in datasets in which the two outcome categories have a similar number of cases. In the current study, less than one quarter of cases were identified for maltreatment recurrence.

Another limitation that should be noted is the generalizability of these results to the larger population of parents with co-occurring substance abuse and child maltreatment. There may be significant differences between the population of parents

who choose to enroll in treatment studies compared with those who do not. Relatedly, participants from the larger study were only included in the current analyses if they provided data at the post-treatment time point. Of the 162 participants eligible at the time of these analyses, 117 had provided post-treatment assessment data. Those who did not provide post-treatment data may have differed in some significant way from those who did. For example, they may have completed less of their treatment, experienced more psychosocial risk factors or been less engaged or motivated for treatment generally.

External validity of these results is also limited by the fact that the data was collected as part of a treatment study. Most subjects in this study engaged in some form of substance abuse treatment, and approximately half of the sample attended at least some parent management training prior to the baseline data being collected. While the effects of these treatments are controlled for internally, they are not controlled for when generalizing the results to the larger population of child welfare-involved parents.

A third limitation of the design of this study is that the outcomes were coded based on official CPS records. It is possible (and likely) that maltreatment occurred in other families but that these incidents went unnoticed or unreported. Using official CPS data provides a more authentic picture of how maltreatment is identified in practice. However, this method may fail to capture incidents of maltreatment that are not identified through official investigation. To address this limitation, some previous research in this area has used parents' reports of their own maltreatment behaviors with measures such as the "Conflicts-Tactics Scale" (Kepple, 2015). While this measure may capture some incidents of maltreatment that would otherwise go unreported, some parents may be reluctant to reveal parenting practices they are ashamed of or that could put them at risk

for legal action. Ideally, future research would benefit from a multimodal approach, combining official records and self-report.

The limitations of self-report must also be considered across the predictors in this study. While the ASI-lite is accepted as a gold-standard measure of substance abuse and has strong psychometric backing, it has a high level of face validity. It is possible that participants underreported their substance use to present a more favorable impression. In the larger study, additional data on substance abuse was collected through urine and breathalyzer screens. Inclusion of this data may have identified increased levels of substance abuse in some participants not accounted for by the ASI-lite measure. However, participants knew when the screens would be given and may have altered the timing of their substance use accordingly. Additionally, use of such screens only provides a snap-shot of each participant's use and does not capture information about their usage trends over time the way the ASI-lite is intended to. Again, a more comprehensive multimodal approach combining self-report and biomarkers may be the most accurate method of capturing substance-use patterns and should be the goal of future research.

As with the ASI-lite's subscale measuring substance abuse severity, the subscale measuring social conflict presents similar limitations. In addition to high face validity, the measure only captures the amount of conflict participants experienced, without addressing the amount of support they received. It is possible that while a participant may experience more social conflict, they may also simultaneously experience strong support. Conversely, a participant who reported low conflict on the ASI-lite social conflict subscale may have little conflict because he or she has little social contact of any

kind and therefore has limited support as well (Rajerdran et al., 2015). Future research in this area would benefit from using a more comprehensive measure that captures both perceived social support and social conflict. Additionally, a more nuanced measure may be able to differentiate between tangible social supports (such as receiving financial assistance or help with child care) and emotional supports (such as advice and companionship) (Kepple, 2015).

The measures that addressed belief in harsh parenting practices and quality of life were also limited by face validity and the potential for presentation bias.

A final limitation in the current study is that we could not control for a parent's use of other treatment or services in the 18-month study period. It is possible that some parents received further substance abuse treatment, family counseling, parent management training or individual therapy during the interim which may have affected the variables of interest as well as the likelihood for recurrent maltreatment.

4.2 Future Directions

Improving the accuracy of risk assessment is important for preventing recurrent child maltreatment among families already involved with child protective services (Dorsey et al., 2008). Child protective service agencies are notoriously underfunded and under-resourced. Thus, efficient and effective allocation of resources is vital to the ongoing mission of protecting children and promoting family preservation (Font et al., 2015; Solomon, 2012).

Results of the current study suggest that parents' belief in harsh parenting practices may be an important factor differentiating families identified for maltreatment recurrence from those who are not. A logical extension of these findings is that efforts in

the field should focus on bolstering interventions aimed at changing parental cognitions and behaviors away from the use of harsh parenting practices. Many evidence-based parenting support interventions exist that do just this. Unfortunately, access to these services is limited, especially for those living in severe poverty and with low educational attainment, characteristics common to the child welfare population.

Additionally, past research has shown that substance-abusing parents involved in the child welfare system are often only provided referrals to substance abuse treatment, and not adjunctive parenting training (Berger et al., 2010). Results of the current study, as well as past research, suggest that substance abuse is by no means the sole contributor to child maltreatment and that families benefit most from a multipronged approach that addresses concurrent risk factors (Neger & Prinz, 2015).

As mentioned above, the scope of this current study was limited to a specific population and four hypothesized risk factors. While the four factors chosen here were reasonably likely to be related to child maltreatment, there are other variables that are likely candidates for predicting maltreatment recurrence as well. Additional variables worthy of examination include the severity of children's behavior problems, the parent's mental health, the parent's co-parenting status and the parent's own history of childhood maltreatment victimization.

Future research in this area should focus not just on clarifying more explicitly the factors that differentiate individuals who recommit maltreatment from those who do not, but also on increasing access to effective services needed to address and mitigate these risk factors.

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