Parental Mental Health Problems and Substance Abuse, and Child Welfare Decision-Making in a Sample of Northern California Households Investigated for Maltreatment

by

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Abstract

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Child maltreatment is an issue of pressing concern in the United States. As researchers and providers work to stem the tide of the opioid epidemic, increased funding has been allocated to address the associated rise in maltreatment and foster care entry. This places pressure on child welfare providers to implement more effective strategies in maltreatment cases involving parental substance abuse and mental health problems. Implementing effective intervention and prevention strategies for households affected by mental health problems or substance abuse requires that child welfare providers understand why these households are at increased risk of penetrating the system, and what factors might mitigate this risk. Fortunately, the popularization of actuarial child welfare decision-making frameworks has resulted in a growing body of administrative data that is available to researchers interested in understanding how workers make determinations about households at each juncture in the system. In California, critical decision-making junctures include whether to investigate a report, whether a child can remain safely in the home during an investigation, and whether to open a case, among others. For households affected by parental mental health problems or substance abuse, analysis of child welfare decision-making data has the potential to expose why they are at increased risk of more serious involvement, as well as identify factors that may guard against future involvement. Such knowledge may inform early intervention and prevention strategies for these parents and their children. To that end, this dissertation examines several critical junctures in the child welfare decision-making process using administrative data collected on 4,070 households referred for the first time for maltreatment allegations in San Francisco County. Chapter 1 applies mediation analysis to an inventory of safety threats in order to account for why workers are more likely to remove children from the home during an investigation if a parent has mental health problems or substance abuse. Chapter 2 uses moderation analysis to examine which protective factors are present when workers decide that children of parents with mental health problems or substance abuse can remain in the home despite the presence of safety threats. Chapter 3 examines associations between safety decisions and likelihood of several key child welfare outcomes, including allegation substantiation, in- and out-of-home case openings, and maltreatment re-referral. Taken together, dissertation results provide a more in-depth perspective on how and why parents with mental health problems or substance abuse and their children become more seriously involved in the child welfare system, and what might prevent that involvement in the future. When parental mental health problems and substance abuse are present, workers tend to

document evidence of prior maltreatment, unmet immediate needs, and prenatal exposure to substances, but not physical abuse; the combination of these safety threats puts children at increased risk of being determined unsafe in the home. This increased risk appears to be mitigated by greater numbers of protective factors, although specific factors such as child and caregiver capacity, history of problem-solving, and willingness to take protective action appear to have individual protective effects. When parental mental health problems or substance abuse are present, workers are more likely to change their safety decisions during an investigation, and are more likely to substantiate allegations and open cases, both in- and out-of-home, even among households whose children have been determined safe. However, parental mental health problems or substance abuse do not increase risk of maltreatment re-referral, an indication that child welfare intervention may reduce recurrence.

This dissertation is dedicated to the invisible children.

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Overview

Maltreatment

With more than seven million children referred for allegations of abuse or neglect each year, and nine in 1,000 being victims of substantiated allegations, child maltreatment is an issue of critical importance in the United States (U.S. Department of Health & Human Services et al., 2019). Most commonly occurring in the form of general neglect (75%) or physical abuse (18%; DHHS, 2019), child maltreatment is associated with a variety of adverse developmental outcomes, both proximal and distal. Survivors of maltreatment experience increased risk of social, emotional, and behavioral problems, obesity, alcohol problems, and suicide, and decreased educational and occupational attainment (Currie & Spatz Widom, 2010; Gilbert et al., 2009; Lansford et al., 2002). In 2008, new maltreatment cases cost the United States more than $124 billion in lifetime expenses (Fang et al., 2012).

Numerous child, parent, and socioeconomic factors are associated with increased risk of child maltreatment. Children under the age of one are victimized at nearly three times the average rate (25.3 per 1,000), and girls are victimized at a higher rate than boys (9.5 vs 8.6 per 1,000). Victimization rates are highest among American Indian/Alaska Native children (14.3 per 1,000), followed by Black/African American children (13.9 per 1,000; DHHS, 2019). Other child factors such as low IQ and birth complications also increase risk of maltreatment (Brown et al., 1998; Sullivan & Knutson, 2000). Parents perpetrate 78% of maltreatment (DHHS, 2019), and family characteristics such as large household size, lower maternal age, parental maltreatment history, low parenting warmth and responsiveness, parental mental health problems, and parental substance use have all been shown to increase risk of child maltreatment (Brown et al., 1998; Chaffin et al., 1996; Gilbert et al., 2009; Stith et al., 2009; Walsh et al., 2003). Factors such as parental low educational attainment, poverty, and receipt of welfare assistance have also been shown to increase risk (Brown et al., 1998; Gilbert et al., 2009).

Parental Mental Illness and Substance Abuse

Every year in the United States, 19% of adults meet criteria for mental illness, with 5% experiencing severe mental illness (Center for Behavioral Health Statistics and Quality & Substance Abuse and Mental Health Services Administration, 2018). Substance abuse is common among adults with mental illness, with 8% reporting illicit drug use disorder, and 12% reporting alcohol use disorder (CBHSQ, 2018). Mental illness accounts for six of the leading 20 causes of disability worldwide, including major depression, anxiety disorder, schizophrenia, and bipolar disorder (Vos et al., 2015). Mental illness increases risk of a number of health problems across the lifespan, including cardiovascular and respiratory disease, diabetes, and cancer (Carney et al., 2006; Das-Munshi et al., 2017). Among adults with serious mental illness, suicide is responsible for the greatest number of potential years of life lost (B. J. Miller et al., 2008).

Eighteen percent of parents experience mental illness every year, and parental mental illness is associated with caretaking and child development problems from infancy to adulthood. During infancy and childhood, parental mental illness is associated with decreased maternal responsiveness and child problems with frustration and anger, attachment, language development, social cognition, and social-emotional competence (Russell et al., 2016; Wang & Dix, 2015). In adolescence, parental mental illness is associated with permissive parenting practices, worse child academic outcomes, and increases in child externalizing behaviors, including aggression and rule-breaking (Van Loon et al., 2014, 2015). Lifetime risk of psychiatric morbidity is significantly higher among children of parents with mental illness;

compared to children of parents without mental illness, they experience up to five times the odds of mental illness (McLaughlin et al., 2012).

Both parental mental illness and substance abuse are associated with increased risk of involvement across all levels of the child welfare system, from initial referral to out-of-home placement. To begin with, parents with mental illness are more likely to commit maltreatment. For instance, one national longitudinal study of 7,103 parents found that parental depression increased risk of physical abuse nearly three-fold (Chaffin et al., 1996). Parental mental health problems also increase the likelihood that a maltreatment allegation is substantiated, according to one national study in Canada (Westad & McConnell, 2012).

Child welfare responses to maltreatment are more serious among parents with mental illness. A New England study of 4,827 Medicaid-eligible mothers found that in-home maltreatment preventive services and child out-of-home placement were significantly more common among mothers with serious (15%) and non-serious (11%) mental illness than among those with no mental illness (4.2%; Park et al., 2006). The Canadian study also found that out-of-home placement, ongoing child welfare services, and applications made to the court were also more common among mothers with versus without mental health problems (Westad & McConnell, 2012). Chronicity of mental illness increases risk of child removal. For instance, a longitudinal study of 322 mothers with mental illness found that the odds of custody loss increased 8% for each lifetime inpatient psychiatric admission (Hollingsworth, 2004).

Parental substance abuse, frequently comorbid with mental illness, also increases risk of maltreatment. Significantly higher rates of alcohol and/or substance abuse or dependence have been observed in maltreating (30%) versus non-maltreating mothers (2%; De Bellis et al., 2001). Studies have found that parental substance abuse increases risk of physical and sexual abuse, as well as neglect (Chaffin et al., 1996; Walsh et al., 2003). In 2017, caregiver alcohol abuse was a contributing factor in 12% of substantiated reports of maltreatment, and caregiver drug abuse was a contributing factor in 31% (DHHS, 2019). Odds of child removal are higher among parents with co-occurring mental illness and substance use than among parents with either issue alone (Roscoe et al., 2018).

The Opioid Epidemic

With the rise of the opioid epidemic, known associations between parental mental illness, substance abuse, and maltreatment have garnered national attention. Foster care rates, which had been decreasing steadily for nearly ten years, began to rise in 2012—a shift that researchers observed was contemporaneous with rising rates of opioid abuse. With little empirical research to support this observation, the U.S. Department of Health and Human Services launched a nation-wide study that documented a number of critical findings (Radel et al., 2018). First, the study found a high positive correlation between drug overdose rates and foster care entry rates at the county level, specifically in the Pacific Northwest, New England, the Southwest, Appalachia, and Oklahoma (see Figure 1). In a given county nationwide, a 10 percent increase in the overdose death rate corresponded to a 4.4 percent increase in the foster care entry rate, and a 10 percent increase in the drug-related hospitalization rate corresponded to a 2.9 percent increase in foster care entry rate.

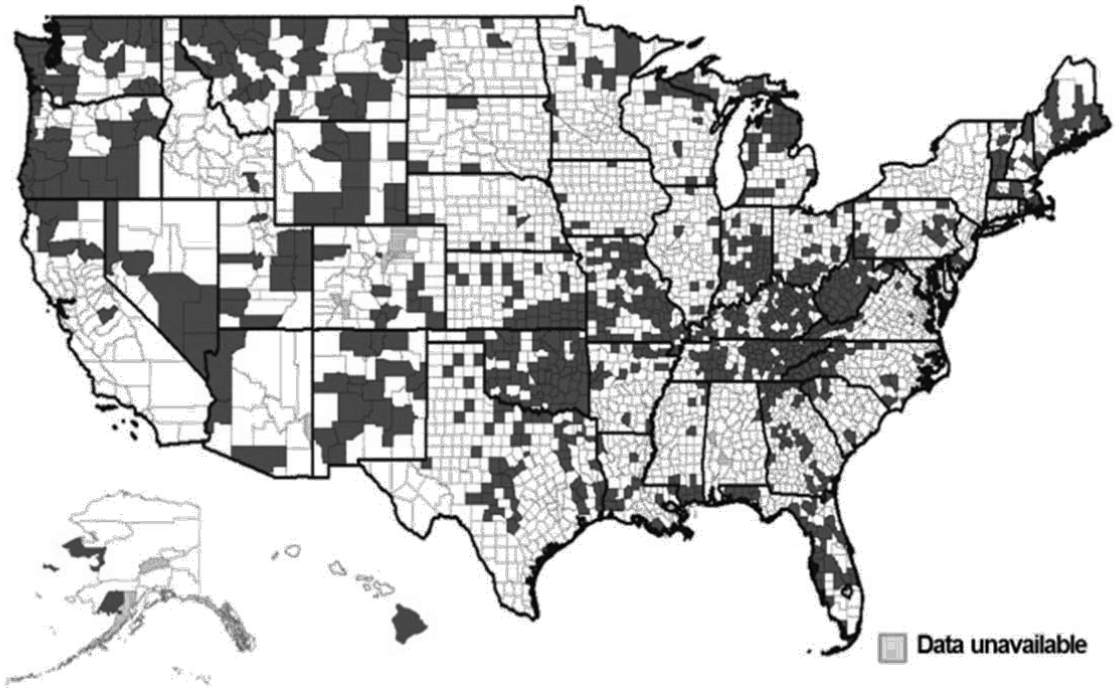

Figure 1. Counties with rates of drug overdose deaths and foster care entries both above the national median in 2016 (Radel et al., 2018).

"Sources: CDC/NCHS, National Vital Statistics System, Mortality; HHS/ACF, Adoption and Foster Care Analysis and Reporting System." (Radel et al., 2018, p. 3)

Second, the study found that substance abuse correlated with case complexity and severity; counties with higher proportions of parents who overdosed or were hospitalized were also counties with households who penetrated further into the child welfare system. Cases involving parental substance abuse—specifically opioid abuse—typically involved greater levels of neglect, and substance abuse cases in general involved fewer external supports, and parents who were less compliant with court proceedings (Ghertner et al., 2018). Third, the study found that opioid-related overdoses and hospitalizations were associated with the largest increases in foster care entry compared to other substances (Radel et al., 2018).

In addition to its main findings, the study included a number of overall observations and recommendations. First, it emphasized the scope of treatment concerns that often co-occur with parental substance abuse, specifically mental illness, domestic violence, trauma, and economic disadvantage. It enumerated challenges to treatment, including poor substance use assessment quality and timeliness, and shortages of family-friendly treatment options. Second, it noted a number of child welfare response issues, including worker burnout, placement shortages, disjunction between child welfare and substance abuse treatment providers, and the perceived inadequacy of differential response (non-investigative, voluntary community support services) as an option for cases involving parental substance abuse. Aware of the unpredictability of addiction recovery and the high levels of maltreatment that tended to co-occur with parental substance abuse, workers likely worried that voluntary service referrals for these households might ultimately constitute acts of nonfeasance (Radel et al., 2018). Taken together, the study's findings describe on a national scale a crisis of addiction, mental illness, and maltreatment that warrants revision of the investigative and intervention practices currently in use.

The Family First Preservation Services Act

A critical legislative milestone in the response to this crisis was the 2018 signing of The Family First Preservation Services Act. The Act permitted child welfare providers to use Title IV-E funds (which until then had covered exclusively foster care and adoption expenses) for evidence-based parent mental health and substance use prevention and intervention programs, as well as in-home parent skills training and education programs, and individual or family counseling. The purpose of this funding allocation was to preserve family unity, ensure safety and well-being, and reduce risk of maltreatment recurrence among children at imminent risk of removal (Family First Prevention Services Act, 2018). Minimum program requirements for Title IV-E reimbursement include a standardized implementation protocol, empirical evidence of intervention effectiveness and no empirical evidence suggesting that the intervention causes more harm than good, empirical evidence of superiority to an appropriate comparison intervention, and consistent administration of reliable and valid outcome measures (Lindell et al., 2020).

In accordance with the Act, federal agencies are continually developing a clearinghouse of interventions that meet and often exceed, the minimum requirements (Administration for Children and Families & U.S. Department of Health and Human Services, n.d.). These include such widely-regarded interventions as Multisystemic Therapy (Henggeler et al., 1998), Brief Strategic Family Therapy (Szapocznik & Williams, 2000), and Nurse-Family Partnership (Leslie et al., 2016), among others. This arsenal of intervention options allows workers to pursue a variety of treatment objectives, including stimulating motivation for behavior change, improving intrafamilial communication, honing child and parenting skills, and targeting family-specific needs and goals such as material resources, education, and career aspirations. Although programs need not demonstrate empirical evidence gathered from a child welfare sample in order to meet the Act's requirements, many were designed and tested specifically with maltreatment prevention in mind. Moreover, a number of programs were vetted based on favorable outcomes among households with both maltreatment concerns and parental substance abuse or mental illness (e.g., Multisystemic Therapy, Brief Strategic Family Therapy, Healthy Families America; ACF & DHHS, n.d.). Recognizing that parental substance abuse and mental illness play a critical role in the current foster care upsurge, providers wishing to prevent placement among these at-risk children require interventions that uniquely target the factors that increase their risk of placement, as well as the those that guard against it.

Prevention and Protection

To mitigate risk of negative outcomes, preventive interventions traditionally focus on fostering resilience through the cultivation of protective factors. Resilience has been defined as "good outcomes in spite of serious threats to adaptation or development" (Masten, 2001, p. 228), and is typically viewed as a non-linear process with setbacks as well as turning points (Luthar, 1991; Masten, 2001). Researchers interested in the development of resilience often examine how factors such as intelligence, social support, or education mitigate the effects of specific risk factors; in other words, they test for protective effects (Masten, 2015, pp. 44–48). For example, internal locus of control (the belief that one has control over one's life) has been found to protect against the effects of stress on children's assertiveness in the classroom (Luthar, 1991).

Concepts related to protection have been examined by scholars in various fields adjacent to, and overlapping with, resilience; these fields include positive youth development (Catalano et al., 2004), applied behavioral analysis (Goldiamond, 1974), and strengths-based social work (Saleebey, 2002), among others. Resilience researchers distinguish the concept of protection

from other related concepts such as "strengths," however. Whereas a strength is generally defined as an emotional or behavioral competency, a protective factor is an individual, familial, or community characteristic that reduces the risk of the negative outcome associated with a specific risk factor or risk factors (Probst, 2009). This dissertation examines protective factors as so defined.

Protective factors tend to fall into one of three categories: personal (e.g., gender, temperament, IQ), family (e.g., parent-child relationship), and community (e.g., institutional ties). This broadly accepted triad of protective factors emerged from early studies of resilience (e.g., Werner & Smith, 1982), and has garnered substantial empirical support over decades of related research examining individuals with a wide range of risk factors. These factors include exposure to chronic stress (Luthar, 1991; Luthar et al., 1993; Masten et al., 1999; Masten & Tellegen, 2012), parental mental illness (Collishaw, Hammerton, et al., 2016), terrorism (Bonanno et al., 2007; Hobfoll et al., 2009), and maltreatment (Bartlett & Easterbrooks, 2015; Cicchetti et al., 1993; Collishaw, Pickles, et al., 2016, 2016; Dixon et al., 2009; DuMont et al., 2007; Herrenkohl et al., 2005; Jaffee et al., 2007; Schultz et al., 2009), among many others.

In the maltreatment literature, researchers have documented evidence of a number of personal, family, and community factors that protect against maltreatment or its long-term effects. High IQ has been found to protect against the effects of maltreatment, as has male gender (Jaffee et al., 2007). However, at least one other study found that female children were more resilient to maltreatment (DuMont et al., 2007). Race has been associated with resilience to maltreatment, specifically among non-white individuals (DuMont et al., 2007). Social competence and adaptive functioning skills have also been associated with better mental health and school outcomes (Schultz et al., 2009). A "reserved, controlled, and rational" temperament has been linked to resilience in maltreated children (Cicchetti et al., 1993, p. 643). One study even found that financial solvency distinguished parents who broke intergenerational cycles of maltreatment from those who maintained them (Dixon et al., 2009).

Family factors appear to function protectively as well. A study of maltreatment and resilience among 364 individuals followed longitudinally from childhood found that the presence of a caring parent was protective against adult onset of psychopathology among maltreated children (Collishaw, Pickles, et al., 2016). In one study of 457 youth, having a parent who disapproved of antisocial behavior was associated with lower risk of antisocial behavior among those maltreated (Herrenkohl et al., 2005). A stable home environment and a supportive partner have also been associated with resilience in maltreated children (DuMont et al., 2007)

Social and community factors appear to confer a protective effect, in particular social support. One study found that among mothers with a childhood history of maltreatment, those with better social support had higher levels of maternal empathy, an attribute associated with lower risk of maltreatment (Bartlett & Easterbrooks, 2015). Among mothers without a high school education, those with better social support have been found to exhibit lower risk of maltreating their children (Li et al., 2011). Another longitudinal study of 364 maltreated children found that good peer relationships were protective against adult onset of psychopathology (Collishaw, Pickles, et al., 2016). Social support has also distinguished parents who broke the cycle of intergenerational maltreatment from those who maintained it (Dixon et al., 2009). Relationships with peers who disapprove of antisocial behavior also appear to reduce risk of antisocial behavior in maltreated youth (Herrenkohl et al., 2005). Community factors such as lower crime rate have also been linked to resilience in maltreated youth (Herrenkohl et al., 2005; Jaffee et al., 2007).

Whether explicitly or implicitly, many programs vetted by the Title IV- E Prevention Services Clearinghouse draw upon these concepts of resilience and protection in the form of strategies intended to cultivate adaptive skills and behavioral repertoires, deepen family bondedness, and strengthen social and community supports. Further research into protective processes among child welfare-involved parents with mental illness or substance abuse has the potential to inform refinements to current treatment approaches, thereby helping providers more effectively intervene on current maltreatment and prevent its recurrence in this population.

Child Welfare Decision-Making

Before services can be delivered, child welfare providers must make a number of decisions about a given maltreatment referral. The child welfare system can be thought of as a portal leading to a series of critical junctures or "gates", through which parents and children pass or do not pass depending on whether workers decide to screen in a referral for investigation, open a case, place a child out-of-home, or reunite a family (Gelles, 2017, pp. 95–104). Decisions about child maltreatment referrals—especially whether or not to remove a child from the home—are among the most challenging a worker must make. Until recent, however, the gravity of child welfare decision-making was not reflected by the rigor of the decision-making apparatus.

Historically, child welfare decisions were made based on clinical judgment, a combination of "case study, intuitive judgment, and/or the worker's professional experience" (Gelles, 2017, p. 105). This decision-making framework was prone to unreliability and bias, however, which had the potential to negatively influence worker's perceptions, perhaps especially when investigating maltreatment allegations involving parents with mental health problems or substance abuse. News media is proliferated with stories linking parental mental health problems and substance abuse to severe child maltreatment and filicide. Indeed, the topic of parental mental illness, especially in women, tends to elicit underlying fears about child maltreatment. This "mad women" myth (Rapaport, 2006) is only one feature of the pervasive stigma that surrounds mental illness, contributing to a public perception that parental mental health problems are ipso facto threats to child safety.

The majority of contemporary child welfare providers in the United States have since adopted an actuarial decision-making framework called the Structured Decision Making® (SDM) System, consisting of standardized, empirically-based inventories of risk and protective factors and threats to child safety. The SDM model guides workers' decision-making throughout the maltreatment referral process. Critical decisions include whether or not to investigate a referral, open a case, place a child out-of-home, or reunify a family after placement (NCCD, 2015). SDM is widely used both nationally and internationally, including in 38 states and all 58 California counties (CDSS, n.d.). A limited body of psychometric literature has found the SDM risk assessment to have good validity in terms of predicting maltreatment recurrence rates (Johnson, 2004). High correlation between the safety and risk assessments also suggests that SDM tools are measuring the same set of concepts related to maltreating behaviors and risks (Johnson, 2004). The framework has also demonstrated positive results in at least one study of child welfare decision-making and service delivery. A pilot study of 2,000 families in Michigan found that, relative to control counties, those implementing SDM had higher service provision rates when cases were opened, lower re-referrals rates when cases were not opened, and fewer new substantiations and placements overall during the one-year follow-up period (Baird et al., 1995).

Though actuarial tools such as the SDM represent advances in child welfare decision-making, they have not gone uncriticized. Workers using actuarial tools similar to the SDM have

been found to inflate scores in order to achieve specific outcomes such as child placement (Lyle & Graham, 2000). Several studies of the SDM indicate that workers think the framework inhibits the development of the professional expertise that is necessary for making judicious decisions, and that it was adopted by administrators principally as an accountability tool (Gillingham, 2011; Gillingham & Humphreys, 2009). On the other hand, scholars are wary of newer alternatives to actuarial tools, such as predictive analytic approaches, which may reinforce existing biases (Gelles, 2017) and may further inhibit the development of professional expertise by distancing workers from the decision-making process.

Because the majority of child welfare providers in the United States continue to implement the SDM in routine practice, this means in theory that for the bulk of child welfare-involved families, the system's gates open and shut based on its decision-making rationale. Considering the complexity that defines maltreatment referrals involving parental mental illness and substance abuse, child welfare providers require a decision-making framework that assesses case factors with precision and reliability. The field would benefit from knowing what role actuarial decision-making tools such as the SDM play at the critical junctures these families face as they penetrate the child welfare system.

Chapter Review

Chapter 1. In the context of maltreatment referrals involving parental mental health problems or substance abuse, the SDM framework implies that parental mental health problems or substance abuse constitute safety threats only if their behavioral symptoms put a child's immediate health and well-being at risk. The shift away from clinical judgment, which may have unfairly prejudiced parents with mental illness, has exposed a gap in our understanding of why children of parents with mental health problems or substance abuse are more likely to be determined unsafe in the home. If SDM does not allow workers to make decisions based on the presence of parental mental illness or substance abuse, what evidence are they documenting that disproportionately removes children of parents with mental illness or substance abuse from the home? Chapter 1 of this dissertation fills this gap by accounting for the effects of parental mental health problems and substance abuse on risk of an "unsafe" determination in the form of documented behavioral threats to child safety.

Chapter 2. Actuarial child welfare decision-making frameworks such as SDM not only standardize a worker's approach to gathering information about threats to child safety in the home, but also counter-balance this threat assessment with an assessment of family protective factors and possible safety interventions. In the context of such a decision-making framework, current threats to child safety may be sufficiently mitigated by other factors that a child can safely remain in the home while a worker continues the investigation. Especially because parental mental health problems and substance abuse increase the risk of child removal, such a decision-making framework may preserve family unity where unity would have previously been sacrificed. Chapter 2 analyzes in-depth the role that protective factors play in mitigating threats to child safety among households in which parents experience mental health problems or substance abuse. Identifying factors that protect against child removal may help child welfare workers preserve family unity during and after investigations. Moreover, fostering such protective factors may also prevent maltreatment recurrence.

Chapter 3. The shift from clinical judgment to actuarial decision-making puts greater demand on a worker to gather comprehensive and accurate information during a maltreatment investigation. Obtaining such information is crucial to conducting a judicious investigation and delivering appropriate interventions when applicable. However, child welfare workers must

balance the duty to investigate thoroughly with the duty to make timely decisions about children's safety and to render services without delay. In California, policy mandates that investigated maltreatment referrals be "closed" within 30 days. Given that maltreatment frequently occurs amid high levels of turmoil and uncertainty, 30 days can be insufficient to fully appreciate a given household's circumstances. This may be especially true for families with parental mental health problems or substance abuse, known to be associated with increased case complexity (Ghertner et al., 2018). For these families, decisions about child safety may well vary depending on what a worker documents on a given day of the investigation. Chapter 3 examines what happens to families after an initial safety decision is rendered, including whether or not the safety decision changes, maltreatment allegations are substantiated, and in- or out-of-home cases are opened. The chapter also examines the likelihood of maltreatment re-referral, adjusting for investigative findings and other relevant referral characteristics.

Chapter 1

Child safety decisions and parental mental health problems: A new analysis of mediating factors

Abstract

Background: Among parents investigated for maltreatment, those with mental health problems or substance abuse are more likely to have children removed from the home, but until recently, the decision-making that leads to such increased risk has not been fully examined. Prior research on this topic suffers from several sampling and analytic limitations that affect validity.
Methods: In the present analysis, intended to address these limitations, we apply structural equation modeling to a sample of 4,070 Structured Decision Making® assessments administered in San Francisco, CA, from 2007-2015, identifying safety threats that account for reasons why workers frequently determine children of parents with mental health problems and substance abuse unsafe in the home.
Results: Odds of unsafe determinations doubled among the 6% of parents with mental health problems and quadrupled among the 5% with co-occurring substance abuse. Four safety threats explained 96% of the effect of mental health problems on safety decision, two of which retained statistical significance in our final model: Failure to Meet Immediate Needs and Previous Maltreatment. Ninety-four percent of the effect of co-occurring mental health problems and substance abuse was due to seven safety threats, two of which were significant in our final model: Failure to Meet Immediate Needs and Physical Harm (Drug-Exposed Infant).
Conclusions: Findings highlight the importance of identifying the specific threats that put children's safety at risk, rather than assuming that parental conditions are necessarily risk factors. By focusing intervention and prevention efforts on threats most associated with unsafe determinations, we may prevent recurrent child welfare involvement among parents with mental health problems and substance abuse.

Keywords: Mental health; Substance abuse; Child welfare; Decision-making; Structural equation modeling

1.1. Introduction

When a household is investigated for maltreatment, workers must make timely decisions about child safety—critically, whether or not a child may safely remain in the home. Although parental mental health problems and substance abuse are well-known risk factors for out-of-home placement (Park et al., 2006; Westad & McConnell, 2012), workers' on-the-ground decision-making processes as related to such risk are under-investigated. In response to our previous study (Roscoe et al., 2018), we present a new analysis examining which safety threats, as assessed by child protection workers, explain increased risk of unsafe determinations when parents have mental health problems with or without substance abuse. These findings may help guide service planning for this population, with the potential to reduce the likelihood of maltreatment recurrence.

Maltreatment, Mental Illness, and Substance Abuse

In the United States, 9.4 children in 1,000 are victims of substantiated maltreatment (although actual rates are likely to be far higher), over 90% of which is perpetrated by parents (Administration for Children and Families & U. S. Department of Health & Human Services, 2016). Eighteen percent of parents in the general population experience psychiatric disorder every year (Stambaugh et al., 2017), and parental mental illness increases risk of involvement across the child welfare system, including substantiated maltreatment allegations, in-home maltreatment preventive services, child removal, ongoing child welfare services, and protection applications made to the court (Park et al., 2006; Westad & McConnell, 2012). Roughly 74% of child welfare-involved mothers with mental illness experience major depression (72%), with diagnoses such as dysthymia (45%), posttraumatic stress disorder (43%), and anxiety disorder (17%) somewhat less common, and psychotic disorders like schizophrenia (2%) rare (De Bellis et al., 2001).

Chronicity and comorbidity play roles in the association between mental illness and parental maltreatment of their children. More chronic mental illness is associated with more serious child welfare involvement; in one study, the odds of custody loss increased 8% for every additional inpatient psychiatric admission (Hollingsworth, 2004). Substance use is also common in this population, co-occurring in 18% of adults with mental illness (Center for Behavioral Health Statistics and Quality & Substance Abuse and Mental Health Services Administration, 2016), though this estimate is likely low. Parental substance abuse is itself a risk factor for maltreatment, including physical and sexual abuse, and neglect (Chaffin & Friedrich, 2004; Walsh et al., 2003), and comorbid parental mental illness and substance abuse have been linked to higher risk of placement than either condition alone (Roscoe et al., 2018). Taken together, mental illness and substance abuse constitute serious risk factors for child welfare involvement, yet the manner in which they influence protection decisions is not clearly understood.

Child Protection Decision-Making

In more than 30 states, including California, child protection workers conduct in-home assessments of child safety using a decision-making tool that includes an inventory of safety threats such as unmet basic needs, hazardous living conditions, and signs of physical abuse, among others (California Department of Social Services, n.d.). Child safety in the home is determined largely, though not exclusively, on such threat assessment. In the past, some safety assessments included parental mental illness, meaning that the mere presence of a parent with mental illness could be considered a threat to the child's safety (DePanfilis & Scannapieco, 1994; Pecora, 1991). By contrast, the safety assessment used in California and most of the United States incorporates mental illness into the safety decision-making process only if the

parent's behavior constitutes a current observable safety threat to the child—e.g., if the "caregiver's emotional stability, developmental status, or cognitive deficiency seriously impairs his/her ability to supervise, protect, or care for the child" (*California Safety Assessment*, 2012). Under these decision-making protocols, a caregiver's mental illness alone (i.e., in the absence of any other threat to child safety) is not cause for child removal, though other responses (e.g., case opening) may be initiated.

Despite their popularity, such protection decision-making tools are rarely analyzed in studies of risk factors for child removal. Rather, studies often identify risk factors based on associations between referral information (including parental mental illness) and child removal, without explaining how these "risk factors" constituted threats to child safety during the protection decision-making process (e.g., Zuravin & DePanfilis, 1997). In the absence of this crucial information, it could be erroneously concluded that parental mental illness is in and of itself the threat to child safety—a misattribution that is highly likely to increase mental health stigma. The field requires a more precise understanding of what workers document first-hand when assessing safety in households in which a parent experiences mental illness with or without substance abuse.

In a previous study, Roscoe et al. (2018) found that a narrow profile of safety threats explained most of the effect of mental health problems, 71% of the effect of substance abuse, and 55% of the effect of co-occurring mental health problems and substance abuse on safety decision. Threats included "Caregiving Impairment due to Emotional/Developmental/Cognitive Deficiency" and "Failure to Meet Immediate Needs," among others. Although the first to explain safety decision-making in the context of parental mental health problems, this analysis suffered from key limitations. First, mental health problems and substance abuse indicators were recorded subsequent to safety threat assessment and safety decision, making causal interpretations of the results ambiguous. Second, Roscoe et al. (2018) developed multiple mediator models by including significant mediators from single models in a stepwise fashion; this method is not congruent with best practices for multiple mediation modeling, which specify that all mediator effects and covariances should be measured simultaneously in one model to accurately measure each mediator's contribution to the total indirect effect (Preacher & Hayes, 2008).

The Present Study

Herein, we respond to each of the above limitations. To address the issue of temporal precedence, we include two measures of mental health problems: current (i.e., during the past year) and chronic (i.e., prior to the past year). We also measure multiple mediation models according to recommended structural equation modeling (SEM) practices. Thus, we attempt to more precisely isolate the safety threats that account for unsafe determinations involving parents with mental health problems and substance use. In so doing, we may enable child welfare practices that can target areas of greatest need and concern among families affected by parental mental health problems and substance abuse, potentially reducing risk of more serious or recurrent involvement in this population.

1.2. Methods

Study Context

We examine child maltreatment referrals and assessments documented by the division of Family and Children's Services (FCS) within the Human Services Agency, which is San Francisco's public child welfare agency. FCS administers all procedures involving child maltreatment referral, screening, and assessment, as well as in- and out-of-home services. FCS uses the Structured Decision Making® (SDM) System (*The Structured Decision Making®*

System Policy and Procedures Manual, 2015) to guide assessment and decision-making for maltreatment referrals. An initial hotline assessment determines whether a referral warrants an investigation; roughly half of referrals are investigated in San Francisco County each year. The subsequent investigation involves administration of the SDM safety assessment tool, which evaluates the current safety of children in the home within 10 days of referral, and the SDM risk assessment, which assesses the likelihood of future threats to child safety and helps determine whether an ongoing case should be opened (NCCD, 2015). When at least one threat to child safety is documented on the safety assessment, the risk assessment must be completed within 30 days. Absent any safety threats, the risk assessment is recommended but not required. Together, these assessments provide the evidence necessary to evaluate maltreatment allegations, as well as inform service and placement dispositions.

Sample

Our interest is in early assessment and intervention involving households affected by parental mental health problems, so we included in our sample households in which parents were screened for maltreatment concerns for the first time by FCS in California. We examined referrals with only both safety and risk assessments because the former assesses safety threats, whereas the latter assesses mental health and substance use. The majority of SDM safety assessments conducted in San Francisco County used Version 2 of the assessment, starting on 1/1/2007 and ending on 10/31/2015, with the first documented use of Version 3. Because of substantial differences between versions, we included in our sample only those households involving parents screened for the first time using Version 2.

Of all 44,566 unique referrals made during the study window, 38,836 involved households in which a mother and/or father was identified as an alleged abuser (see Figure 1.1). Of these, 16,163 were first-time referrals for the mother and/or father. Less than half of these referrals (7,269) received a safety assessment, and 4,261 received safety and risk assessments. Of those, 3,393 had safety assessments performed within 10 days of referral and risk assessments performed within 30 days of safety assessment, per San Francisco policy.

Many safety assessments were performed outside the required 10-day window; in fact, 681 households received safety assessments 11-30 days following referral. Such late assessments were not uncommon because workers were required to transfer assessments completed in the field to an electronic record, resulting in a delay; late assessments were also more common during the early implementation of SDM, when staff were less familiar with the new paperwork and practices. These late assessments were included in the final sample to increase statistical power and so that inferences would be more generalizable to the population of households that receive assessments. Table A1 shows that the safety assessment's timeliness had minimal effect on the association between mental health/substance abuse status and safety decision, and thus did not meet criteria as a confounder per Jewell (2004). The final sample consisted of 4,072 matched safety and risk assessments. Two of these were excluded from analyses because mental health and substance abuse information was missing. Thirty-five percent (n=1,420) of safety assessments received required risk assessments related to documentation of at least one safety threat (mean safety threats=1.68, sd=1.13). The remaining 65% (n=2,650) received recommended risk assessments at the worker's discretion.

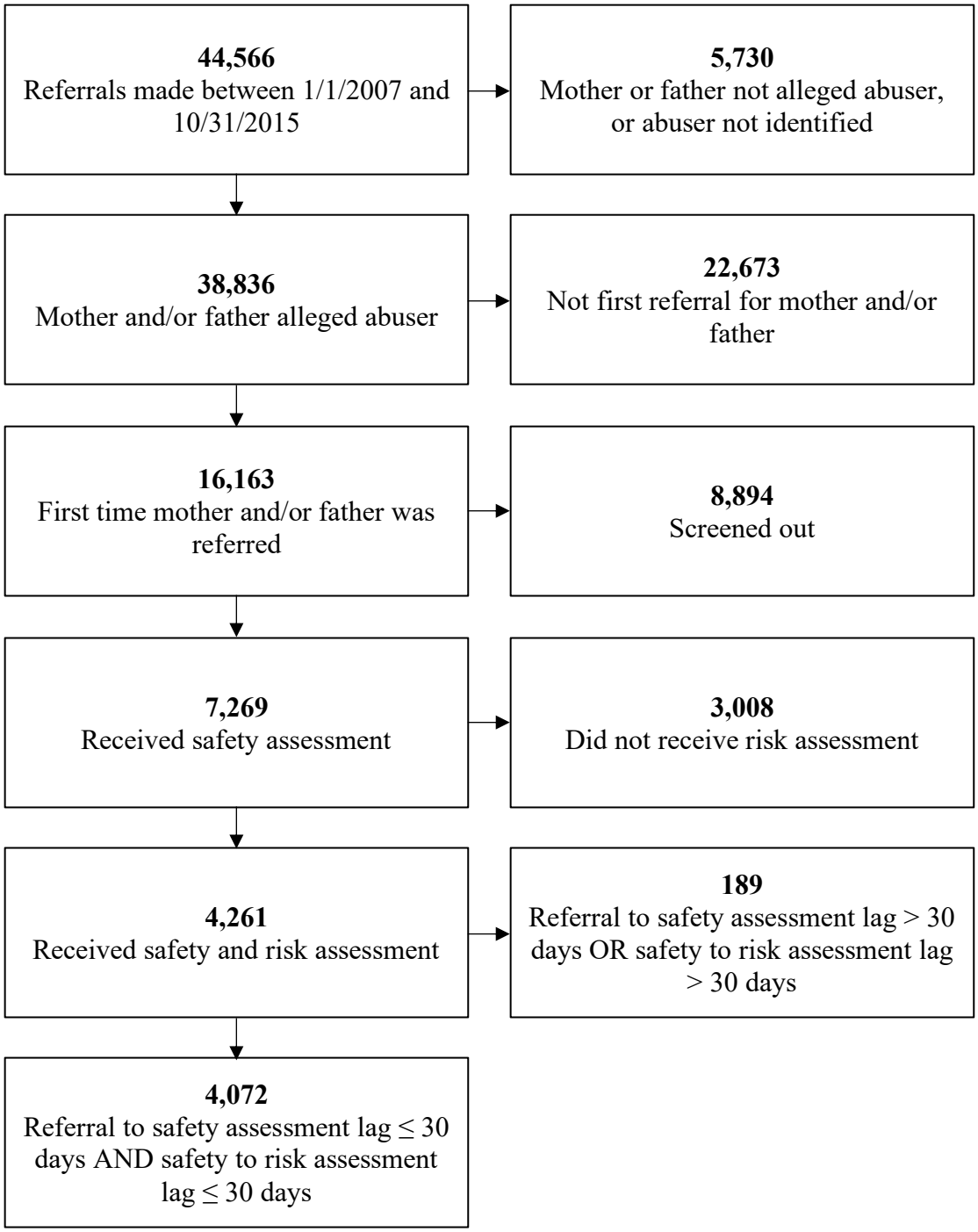

Figure 1.1. Data merge and sample selection procedure.

Measures

The California Structured Decision-Making Model. California's SDM model offers a suite of tools designed to increase safety, permanency, and well-being among child welfare-referred households by guiding hotline, investigation, and reunification assessment procedures (NCCD, 2015). At each decision point, workers complete an SDM form that uses an actuarial

process to guide the course of action (e.g., whether to investigate or screen out an incoming hotline referral, whether or not to open a case). Psychometric literature on the SDM is limited to the safety and risk assessments which, as described above, evaluate immediate threats to child safety and risk of future threats to child safety, respectively. The SDM risk assessment has demonstrated good predictive validity with respect to 6- and 24-month maltreatment recurrence rates, and safety and risk assessment findings are highly correlated (Johnson, 2004). Scholars found that use of the SDM model in Michigan child welfare agencies was associated with fewer substantiations, placements, and re-referrals, as well as higher rates of service provision when cases were opened (Baird et al., 1995). The SDM model is used in all 58 California counties, more than 30 states nationally, and is also implemented internationally in Canada, Taiwan, and Singapore (CDSS, n.d.).

SDM Safety Assessment. If, based on initial hotline screening, a worker determines that a maltreatment referral should be investigated, the SDM safety assessment is completed in order to evaluate immediate threats to child safety in the home. Workers assess five indicators of child vulnerability, 13 safety threats (displayed in Figure 1.2), 10 protective factors, and 10 safety interventions, all of which are dichotomous (0=no, 1=yes). The worker uses this inventory to determine the child's safety in the home: (1) "safe" (absence of any safety threats, the child is safe in the home), (2) "safe with plan" (safety threats are present, but a plan is in place to keep the child safe in the home), or (3) "unsafe" (safety threats are present, and no plan can be put in place to keep the child safe in the home). We dichotomized safety decision (0=safe/safe with plan, 1=unsafe) because the analytic objective was to identify safety threats that account for increased risk of unsafe determinations, not to identify safety threats that are mitigated by the presence of a safety plan. Chapter 2 addresses this question of mitigation by examining which protective factors are present in households that receive a "safe with plan" versus an "unsafe" determination.

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1. Caregiver caused serious physical harm to the child or made a plausible threat to cause serious physical harm in the current investigation, as indicated by:
    a. Serious injury or abuse to the child other than accidental.
    b. Caregiver fears he/she will maltreat the child.
    c. Threat to cause harm or retaliate against the child.
    d. Excessive discipline or physical force.
    e. Drug-exposed infant.
2. Current circumstances, combined with information that the caregiver has or may have previously maltreated a child in his/her care, suggest that the child's safety may be of immediate concern based on the severity of the previous maltreatment or the caregiver's response to the previous incident.
3. Child sexual abuse is suspected, and circumstances suggest that the child's safety may be of immediate concern.
4. Caregiver fails to protect the child from serious harm or threatened harm by others. This may include physical abuse, sexual abuse, or neglect.
5. Caregiver's explanation for the injury to the child is questionable or inconsistent with the type of injury, and the nature of the injury suggests that the child's safety may be of immediate concern.

6. The family refuses access to the child, or there is reason to believe that the family is about to flee.
7. Caregiver does not meet the child's immediate needs for supervision, food, clothing, and/or medical or mental health care.
8. The physical living conditions are hazardous and immediately threatening to the health and/or safety of the child.
9. Caregiver's current substance abuse seriously impairs his/her ability to supervise, protect, or care for the child.
10. Domestic violence exists in the home and poses an imminent danger of serious physical and/or emotional harm to the child.
11. Caregiver describes the child in predominantly negative terms or acts toward the child in negative ways that result in the child being a danger to self or others, acting out aggressively, or being severely withdrawn and/or suicidal.
12. Caregiver's emotional stability, developmental status, or cognitive deficiency seriously impairs his/her current ability to supervise, protect, or care for the child.
13. Other (specify)

Figure 1.2. SDM version 2 safety threat inventory.

SDM Risk Assessment. Workers are required to complete the SDM risk assessment if the safety assessment reveals at least one immediate threat to child safety; this assessment evaluates risk of future threats to child safety and determines whether or not to open a case. Workers are recommended, but not required, to fill out the risk assessment in the absence of any immediate safety threats. The SDM risk assessment assesses 12 risk factors for future neglect, 11 risk factors for future abuse, and other risk factors including mental illness and substance abuse. Mental illness is indicated by the presence of one or more of the following: (1) diagnosis by a mental health professional, (2) repeated referral for psychiatric evaluation, or (3) recommended or completed inpatient psychiatric hospitalization (NCCD, 2015, p. 79). Because SDM mental illness criteria are not based on a standard diagnostic inventory, we hereafter use the term mental health problems when referring to this SDM construct.

Substance abuse is indicated by alcohol and/or drug use that interferes with household functioning based on one or more of the following criteria: (1) job troubles, criminal activity, family problems, or inability to protect, supervise, or care for a child, (2) refusal of DUI or breathalyzer test in the past two years, (3) self-report of problems resulting from substance use, (4) current or past substance use treatment, (5) repeated positive urine screens, (6) substance-induced medical problems, or (7) a drug-exposed infant or child with fetal alcohol syndrome (NCCD, 2015, p. 79). For both mental health problems and substance abuse, workers can specify if criteria are met currently (i.e., within 12 months of referral), and/or by history (i.e., prior to 12 months before referral).

Analysis

Mediation. Mediation models estimate the proportion of variance in outcome *y* predicted by exposure *x* that is accounted for by mediator *m*, i.e., the indirect effect of *x* on *y*. Often, the effect of x on y may be explained by more than one *m*; in such multiple mediation scenarios, it is desirable to assess the extent to which each mediator accounts for the effect of *x* on *y* above and beyond the effects of the other mediators. SEM is the preferred method of modeling multiple

mediation because it allows investigators to simultaneously measure joint and individual indirect effects while controlling for mediator covariance (Preacher & Hayes, 2008).

Our analysis examines whether one or more safety threats mediate the effects of mental health problems and substance abuse on safety decision. Because our mediators and outcomes are dichotomous, we measured single and multiple mediation models in R's Lavaan environment using the diagonally-weighted least squares (DWLS) estimator, an appropriate estimator to use when measuring indirect effects involving endogenous variables that are dichotomous (Muthén, 1984; Muthén et al., 1997). Indirect effects in mediation models are often non-normally distributed, so we used non-parametric bootstrapping with 1,000 replications to estimate standard errors.

Exposure Strata. Using the risk assessment's mental health and substance use indicators, we generated three exposure strata: (1) MH, indicating current mental health problems without current substance abuse, (2) CMH, indicating chronic (i.e., current and history of mental health problems) without current substance abuse, and (3) MHSA, indicating co-occurring current mental health problems and substance abuse. For each exposure stratum, the referent group is parents with no current mental health problems or substance abuse.

Confounders. We included potential confounders in our analyses based on theory and prior evidence. Roscoe et al. (2018) found that assessment year was a confounder of the association between exposure and safety decision in that it biased their association toward the null, so we included it as a covariate. We chose to adjust for child age 0-5 because younger children are at increased risk of maltreatment, and the type of threat to child safety differs depending on child age (ACF, 2016). Last, we controlled for race/ethnicity, given evidence of differing rates of mental health problems and substance abuse by race/ethnicity (CBHSQ, 2016), as well as evidence that child welfare decisions and outcomes vary by race/ethnicity (Putnam-Hornstein et al., 2013).

Single Mediator Models. First, we measured single mediator SEMs with safety decision as the outcome variable, and each of the 13 safety threats individually as the mediator. We measured this set of 13 models for each exposure stratum (MH, CMH, and MHSA) separately, and estimated standard errors for all effects using nonparametric bootstrapping (replications=1,000).

Multiple Mediator Models. We selected mediators for inclusion in multiple mediator models based on which single models had significant indirect effects, correcting for multiple testing bias. We compared two methods of multiple testing bias correction: the method described by Benjamini and Hochberg (1995) and the more conservative Bonferroni correction. The methods produced nearly identical lists of significant mediators, though the Benjamini and Hochberg (1995) correction, being less conservative, retained several additional mediators which, due to data sparsity, led to multiple mediator models that did not converge. We therefore used only those mediators identified as significant by the more conservative method; this corresponded to a Bonferroni-corrected p-value of 0.004. Our multiple parallel mediator models for each stratum included all significant mediators simultaneously and allowed them to covary freely. We estimated standard errors for all effects using nonparametric bootstrapping (replications=1,000).

1.3. Results

Descriptive Statistics

Table 1.1 provides sample descriptive statistics. Six percent (n=251) of households involved a parent with MH, 2% (n=91) involved a parent with CMH, and 5% (n=184) involved a

parent with MHSA. In 80% (n=3,242) of households, parents had no current mental health problems and no current substance abuse. Sixty-two percent of parents were referred for only one maltreatment allegation. Physical abuse (46%), general neglect (43%), and emotional abuse (26%) were the most common types overall and among parents with no MH or SA. Among MH, CMH, and MHSA households, general neglect was the most common allegation, followed by physical abuse and emotional abuse At least one child age 0-5 lived in 50% of all households; this proportion was lowest in households with no MH or SA (43%), and highest in MHSA households (85%). In 35% of households, all children were Hispanic, in 24% all children were Black/African American, in 19% all children were Asian, in 16% all children were White, and in the remaining 5% of households all children were Native American, of different races/ethnicities, or missing race/ethnicity.

Table 1.1
Descriptive statistics

Demographic	Overall (n=4,070)	No Mental Health Problems or Substance Abuse (n=3,242)	Current Mental Health Problems Only (n=251)	Chronic Mental Health Problems Only (n=91)	Current Mental Health Problems and Substance Abuse (n=184)
Allegation					
Physical abuse	46	53	28	21	13
General neglect	43	37	53	63	74
Emotional abuse	26	26	35	34	24
Sibling abuse	17	20	8	7	4
Absent/incapacitated	9	7	22	20	18
Sexual abuse	6	7	3	4	2
Severe neglect	2	2	3	4	4
Exploitation	< 1	< 1	0	0	0
Number of allegations					
1	62	63	54	51	57
2-4	37	36	46	48	42
5-9	0	0	0	1	1
10 or more	< 1	< 1	0	0	0
Disposition					
Unfounded	70	77	58	54	30
Substantiated	32	23	54	58	87
Inconclusive	16	16	20	26	11
Erroneous	3	3	1	1	0
Child ethnicity/race					
Hispanic	35	36	31	30	28
Black	24	23	24	23	30
Asian	19	21	18	13	4

White	16	13	22	27	36
Mixed	1	1	2	2	1
Missing	4	5	3	4	1
Child vulnerabilities					
Child age 0-5	50	43	70	71	85
Medical or mental disorder	4	3	7	10	7
Diminished mental capacity	2	2	3	4	7
School age but not attending	2	2	2	4	1
Diminished physical capacity	1	< 1	2	2	6

Note. Percentages may not sum to 100% due to multiple selection option.

Safety Threats. Among the 35% of households (n=1,420) with at least one safety threat, the mean number of threats was 1.68 (*sd*=1.13). At least one safety threat was documented in 43% of households with any general neglect allegations, 39% of households with any emotional abuse allegations, and 25% of households with any physical abuse allegations.

Figure 1.3 displays the percent of households presenting each safety threat, by exposure. Domestic Violence (10%), Physical Harm (8%), and Failure to Meet Immediate Needs (8%) were the three most frequently documented threats in households overall. Among households with a parent experiencing MH, the three most frequently documented threats were Impaired Caregiving due to Emot/Dev/Cog Problem (39%), Failure to Meet Immediate Needs (12%), and Domestic Violence (10%). For households with a parent experiencing CMH, the top three threats were Impaired Caregiving due to Emot/Dev/Cog Problem (47%), Failure to Meet Immediate Needs (16%), and Other (11%). Among households with a parent experiencing MHSA, the top three were Impaired Caregiving due to Substance Abuse (55%), Impaired Caregiving due to Emot/Dev/Cog Problem (34%), and Physical Harm (32%).

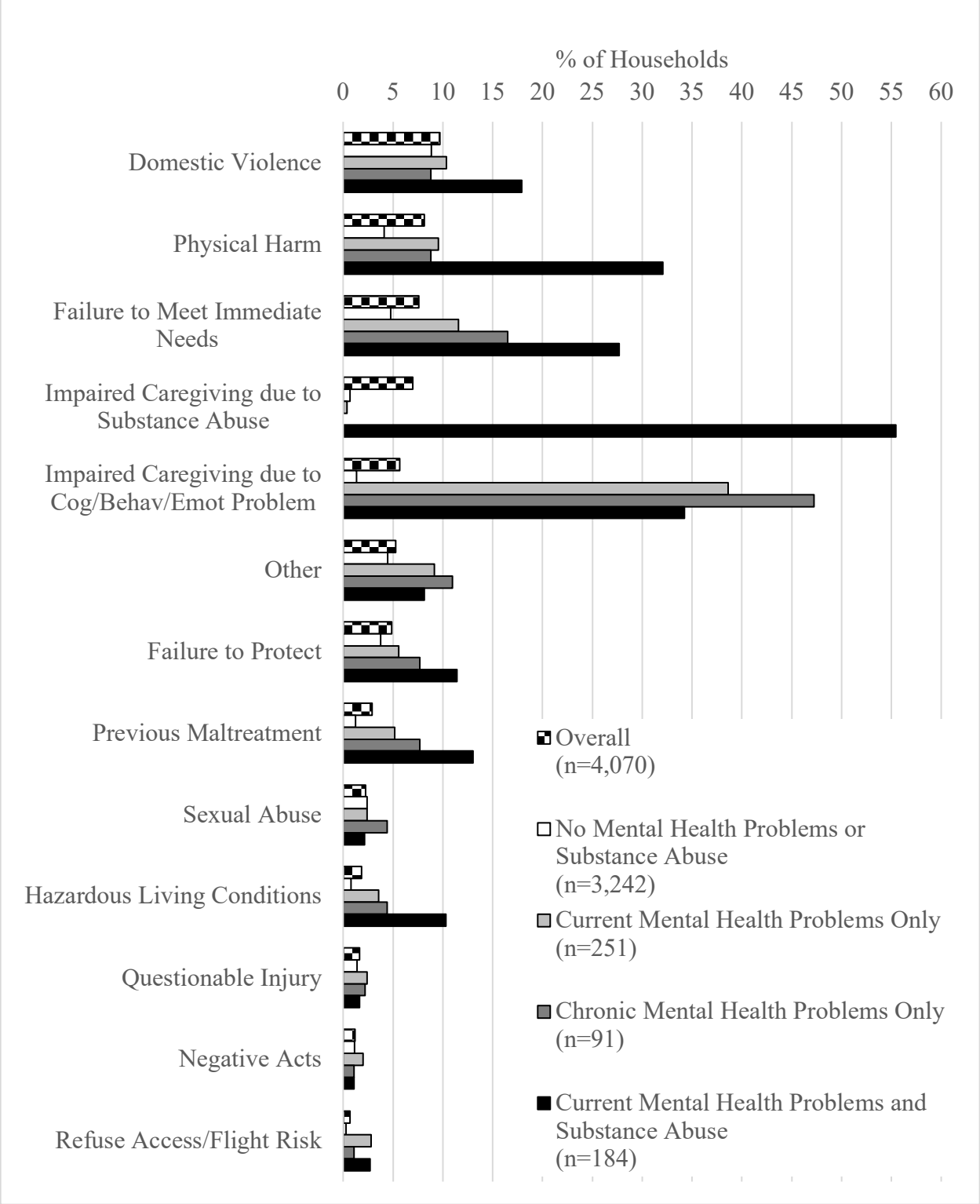

Figure 1.3. Percent of households presenting safety threats.

Safety Decision. Figure 1.4 displays the percent of households in which children were determined unsafe, by exposure. Overall, 11% of all households received an unsafe

determination. This proportion more than doubled among households with a parent experiencing MH (24%), and nearly tripled among households with a parent experiencing CMH (35%). In half of all households in which a parent had MHSA, children were determined unsafe.

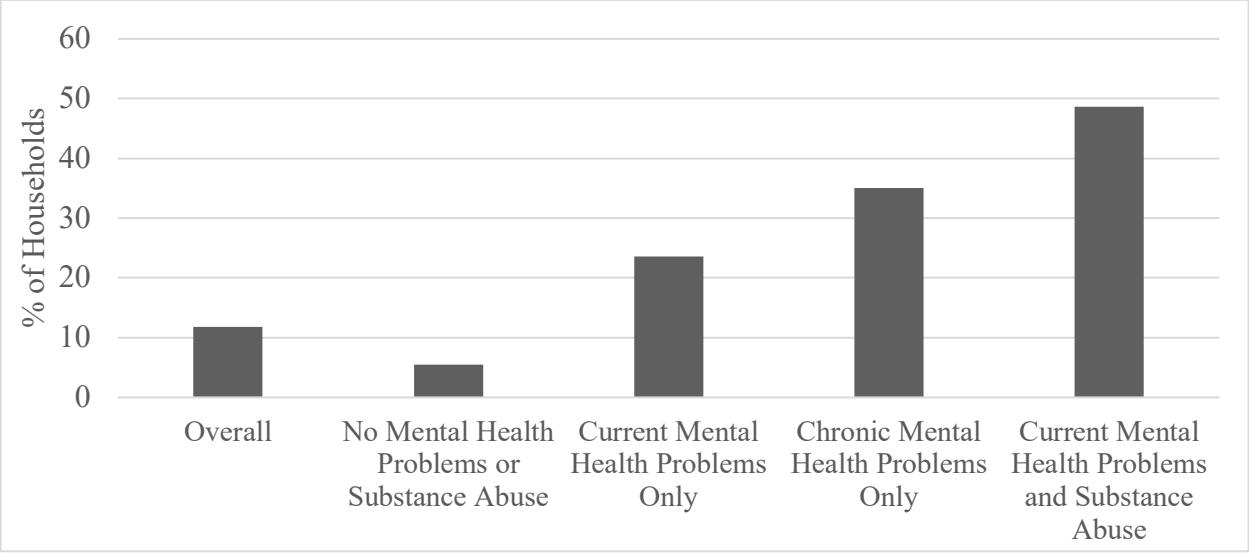

Figure 1.4. Percent of households with children determined unsafe in home.

Single Mediator Models

In the MH single mediator models, the indirect effects of four models reached the Bonferroni-corrected significance threshold of $p \leq 0.004$. In order of largest to smallest indirect effect, these were: Impaired Caregiving due to Emot/Dev/Cog Problem (*OR*=2.72), Previous Maltreatment (*OR*=1.39), Failure to Meet Immediate Needs (*OR*=1.34), and Other (*OR*=1.22). Three indirect effects were significant in the CMH single mediator models: Impaired Caregiving due to Emot/Dev/Cog Problem (*OR*=3.46), Failure to Meet Immediate Needs (*OR*=1.69), and Other (*OR*=1.33). In the MHSA single mediator models, the indirect effects of seven models were significant: Impaired Caregiving due to Substance Abuse (*OR*=2.68), Impaired Caregiving due to Emot/Dev/Cog Problem (*OR*=2.37), Failure to Meet Immediate Needs (*OR*=1.97), Physical Harm (*OR*=1.75), Previous Maltreatment (*OR*=1.63), Hazardous Living Conditions (*OR*=1.48), and Failure to Protect (*OR*=1.41). Complete results of the single mediator model analysis are displayed in Table 1.2.

Table 1.2

Single mediator models: Percent of total effect mediated by each safety threat, by exposure

	Mental Health Problems			Chronic Mental Health Problems			Mental Health Problems and Substance Abuse		
Effect	OR	99.6% CI	% Total	OR	99.6% CI	% Total	OR	99.6% CI	% Total
Harm/Threat of Harm									
Indirect	1.18	(0.97, 1.44)	20%	1.20	(0.86, 1.68)	15%	1.75*	(1.39, 2.21)	38%
Direct	1.92*	(1.40, 2.65)	80%	2.75*	(1.63, 4.64)	85%	2.48*	(1.71, 3.60)	62%
Total	2.27*	(1.70, 3.04)	100%	3.30*	(2.13, 5.13)	100%	4.34*	(3.12, 6.05)	100%
Previous Maltreatment									
Indirect	1.39*	(1.05, 1.84)	40%	1.64	(0.80, 3.38)	41%	1.63*	(1.26, 2.10)	33%
Direct	1.64*	(1.12, 2.39)	60%	2.01	(0.91, 4.46)	59%	2.67*	(1.78, 4.01)	67%
Total	2.27*	(1.68, 3.07)	100%	3.30*	(2.11, 5.16)	100%	4.34*	(3.11, 6.07)	100%
Sexual Abuse									
Indirect	0.95	(0.64, 1.40)	-7%	1.07	(0.55, 2.10)	6%	0.93	(0.41, 2.09)	-5%
Direct	2.40*	(1.46, 3.95)	107%	3.08*	(1.38, 6.86)	94%	4.67*	(1.96, 11.15)	105%
Total	2.27*	(1.68, 3.07)	100%	3.30*	(2.12, 5.15)	100%	4.34*	(3.13, 6.03)	100%
Fail to Protect									
Indirect	1.10	(0.84, 1.42)	11%	1.26	(0.75, 2.11)	19%	1.41*	(1.05, 1.88)	23%
Direct	2.07*	(1.45, 2.95)	89%	2.62*	(1.41, 4.89)	81%	3.09*	(2.08, 4.58)	77%
Total	2.27*	(1.70, 3.03)	100%	3.30*	(2.11, 5.16)	100%	4.34*	(3.13, 6.03)	100%
Questionable Injury									
Indirect	1.07	(0.63, 1.80)	8%	1.06	(0.09, 12.40)	5%	0.94	(0.23, 3.77)	-4%
Direct	2.13*	(1.22, 3.74)	92%	3.11	(0.28, 34.96)	95%	4.63*	(1.11, 19.31)	104%
Total	2.27*	(1.69, 3.05)	100%	3.30*	(2.14, 5.10)	100%	4.34*	(3.08, 6.14)	100%

Refuse Access/Flight Risk									
Indirect	1.39	(0.95, 2.02)	40%	†	†	†	1.31	(0.48, 3.55)	18%
Direct	1.64*	(1.04, 2.58)	60%	†	†	†	3.33*	(1.18, 9.36)	82%
Total	2.27*	(1.69, 3.05)	100%	†	†	†	4.34*	(3.08, 6.12)	100%
Failure to Meet Immediate Needs									
Indirect	1.34*	(1.03, 1.76)	36%	1.69*	(1.12, 2.56)	44%	1.97*	(1.48, 2.61)	46%
Direct	1.69*	(1.23, 2.33)	64%	1.95*	(1.27, 3.00)	56%	2.21*	(1.57, 3.11)	54%
Total	2.27*	(1.68, 3.08)	100%	3.30*	(2.14, 5.10)	100%	4.34*	(3.12, 6.05)	100%
Hazardous Living Conditions									
Indirect	1.23	(0.94, 1.62)	26%	1.31	(0.39, 4.37)	23%	1.48*	(1.07, 2.04)	27%
Direct	1.84*	(1.28, 2.65)	74%	2.52	(0.75, 8.52)	77%	2.94*	(1.93, 4.47)	73%
Total	2.27*	(1.70, 3.04)	100%	3.30*	(2.16, 5.06)	100%	4.34*	(3.15, 6.00)	100%
Impaired Caregiving due to Substance Abuse									
Indirect	0.86	(0.09, 8.11)	-19%	0.32	(0.04, 2.50)	-94%	2.68*	(1.62, 4.43)	67%
Direct	2.65	(0.28, 25.33)	119%	10.21*	(1.30, 80.01)	194%	1.62	(0.89, 2.97)	33%
Total	2.27*	(1.70, 3.04)	100%	3.30*	(2.13, 5.12)	100%	4.34*	(3.04, 6.21)	100%
Domestic Violence									
Indirect	0.99	(0.95, 1.04)	-1%	0.97	(0.88, 1.08)	-2%	1.00	(0.97, 1.04)	0%
Direct	2.29*	(1.70, 3.08)	101%	3.39*	(2.18, 5.27)	102%	4.33*	(3.14, 5.98)	100%
Total	2.27*	(1.69, 3.05)	100%	3.30*	(2.14, 5.10)	100%	4.34*	(3.16, 5.98)	100%
Negative Acts									
Indirect	1.15	(0.56, 2.36)	17%	1.01	(0.04, 24.82)	1%	1.07	(0.13, 8.54)	4%
Direct	1.98	(0.91, 4.31)	83%	3.27	(0.14, 77.41)	99%	4.07	(0.50, 32.85)	96%

Total	2.27*	(1.70, 3.03)	100%	3.30*	(2.11, 5.16)	100%	4.34*	(3.13, 6.03)	100%
Impaired Caregiving due to Cognitive/Behavioral/Emotional Problem									
Indirect	2.72*	(1.97, 3.76)	122%	3.46*	(2.17, 5.52)	104%	2.37*	(1.68, 3.33)	59%
Direct	0.83	(0.56, 1.25)	-22%	0.95	(0.54, 1.68)	-4%	1.84*	(1.17, 2.88)	41%
Total	2.27*	(1.70, 3.03)	100%	3.30*	(2.10, 5.21)	100%	4.34*	(3.12, 6.05)	100%
Other									
Indirect	1.22*	(1.02, 1.45)	24%	1.33*	(1.00, 1.77)	24%	1.20	(0.98, 1.48)	13%
Direct	1.87*	(1.36, 2.56)	76%	2.49*	(1.51, 4.11)	76%	3.61*	(2.50, 5.22)	87%
Total	2.27*	(1.71, 3.02)	100%	3.30*	(2.11, 5.16)	100%	4.34*	(3.14, 6.02)	100%

Notes. Referent group is parents with no mental health problems or substance abuse; bootstrapped standard errors (reps=1,000); % of total effect may exceed 100% within each exposure stratum due to correlation among mediators.
* $p \leq 0.004$ (Bonferroni-corrected p-value)

Multiple Mediator Models

Results of multiple mediator models are displayed in Table 1.3. For ease of presentation we do not provide estimates of mediator covariances in the SEM diagrams (Figures 1.5-1.7). Instead, Table 1.4 displays the polychoric correlation matrix of the safety threats.

Table 1.3

Multiple mediator models: Break-down of indirect effect into significant mediators, by exposure

Effect	OR	95% CI	% Total
Current Mental Health Problems			
Direct	1.03	(0.73, 1.45)	4%
Total Indirect	2.21***	(1.56, 3.12)	96%
Impaired Caregiving due to Cog/Behav/Emot Problem	1.36†	(0.96, 1.95)	38%
Failure to Meet Immediate Needs	1.24**	(1.07, 1.43)	26%
Previous Maltreatment	1.22**	(1.05, 1.41)	24%
Other	1.07†	(0.99, 1.17)	9%
Total	2.27***	(1.87, 2.76)	100%
Chronic Mental Health Problems			
Direct	1.17	(0.77, 1.80)	13%
Total Indirect	2.81***	(1.85, 4.27)	87%
Impaired Caregiving due to Cog/Behav/Emot Problem	1.56*	(1.03, 2.38)	37%
Failure to Meet Immediate Needs	1.52***	(1.19, 1.93)	35%
Other	1.19*	(1.03, 1.37)	14%
Total	3.30***	(2.49, 4.39)	100%
Current Mental Health Problems & Substance Abuse			
Direct	1.10	(0.63, 1.92)	6%
Total Indirect	3.96***	(2.31, 6.81)	94%
Failure to Meet Immediate Needs	1.68***	(1.38, 2.06)	35%
Physical Harm	1.42**	(1.10, 1.84)	24%
Impaired Caregiving due to Substance Abuse	1.34	(0.75, 2.40)	20%
Failure to Protect	1.08	(0.95, 1.23)	6%
Hazardous Living Conditions	1.07	(0.82, 1.39)	5%
Previous Maltreatment	1.06	(0.81, 1.40)	4%
Total	4.34***	(3.47, 5.44)	100%

Notes. Bootstrapped standard errors (reps=1,000); effect break-down many not sum to total effect due to rounding; referent group is parents with no mental health problems or substance abuse

* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$

Table 1.4

Polychoric correlation matrix of SDM Safety Assessment safety threats

Safety threat	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Physical Harm	1												
2. Previous Maltreatment	0.57	1											
3. Sexual Abuse	-0.09	0.21	1										
4. Failure to Protect	0.36	0.39	0.52	1									
5. Questionable Injury	0.50	0.19	0.12	0.49	1								
6. Refuses Access/Flight Risk	0.17	0.46	0.41	0.37	0.12	1							
7. Failure to Meet Immediate Needs	0.27	0.34	0.09	0.46	0.19	0.46	1						
8. Hazardous Conditions	0.33	0.21	0.11	0.43	0.32	0.54	0.60	1					
9. Impaired Caregiving due to Substance Use	0.59	0.51	-0.05	0.43	0.20	0.30	0.53	0.55	1				
10. Domestic Violence	0.03	0.07	0.00	0.41	0.07	0.08	0.07	0.15	0.22	1			
11. Negative Acts	0.31	0.41	0.19	0.45	0.36	0.17	0.25	0.14	0.04	0.06	1		
12. Impaired Caregiving due to Cog/Behav/Emot Problem	0.36	0.36	0.06	0.35	0.10	0.48	0.47	0.44	0.50	0.21	0.25	1	
13. Other	0.09	0.16	0.01	0.22	0.18	0.35	0.24	0.19	0.08	-0.04	0.29	0.27	1

Note. SDM Safety Assessment version 2.

Current Mental Health Problems. In the MH multiple mediator model (Figure 1.5 and Table 1.3), MH more than doubled the odds of an unsafe determination (*OR*=2.27, $p \leq 0.001$) and 96% of this effect was accounted for by the total indirect effect of the four included mediators (*OR*=2.21, $p \leq 0.001$). However, only two of the four individual indirect effects were significant after accounting for their covariance and adjusting for confounders. These were: Failure to Meet Immediate Needs (*OR*=1.24, $p \leq 0.01$), and Previous Maltreatment (*OR*=1.22, $p \leq 0.01$). The indirect effects of Impaired Caregiving due to Emot/Dev/Cog Problem (*OR*=1.36, $p \leq 0.10$) and Other (*OR*=1.07, $p \leq 0.10$) were marginally significant.

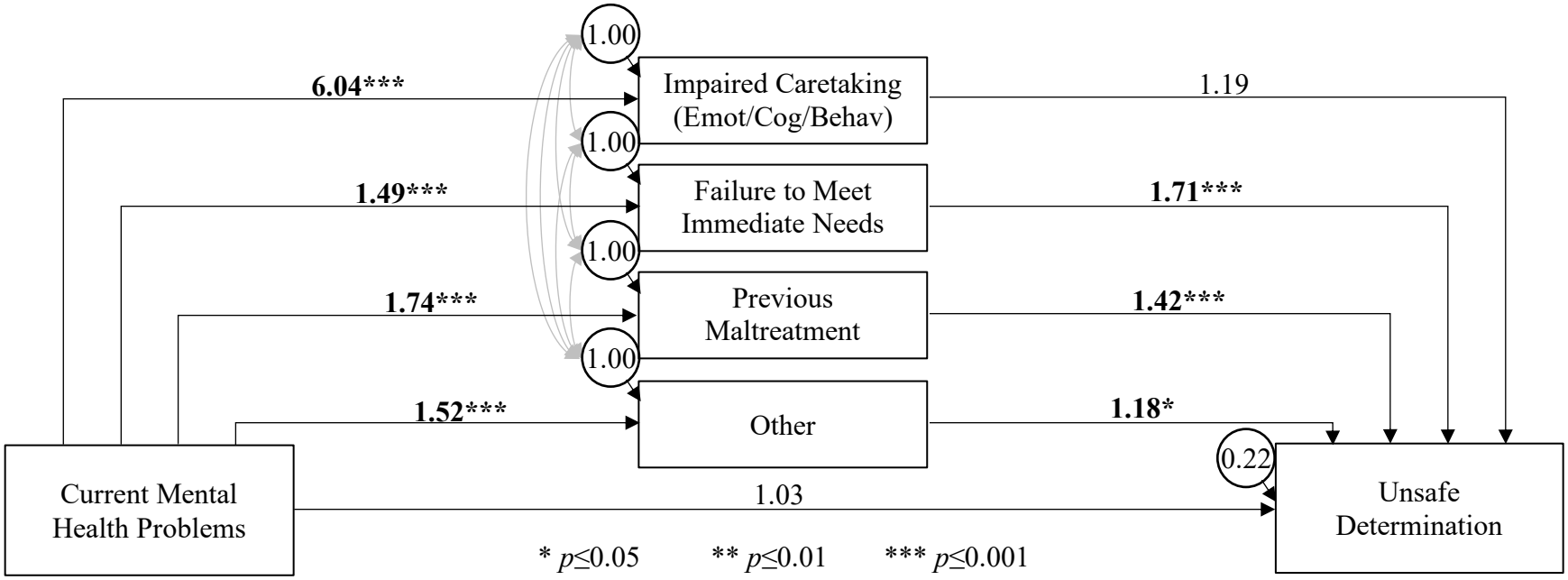

Figure 1.5. Multiple parallel mediator model: Current mental health problems.

Chronic Mental Health Problems. In the CMH multiple mediator model (Figure 1.6 and Table 1.3), CMH more than tripled the odds of an unsafe determination (*OR*=3.30, $p \leq 0.001$) and 87% of this effect was accounted for by the total indirect effect of the three included mediators (*OR*=2.81, $p \leq 0.001$): Impaired Caregiving due to Emot/Dev/Cog Problem (*OR*=1.56, $p \leq 0.05$), Failure to Meet Immediate Needs (*OR*=1.52, $p \leq 0.001$), and Other (*OR*=1.19, $p \leq 0.05$).

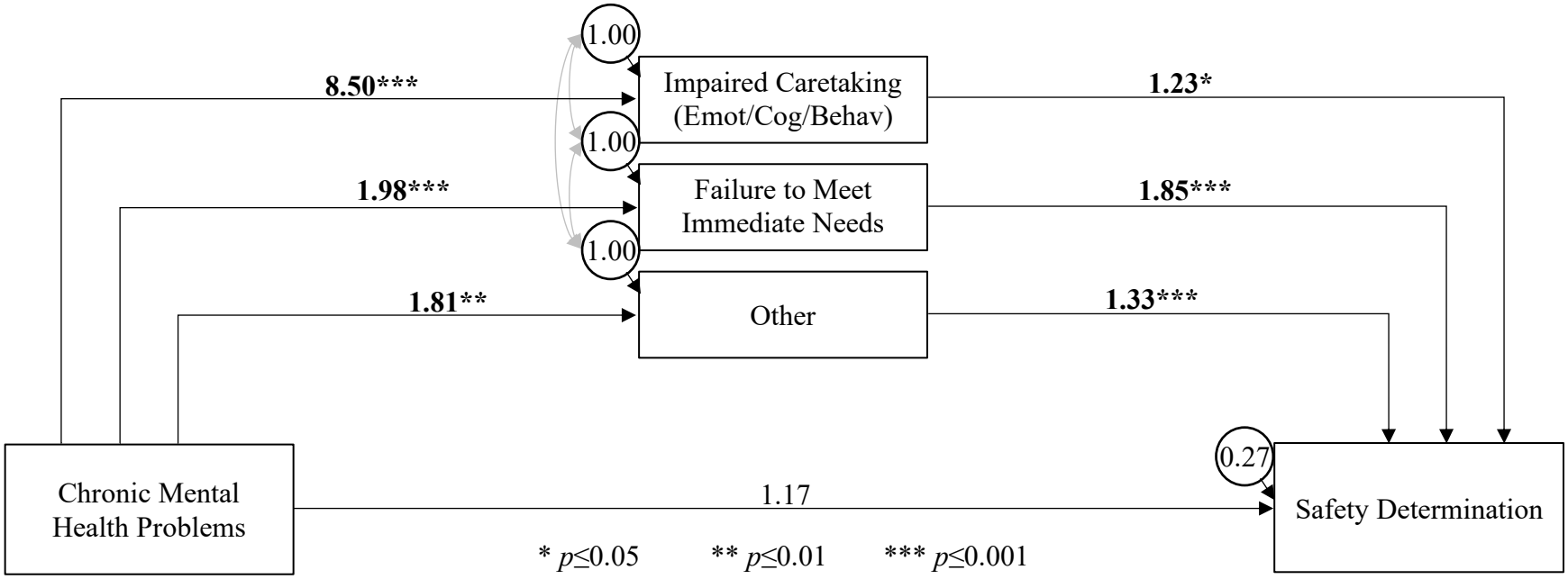

Figure 1.6. Multiple parallel mediator model: Chronic mental health problems.

Current Mental Health Problems and Substance Abuse. Initially, the seven significant mediators from single models were included in the MHSA multiple mediator model, but this resulted in model overspecification that inflated standard errors and rendered results uninterpretable. Inflation of standard errors is not uncommon in multiple mediator models, especially when mediator covariance is high. Similar to the previous analysis (Roscoe et al., 2018), the MHSA multiple model was instead constructed by adding each mediator in succession based on the size of the indirect effect measured in the single mediator models. With the addition of Impaired Caregiving due to Emot/Dev/Cog Problem, the model failed to converge; however, the model was stable when the other six significant mediators were included simultaneously. A possible explanation for these results is that due to its high correlation other mediators, Impaired Caregiving due to Emot/Dev/Cog Problem is not a significant mediator once the indirect effects of the other six mediators are accounted for. (Recall that Impaired Caregiving due to Emot/Dev/Cog Problem was significant in the MH single mediator model, but not significant in the MH multiple mediator model.)

In the final MHSA multiple mediator model (Figure 1.7 and Table 1.3), MHSA quadrupled the odds of an unsafe determination (OR=4.34, $p\leq$0.001) and 94% of this effect was accounted for by the total indirect effect of the six included mediators (OR=3.96, $p\leq$0.001). Two of eight individual indirect effects were significant: Failure to Meet Immediate Needs (OR=1.68, $p\leq$0.001), and Physical Harm (OR=1.42, $p\leq$0.01).

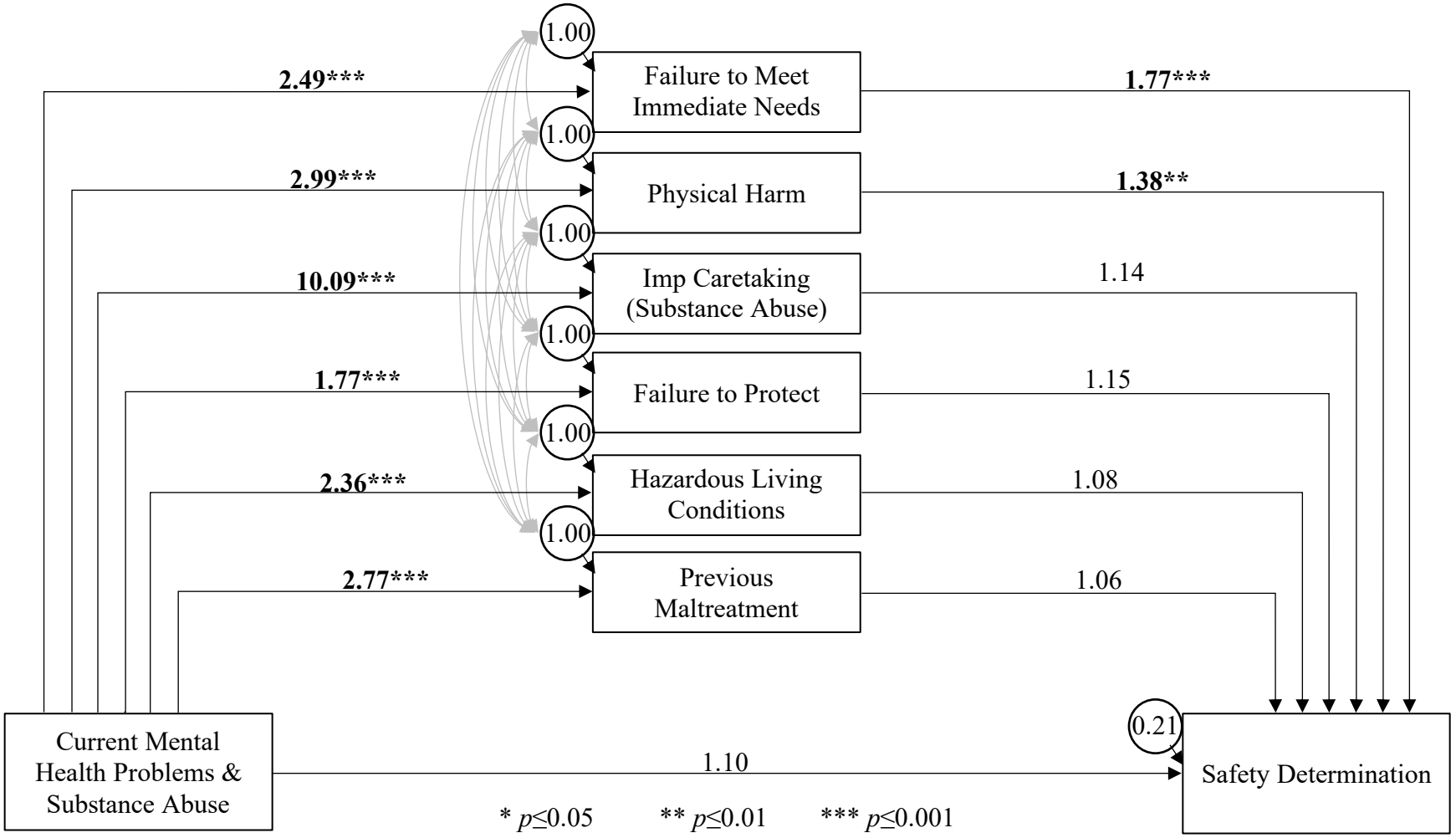

Figure 1.7. Multiple parallel mediator model: Current mental health problems and substance abuse.

Recall from Figure 1.2 that the Physical Harm safety threat is further divided into five sub-threats, meaning that for each Physical Harm indication, there is at least one corresponding sub-threat indication. We examined (among MHSA parents) how Physical Harm indications (n=59) were distributed among the five sub-threats (see Table 1.5). Drug-Exposed Infant was most often indicated (93%), with Excessive Discipline (7%) and Serious Injury (<1%) sparingly indicated, and the remaining two sub-threats (Caregiver Fears He/She Will Maltreat and Threats of Harm/Retaliation) never indicated. Workers may indicate Drug-Exposed Infant when there is evidence of drug use during pregnancy *and* evidence of immediate danger to the infant's health as a result of prenatal exposure, such as medical fragility. In sum, when workers checked off the overall Physical Harm threat for parents with MHSA, they were almost always indicating danger to the infant's health resulting from prenatal exposure to drugs.

Table 1.5
Parents with current mental health problems and substance abuse: Distribution of Physical Harm indications among five sub-threats

Sub-threat	%
Serious Injury	< 1
Caregiver Fears He/She Will Maltreatment	0
Threats of Harm	0
Excessive Discipline	7
Drug-Exposed Infant	93

Note. percentages may not sum to 100% due to rounding.

Analysis of Other Safety Threat

Other was indicated as a safety threat for 215 of the 4,070 households in our sample and was a significant mediator in the MH single mediator model and the CMH single and multiple mediator models. A worker may indicate Other in the case of a safety threat not covered by any of the twelve standard threats, supplemented with a fill-in description. Of the 214 fill-in descriptions in our sample (one instance of Other did not have a description,) 192 described one threat, 20 described two threats and two described three threats, for a total of 238 distinct threat descriptions.

To understand what workers meant when they indicated Other, we read each fill-in response and developed a list of 14 categories, accompanied by examples, that summarized common themes across the 238 threats descriptions (see Table 1.6). We included an additional category ("No Category") for descriptions that did not clearly fit into any of the other 14 categories (n=34). For example, in one household with no MH or SA, a worker indicated "Father was found with child pornography"; though this is not documentable as sexual abuse, the worker wished to flag this discovery as a threat to child safety.

Table 1.6

Other safety threat fill-in descriptions: Categories, definitions, and examples

Category	Definition	Example
Child Behavior	Child refused to return home or is reported to have emotional or behavioral problems	"Minor has issues with school truancy, and has participated in vandalism acts at school. Parents are having difficulty managing his behavior."
Child Welfare History	Prior child welfare history	"parents failed to reunify with 2 children in common; last child was detained at birth approx. one year ago."
Domestic Violence	Concerns of previous or current domestic violence	"the father used a knife to threaten the mother and the child witnessed the mother being in fear."
Driving	Parent unsafe driving with child in car	"Drove with child while drunk and caused and accident, run away from the accident."
Housing	Unstable housing	"Mother constantly moves w/minor from shelter to shelter - she is afraid someone will find them and hurt them."
Incapacity	No responsible guardian/parent incapable of providing care to due to incarceration, hospitalization, or death.	"The mother was arrested and the child was placed with the paternal aunt by the police."
Mental Health	Parent has current or previous mental health problems	"Mother is bipolar, not taking her meds and is actively psychotic."
Neglect	Concerns or presence of neglect	"The parents are neglecting the medical needs of their infant child and are being monitored by SW. Case will be opened."
Physical Abuse	Concerns or presence of physical abuse	"The father allegedly hit the children with a belt and belt buckle."
Relinquish	Caregiver unwilling to care for child	"The mother stated in a TDM that she is unwilling to continue caring for the child."
Sexual Abuse	Concerns or presence of sexual abuse	"Alleged perpetrator has sexually abused another minor the past."

Substance Abuse	Parent suspected of previous or current substance abuse	“The child was born with a positive toxicology screen for cocaine and methadone. The mother admitted to using cocaine two days before the baby's birth and heroine, the day before the baby's birth.”
Substances Present	Child in presence of substances, no evidence of parent use	“The child was allegedly asked to help the uncle to sell drugs and count the money.”
No Category	Response does not conform to any category	“Father was found with child pornography.”

Table 1.7 displays the breakdown of fill-in descriptions by category. In the overall sample of descriptions (n=238), the most common categories were Physical Abuse (16%), No Category (14%), and Incapacity (13%). Among descriptions involving households with a parent experiencing MH (n=29), the most common categories were Mental Health (39%), Incapacity (30%), and No Category (e.g., "[the worker] has not be able to interview the parents to ensure the minimal level of care is provided to the children"; 22%). Among descriptions involving households with a parent experiencing CMH (n=13), the most common categories were Mental Health (46%), Incapacity (31%), and Domestic Violence, Child Behavior, and Child Welfare History (8% each). In short, when workers indicated the Other safety threat on assessments involving MH or CMH households, they were generally describing circumstances related to a parent's mental health problems.

Table 1.7
Other safety threat fill-in descriptions: Percent breakdown overall and by exposure

Other Safety Threat	Overall % (n=238)	No Mental Health Problems or Substance Abuse % (n=158)	Current Mental Health Problems Only % (n=29)	Chronic Mental Health Problems Only % (n=13)
Physical Abuse	16	22	0	0
No Category	14	16	22	0
Incapacity	13	6	30	31
Substance Abuse	12	6	0	0
Domestic Violence	12	12	9	8
Child Behavior	11	11	9	8
Neglect	9	10	4	0
Mental Health	8	1	39	46
Housing	6	3	9	0
Relinquish	6	4	0	0
Child Welfare History	4	2	4	8
Substances Present	2	3	0	0
Driving	2	2	0	0
Substance Abuse	2	2	0	0

Many of the categories identified in the qualitative analysis were similar to the safety assessment's standard list of threats. As a sensitivity analysis, we recoded these instances of Other accordingly (e.g., "Other - Physical Abuse" was recoded as the standard threat "Physical Harm") and examined whether Other was still significant in the MH single mediator model and CMH single and multiple mediator models. Table 1.8 shows that Other was no longer significant in single mediator models after recoding.

Table 1.8

Single mediator models with "Other" safety threat recoded: Percent of total effect mediated by each safety threat, by exposure

	Mental Health Problems			Chronic Mental Health Problems		
Effect	OR	99.6% CI	% Total	OR	99.6% CI	% Total
Harm/Threat of Harm						
Indirect	1.16	(0.96, 1.40)	18%	1.19	(0.79, 1.78)	14%
Direct	1.96*	(1.41, 2.73)	82%	2.79*	(1.58, 4.93)	86%
Total	2.27*	(1.68, 3.08)	100%	3.30*	(2.11, 5.18)	100%
Previous Maltreatment						
Indirect	1.40*	(1.05, 1.85)	41%	1.66	(0.92, 2.99)	43%
Direct	1.63*	(1.12, 2.35)	59%	1.99*	(1.00, 3.93)	57%
Total	2.27*	(1.69, 3.05)	100%	3.30*	(2.18, 5.02)	100%
Sexual Abuse						
Indirect	0.94	(0.68, 1.32)	-7%	1.07	(0.42, 2.70)	6%
Direct	2.40*	(1.54, 3.75)	107%	3.09*	(1.08, 8.84)	94%
Total	2.27*	(1.69, 3.06)	100%	3.30*	(2.13, 5.13)	100%
Fail to Protect						
Indirect	1.10	(0.84, 1.43)	11%	1.26	(0.82, 1.93)	19%
Direct	2.07*	(1.45, 2.97)	89%	2.62*	(1.51, 4.56)	81%
Total	2.27*	(1.69, 3.06)	100%	3.30*	(2.17, 5.03)	100%
Questionable Injury						
Indirect	1.07	(0.64, 1.77)	8%	1.06	(0.09, 12.87)	5%
Direct	2.13*	(1.22, 3.72)	92%	3.11	(0.27, 36.29)	95%
Total	2.27*	(1.70, 3.04)	100%	3.30*	(2.15, 5.07)	100%

Refuse Access/Flight Risk						
Indirect	1.39	(0.70, 2.73)	40%	1.14	(0.01, 91.59)	11%
Direct	1.64	(0.80, 3.36)	60%	2.89	(0.04, 224.88)	89%
Total	2.27*	(1.70, 3.03)	100%	3.30*	(2.18, 5.00)	100%
Failure to Meet Immediate Needs						
Indirect	1.34*	(1.03, 1.74)	35%	1.65*	(1.10, 2.47)	42%
Direct	1.70*	(1.24, 2.33)	65%	2.00*	(1.29, 3.11)	58%
Total	2.27*	(1.70, 3.04)	100%	3.30*	(2.12, 5.15)	100%
Hazardous Living Conditions						
Indirect	1.23	(0.92, 1.66)	26%	1.31	(0.47, 3.68)	23%
Direct	1.84*	(1.26, 2.69)	74%	2.52	(0.84, 7.55)	77%
Total	2.27*	(1.70, 3.03)	100%	3.30*	(2.10, 5.21)	100%
Impaired Caregiving due to Substance Abuse						
Indirect	0.88	(0.14, 5.57)	-15%	0.43	(0.07, 2.59)	-70%
Direct	2.58	(0.39, 16.94)	115%	7.67*	(1.25, 47.19)	170%
Total	2.27*	(1.69, 3.05)	100%	3.30*	(2.13, 5.12)	100%
Domestic Violence						
Indirect	1.00	(0.96, 1.03)	-1%	0.98	(0.90, 1.06)	-2%
Direct	2.28*	(1.68, 3.10)	101%	3.38*	(2.16, 5.28)	102%
Total	2.27*	(1.68, 3.08)	100%	3.30*	(2.13, 5.12)	100%
Negative Acts						
Indirect	1.15	(0.51, 2.56)	17%	1.01	(0.04, 24.33)	1%
Direct	1.98	(0.85, 4.62)	83%	3.27	(0.14, 76.97)	99%
Total	2.27*	(1.68, 3.08)	100%	3.30*	(2.14, 5.09)	100%

Impaired Caregiving due to Cognitive/Behavioral/Emotional Problem						
Indirect	2.79*	(2.00, 3.90)	125%	3.44*	(2.07, 5.71)	103%
Direct	0.81	(0.55, 1.22)	-25%	0.96	(0.53, 1.73)	-3%
Total	2.27*	(1.70, 3.03)	100%	3.30*	(2.13, 5.12)	100%
Other						
Indirect	1.15	(0.94, 1.40)	17%	1.07	(0.13, 8.91)	5%
Direct	1.98*	(1.40, 2.81)	83%	3.10	(0.34, 28.06)	95%
Total	2.27*	(1.70, 3.04)	100%	3.30*	(2.13, 5.12)	100%

Notes. Referent group is parents with no mental health problems or substance abuse; bootstrapped standard errors (reps=1,000); % of total effect may exceed 100% within each exposure stratum due to correlation among mediators

* $p \leq 0.004$ (Bonferroni-corrected p-value)

1.4. Discussion

We identified safety threats that account for why children of parents with MH, CMH, and MHSA are at increased risk of being determined unsafe in the home. Our models explained most of the total effects of MH (96%), CMH (87%), and MHSA (94%) on the safety decision. We found that children of non-substance using parents with current mental health problems are typically determined unsafe in the home due to unmet immediate needs and previous maltreatment. Children of non-substance using parents with chronic mental health problems are typically determined unsafe in the home due to unmet immediate needs and other safety concerns related to the parent's mental health problems that fell outside of the standard threat categories. Children of parents with co-occurring mental health problems and substance abuse are typically determined unsafe due to unmet immediate needs and infant health problems resulting from prenatal exposure to drugs.

Improvements Over the Previous Study

Our study improved on the analysis performed by Roscoe et al. (2018) in several respects, including addressing the issue of temporal precedence with the addition of the CMH exposure, and implementing a more sophisticated mediation modeling protocol using SEM. Consistent with the literature (e.g., Hollingsworth, 2004), parents with CMH experienced odds of unsafe determination that were higher than those of parents with MH. CMH single mediator model results were generally consistent with those of MH, with the exception that the indirect effect of Previous Maltreatment was significant for MH but not for CMH. This result is likely related to the small sample size of CMH households (n=97) compared to MH households (n=251). The Other threat was significant in the multiple mediator model for CMH, but not MH, suggesting that in the case of CMH households, workers were documenting safety concerns related to parental mental health that required a greater level of explication. Overall, our CMH findings supported the argument that the mediation effects we observed were due to mental health problems that preceded maltreatment allegations. However, we recognize that our use of the CMH exposure does not establish true temporal precedence in the manner that longitudinal data would permit.

Using recommended multiple mediation modeling practices, we obtained results that differed from those of the prior study with respect to the mediators that remained significant in our multiple mediation models. Notably, whereas the indirect effect of Impaired Caregiving due to Emot/Dev/Cog Problem retained significance in the stepwise models measured by Roscoe et al. (2018), it was reduced to non-significance in our MH multiple mediator model and could not be included in our MHSA multiple mediator model likely due to multicollinearity. The indirect effect of Impaired Caregiving due to Substance Abuse was also reduced to non-significance in the MHSA multiple mediator model. When all effects and covariances are measured simultaneously, as in the present study, indirect effects attenuated in proportion to the strength of mediator covariance (Preacher & Hayes, 2008). As Table 1.4 indicates, both caregiver impairment threats are moderately correlated with several of the other significant mediators, including Failure to Meet Immediate Needs. The indirect effects of the two caregiving impairment threats may have attenuated in the presence of threats such as Failure to Meet Immediate Needs because caregiving impairment is a rather broad and general safety threat, whereas Failure to Meet Immediate Needs is a specific type of caregiving impairment (or, more precisely, it is the consequence of a caregiving impairment). As such, the latter may account for the total effect above and beyond the former when entered into a multiple mediator model.

We intended to simultaneously measure the indirect effects and covariances of all mediators in each of the three multiple mediator models (MH, CMH, and MHSA). Unfortunately, the MHSA multiple mediator model failed to converge, requiring the use of the stepwise approach employed in the original Roscoe et al. (2018) analysis. The exclusion of only one of seven mediators resolved the non-convergence issue, however, meaning that covariance between mediators was largely accounted for.

Failure to Meet Immediate Needs

Failure to Meet Immediate Needs was a significant mediator in all single and multiple mediator models for all exposures in both the current study and in Roscoe et al. (2018), suggesting that it plays an important role in understanding why children of parents with mental health problems or co-occurring mental health problems and substance abuse are more likely to be determined unsafe. This finding corroborates previous evidence of higher levels of neglect among child welfare-involved parents with mental health problems and substance abuse (Ghertner et al., 2018), and speaks to the preventive value of establishing or re-establishing a household's connection to financial, material, and housing resources at the outset of service delivery. For child welfare providers investigating current maltreatment allegations, such efforts may prevent the recurrence of allegations. For other human service providers, such as mental health workers, timely linkage to financial, material, and housing resources may reduce risk of initial maltreatment referral by addressing an intermediate cause.

However, the importance of this finding does raise the question of whether a parent's failure to meet a child's immediate needs should be taken as evidence of maltreatment instead of evidence that external factors are interfering with the ability of an individual to parent effectively. SDM explains that this threat is to be indicated if a child is in "immediate danger of being seriously harmed" because a caregiver is "unable or unwilling to address critical areas of food, clothing, shelter, supervision, and/or medical and mental health care" (NCCD, 2015, p. 39). An *unwillingness* to address a child's immediate needs, which suggests a deliberate act of negligence on behalf of a parent, is distinct from an *inability* to address those needs, which suggests that a parent lacks capacity. SDM does not distinguish between unwillingness and inability to meet needs, let alone distinguish among types of incapacitation. Given the previously discussed association between Failure to Meet Immediate Needs and the impaired caregiving threats, it is plausible that parents in our sample lacked psychological capacity to meet immediate needs, although financial inability is also a likely contributor due to the economic correlates of mental health problems—especially when those problems are chronic (Mowbray et al., 2001). However, some suggest that in addition to the substance-related psychological problems that affect caregiving, a parents' inability to meet a child's immediate needs may also reflect a preoccupation with obtaining substances (Barth, 2009). Lack of clarity in this decision-making domain could inadvertently contribute to a fundamental attribution error, wherein inability to meet a child's needs is mischaracterized as a willful act of negligence rather than a correlate of socioeconomic deprivation. A science of actuarial child welfare decision-making should help us avert such misattributions.

Physical Harm

Roscoe et al. (2018) found that Threats of Harm/Retaliation, a sub-threat of Physical Harm, was a significant mediator of the effect of MH on safety decision. In the present analysis, Physical Harm did not meet the Bonferroni-corrected significance level in our MH or CMH single mediator models. Physical Harm was significant only in our MHSA models, and in the final MHSA model it accounted for 24% of the total effect. However, most workers indicated

this threat because an infant had health problems associated with prenatal exposure to substances. Although the safety assessment does not document many details of a parent's substance abuse, among them substance type, we should assume that this finding has a place, however circumstantial, in the broader conversation on opioid abuse and maltreatment. The plight of San Francisco's opioid-addicted mothers has been poignantly documented as one in which pregnancy, addiction, and poverty often culminate in custody loss, sometimes even when immediate threats to child safety are unclear (Knight, 2015). As our understanding of the consequences of prenatal exposure to substances deepens, so to should the complexity with which we assess how these exposures in and of themselves constitute evidence that a mother should not maintain custody of her child.

As with Roscoe et al. (2018), the present analysis found no evidence that threats involving bona fide physical abuse accounted for any of the effects of the three exposures on safety decision. This finding appears to be a counterpoint to other studies that have associated parental mental health problems and substance abuse with physical abuse (Chaffin et al., 1996; Walsh et al., 2003), and may help develop discrepancy in the public conscience with respect to mental health stigma and the myth of the mad woman.

Previous Maltreatment

Final models indicated that 24% of the effect of MH on safety decision was accounted for by Previous Maltreatment, an unexpected finding given that the analysis sample consists exclusively of parents referred for the first time for maltreatment allegations in California, and though a small proportion of their children had experienced prior maltreatment referrals, this referral history was controlled for in all analyses. A possible explanation is that workers indicated Previous Maltreatment when parents disclosed a history of child welfare from their childhood or from out-of-state, a phenomenon not captured in our data. Importantly, SDM criteria specify that current and immediate threats to child safety must be present in addition to previous maltreatment in order for workers to check off the Previous Maltreatment threat, thereby ensuring that the assessment of child safety is not based solely on previous circumstances. Indeed, all but one MH household with Previous Maltreatment also had another current safety threat indicated. In sum, when workers determine that children of parents with MH are unsafe, the decision is based in part on the parent's prior history of child welfare involvement, but typically only if another immediate threat to child safety is present.

Other

The Other safety threat was significant in single mediator models for MH and CMH, and 14% of the effect of CMH on safety decision was accounted for by the Other safety threat. When workers indicated Other for MH and CMH households, they were most often describing circumstances related to a parent's mental health problems. As our Mental Health example in Table 1.6 illustrates, some of these observations do not document a specific threat to child safety associated with parental mental health problems; rather, the mental health description itself is documented as evidence. This type of decision-making runs counter to SDM policy, wherein parental mental health problems only play a role in safety decision if the parent—as a *consequence* of mental health problems—acts, or fails to act, in a way that threatens the child's immediate safety.

It is possible that workers use fill-in descriptions to provide context for standard threats that are checked off. For instance, the Mental Health example in Table 1.6 was drawn from an assessment in which the worker also indicated Impaired Caregiving due to Emot/Dev/Cog Problem; by describing the mother's poor mental health status using the Other threat, the worker

may have been clarifying that the impairment in caregiving was due to emotional problems, rather than developmental or cognitive problems. Use of Other in this manner, though not entirely in keeping with SDM policy, may help provide richer context for workers working serving MH and CMH households.

Limitations

Our study improved on key limitations of its predecessor, though several remain. The SDM criteria for mental illness are broad, diagnosis non-specific, and based on self-reported symptoms and mental health service history. Other published studies have used such a generalized mental health indicator, however, and have found similar effects (e.g., Westad & McConnell, 2012). Mental health problems and substance abuse were recorded using the risk assessment, which is administered to households only with at least one safety threat or at the worker's discretion. Thus, ours is a riskier subset of households; we cannot assume our inferences hold for households that did not receive risk assessments.

1.5. Conclusions

In an era of enduring mental health stigma, the layperson is liable to believe the association between parental mental illness and child removal is self-evident. Unfortunately, until recently, scholars have done little to explain the association in terms of specific and observable threats to child safety in the home. We found that child protection workers typically determine children of parents with mental health problems (with or without substance abuse) unsafe due to a narrow range of safety threats. These results may enable more precise attempts at intervening on current maltreatment to prevent more protracted child welfare involvement, as well as maltreatment recurrence.

That most safety decision-making involving parents with mental illness and substance abuse was explained by documented threats to child safety also speaks to the evolution of child welfare decision-making. The modernization of decision-making frameworks has refocused the child welfare provider's role in the lives of parents and children referred for maltreatment. Yesterday's decision-making ethos emphasized the promotion of the child's "best interests" and well-being, and workers' intuition may well have privileged assessments of parents' character over assessments of their behavior. This decision-making system has given way to an actuarial framework that permits protective action only under considerations of severe documentable threats to children's safety. In the absence of safety threats, individuals with mental health problems or substance abuse can continue to parent their children without the oversight of child welfare workers. As child welfare providers work to meet the needs of a growing population of households affected by parental mental health problems and substance abuse, a decision-making system that emphasizes safety assessment over intuitive judgment is critical to ensuring that these households are investigated fairly, without the undue influence of bias or stigma. Hopefully, this evolution in decision-making will over time represent another example of how the field is working to achieve a more judicious balance between an individual's right to parent and the child welfare system's duty to intervene.

Chapter 2

Protective factors and child welfare decisions involving households affected by parental mental health problems and substance abuse

Abstract

Background: Mental health problems and substance abuse among parents investigated for maltreatment increase risk of children being determined unsafe in the home. Fostering growth of protective factors may help prevent more extensive or recurrent child welfare involvement for these households, but few studies have examined protective factors in this context.

Methods: To address this gap, this study applied interaction analysis to a sample of 1,420 Structured Decision Making® assessments administered in San Francisco, CA, from 2007-2015, all of which documented at least one threat to child safety while also assessing for parent and child protective factors. Parents with mental health problems only (MH; 11%), substance abuse only (SA; 20%), and both (MHSA; 11%), were compared to parents with no MH or SA (58%) in terms of the moderating effect of the total number of protective factors on risk of "unsafe" determination, as well as the moderating effects of individual protective factors.

Results: Risk of unsafe determination was 20% in households with no MH or SA, 38% in MH households, 51% in SA households, and 56% in MHSA households. The average number of protective factors was 2.99 (sd=2.84), with a maximum of 10. For every additional protective factor, risk of an "unsafe" determination diminished. Once the total number of protective factors was accounted for, however, the evidence was unclear that any given factor individually reduced the risk of an "unsafe" determination, though some (e.g., caregiver capacity, taking protective action) appeared to have some protective value in and of themselves. Among households with no placements, the twelve-month maltreatment re-referral rate for "safe with plan" households (21%) was non-significantly different than that of "safe" households (19%), suggesting that when protective factors are present, households with at least one safety threat are no more likely to be re-referred than households with no safety threats. The re-referral rate differed significantly by exposure group however; it was lowest among MH households (17%) and highest among MHSA households (40%).

Conclusions: Protective factors mitigate increased risk of child removal among households affected by parental mental health problems and/or substance abuse. Promoting such factors may prevent recurrent child welfare involvement for these vulnerable children.

Keywords: Parents; Mental health; Substance abuse; Child welfare; Protective factors

2.1. Introduction

When child protection workers assess households referred for allegations of maltreatment in California, they must determine whether the child can remain safely in the home both during and after the investigation. To guide this process, workers use the Structured Decision Making® (SDM) System, an actuarial tool with inventories of safety threats, protective factors, and safety interventions (*The Structured Decision Making® System Policy and Procedures Manual*, 2015) that help determine the appropriate course of action with respect to child safety. Documentation of one or more immediate threats to child safety often warrants child removal, an intervention that disrupts family unity and places additional burden on the child welfare system. However, workers often determine that children can remain in the home with a safety plan in place despite immediate safety threats; this determination is based in part on the presence of family protective factors, examples of which include a healthy parent-child relationship or a parent's willingness and ability to use community resources.

Among households referred for allegations of maltreatment, those involving parental mental health problems or substance abuse are at greater risk of workers determining children to be unsafe. Thus, the possibility that family protective factors might mitigate such increased risk is all the more important to these households. Little is known about how family protective factors affect a worker's safety decision in such households, however. If, in the presence of sufficiently robust family protective factors, a worker determines children as safe regardless of parental mental health problems or substance abuse, such a process could suggest that fostering growth of protective factors in these households could prevent more serious or recurrent child welfare involvement.

Using a sample of households in San Francisco County referred for the first time for maltreatment allegations, this study examines how protective factors affect safety decisions involving parents with and without mental health problems and/or substance abuse. Two different protective factor effects are considered: (1) the effect of the total (or cumulative) number of protective factors, and (2) the specific effect of each individual protective factor. The study also examines whether cumulative protective factors affect safety decisions in households with specific threats to child safety drawn from dissertation chapter 1. Lastly, the study examines associations between protective factors and maltreatment recurrence. Findings could be considered in the context of interventions for maltreatment-referred parents with mental health problems or substance abuse, with the overall objective of reducing maltreatment recurrence and improving family and child well-being.

Child Maltreatment and Parent Mental Health

In the United States, nine in 1,000 children are officially documented as victims of substantiated maltreatment (U.S. Department of Health & Human Services et al., 2019), although the underlying rate of maltreatment in the community is undoubtedly higher. Risk of social, emotional, and behavioral problems is high among maltreated children (Lansford et al., 2002) as is risk for educational and occupational problems (Currie & Spatz Widom, 2010). New cases of substantiated maltreatment cost the country $428 billion annually in lifetime expenses (Peterson et al., 2018).

Nearly one in five parents in the United States experiences mental illness at a given point in time (Stambaugh et al., 2017), and risk of maltreatment is between three and seven times higher among children of parents with mental health problems or substance use than in those of parents without (Chaffin et al., 1996; De Bellis et al., 2001). Children of parents with versus without mental health problems are more than twice as likely to be determined unsafe in the

home during investigations due to immediate threats to safety; the risk is nearly tenfold higher if substance abuse co-occurs (Roscoe et al., 2018). Children of parents with mental health problems are also more likely to have substantiated maltreatment allegations, to be placed in care, and to receive ongoing child welfare services (Westad & McConnell, 2012).

In the past, decision-making instruments often considered parental mental health problems and substance use threats to child safety in and of themselves (DePanfilis & Scannapieco, 1994; Pecora, 1991). Now, in most states nationwide—including California—parental mental illness plays a role in decision-making only if it is associated with specific threats to the child's immediate safety. Although literature on parental mental health problems and child welfare decision-making is limited, chapter 1 of this dissertation found that children of parents with mental health problems were at greater risk of being determined unsafe in the home primarily due to three safety threats presented by their parents: an inability to meet children's immediate needs, a previous history of maltreatment, and other nonstandard safety concerns related to parental mental health. Children of parents with co-occurring mental health problems and substance abuse were at greater risk of being determined unsafe primarily because of a parents' inability to meet children's immediate needs, and the adverse health effects of prenatal exposure to substances.

Protective Factors and Child Maltreatment

In addition to evaluating current threats to child safety, decision-making instruments often incorporate assessments of risk and protective factors. A risk factor is typically defined as an attribute or condition that increases the likelihood of a negative outcome (in this case, child removal, maltreatment recurrence, etc.) and a protective factor as an attribute or condition that reduces the effect of a risk factor on the likelihood of that negative outcome. Risk-modification is at the heart of what scholars define as resilience, i.e., a positive outcome despite adversity (Luthar et al., 2000; Masten, 2015; Windle, 2011). Researchers from a variety of disciplines have examined concepts similar to resilience, including scholars of positive youth development (Catalano et al., 2004), applied behavioral analysis (Goldiamond, 1974), and strengths-based social work (Saleebey, 2002). The concept of protection is distinguishable from related concepts such as "strengths," however. A strength is typically defined as an emotional or behavioral competency; by comparison, a protective factor is a personal, family, or community characteristic that is defined by its capacity to mitigate the effect of a specific risk factor or risk factors (Luthar, 1991; Probst, 2009). In other words, a protective factor can be considered a strength "in action."

Researchers interested in resilience have examined protective factors across a range of at-risk populations in order to understand which child characteristics promote positive development outcomes despite adversity. Beginning with a landmark study of Kauaian youth (Werner, 1989) three fundamental protective factor domains have emerged from studies of resilience: personal characteristics (e.g., internal locus of control, high IQ), family and social factors (e.g., warm family relationships, robust social supports), and community factors (e.g., access to quality education; Greenberg et al., 2001). Numerous subsequent studies have linked similar child protective factors to resilience in a range of at-risk populations including exposure to chronic stress (Luthar, 1991; Luthar et al., 1993; Masten et al., 1999; Masten & Tellegen, 2012), parental mental illness (Collishaw, Hammerton, et al., 2016), terrorism (Bonanno et al., 2007; Hobfoll et al., 2009), and maltreatment (Bartlett & Easterbrooks, 2015; Cicchetti et al., 1993; Collishaw, Pickles, et al., 2016, 2016; Dixon et al., 2009; DuMont et al., 2007; Herrenkohl et al., 2005; Jaffee et al., 2007; Schultz et al., 2009), among others.

In the maltreatment literature, researchers have found similar evidence of this triad of protective factors. Resilience to maltreatment has been found to be higher among those with personal characteristics such as high IQ (Jaffee et al., 2007), a more reserved, controlled temperament (Cicchetti et al., 1993), better social and adaptive functioning skills (DuMont et al., 2007), and non-white racial identity (DuMont et al., 2007). Financial solvency appears to protect against intergenerational maltreatment as well (Dixon et al., 2009). Studies of gender and resilience to maltreatment have found evidence of protection among both males and females, depending on age and other study factors (DuMont et al., 2007; Jaffee et al., 2007). Family factors appear to function protectively. The presence of a caring parent (Collishaw, Pickles, et al., 2016), a parent with prosocial beliefs (Herrenkohl et al., 2005), a stable home environment, and supportive life partners have all been associated with resilience in maltreated children (DuMont et al., 2007). Social supports also appear to play an important role in fostering resilience among maltreated individuals (Bartlett & Easterbrooks, 2015; Collishaw, Pickles, et al., 2016; Dixon et al., 2009; Herrenkohl et al., 2005; Li et al., 2011), as do community factors such as religious affiliation and neighborhood safety (Herrenkohl et al., 2005; Jaffee et al., 2007).

Studies of resilience among children of parents with mental health problems or substance use are common (e.g., K. M. Miller et al., 2014; Yan, 2016), though they are less often conducted in the context of child maltreatment. In one of few such studies, investigators found that among families living in a neighborhood with average to high levels of violence, family social supports reduced risk of maltreatment by way of reducing parental depression (Martin et al., 2012). Given the robust literature linking parental mental health problems to increased risk of child maltreatment and worse child welfare outcomes (De Bellis et al., 2001; Hollingsworth, 2004; Park et al., 2006; Westad & McConnell, 2012), more studies are needed that examine how protective factors may mitigate these risks.

Cumulative Models of Protection. The linkage of specific protective factors to resilient outcomes suggests that these factors have individual effects, i.e., a given factor is protective in and of itself. More commonly however, protective factors, like risk factors, tend to affect developmental outcomes in a cumulative manner, such that the number and combination of risk and protective factors—either at a given point in time or across time—are better predictors of outcomes than individual factors alone (Masten & Wright, 1998).

Cumulative models of risk and protection underlie many studies of child risk factors and developmental outcomes. A longitudinal study of violent offending risk among 475 Swedish male children found that risk and protective factors operated cumulatively; each addition childhood risk factor increased risk of violent offense fivefold whereas each additional school-age protective factor decreased risk tenfold (Andershed et al., 2016). A study of aggressive behavior among severely emotionally disturbed youth found that both baseline cumulative protective factors and changes in these factors over time were more predictive of improvements in aggressive behavior than were risk factors, though cumulative protection effects tended to be strongest at the beginning of follow-up (Bowen & Flora, 2002). One study of 2,410 adolescents found that risk and protective factors indices, as well as their interaction, were predictive of problem behaviors (e.g., alcohol and drug use, delinquency) such that the positive association between risk factors and risk of problem behaviors was weaker among adolescents with greater numbers of protective factors (Jessor et al., 1995). Similarly, a study of nearly 2,000 inner-city youth found that cumulative risk and protection indices were both individually and interactively predictive of alcohol use risk (Griffin et al., 2000).

Maltreatment researchers have advanced theories that recognize the pivotal role of cumulative risk (Cicchetti & Lynch, 1993; MacKenzie et al., 2011; Masten & Wright, 1998); indeed, maltreatment risk factor studies have shown that once their cumulative effect has been accounted for, few single risk factors appear to have any individual effects (MacKenzie et al., 2011). Although some have pointed out the importance of examining cumulative protection within the context of these theoretical frameworks, few cumulative protection analyses can be found in the literature (e.g., Collishaw, Hammerton, et al., 2016; Herrenkohl et al., 2005). Researchers tend to examine risk factors cumulatively but protective factors individually. For instance, one study of maltreatment and resilience examined both the individual and cumulative effects of risk factors on the likelihood of antisocial behavior among maltreated and non-maltreated youth, but only examined the individual effects of personal protective factors such as IQ and sex (Jaffee et al., 2007). Few have examined the cumulative effect of such factors, let alone tested whether individual effects persist after the cumulative effect is taken into account.

The Present Study

In San Francisco County, when a worker documents threats to child safety in a household referred for maltreatment, the worker determines whether the child can remain in the home during and after the maltreatment investigation based in part on an assessment of family protective factors. If a worker decides that protective factors mitigate threats to child safety, the worker may allow a child to remain in the home with a safety plan. Whether such protective processes are conditional on parental mental health and substance use status, however, is unknown. For instance, a worker might worry that in the presence of parental mental health problems, a strong parent-child relationship (a protective factor) might actually be indicative of enmeshment; the worker may therefore be less likely to conclude that the relationship is protective.

This study is among the first to examine how protective factors affect child protection decision making in the context of parental mental health problems and/or substance use. The study examines the effects of cumulative and individual protective factors on the association between safety threats and safety decision, and test whether these effects depend on parental mental health and substance use. The study also tests whether cumulative protective factors mitigate the effects of the subset of safety threats identified in chapter 1 of this dissertation. Finally, to assess the durability of protective factors, we examine the risk of maltreatment re-referral among households in which children were permitted to remain at home with a safety plan, and test whether risk depends on the number of protective factors, mental health status, or substance abuse status.

2.2. Methods

Study Context

We examine protective processes in the context of child maltreatment referrals and investigations conducted by San Francisco's public child welfare agency, Family and Children's Services (FCS). FCS uses the Structured Decision Making® (SDM) System (NCCD, 2015) to guide decisions regarding child maltreatment screening, assessment, and in- and out-of-home services. Roughly half of San Francisco County's maltreatment referrals are screened in for investigation by FCS hotline workers each year. Referrals are characterized as high, moderate, or low risk; high risk referrals must be attended to within 24 hours (i.e., "immediate response"); moderate to low risk within 10 days (i.e., "10-day response"). In both cases, workers are required to investigate referrals using the SDM safety assessment tool, which evaluates current threats to child safety, protective factors, and safety interventions. When at least one threat to child safety

is documented on the safety assessment, workers have 30 days to complete the SDM risk assessment, which assesses the likelihood of future threats to child safety and helps determine whether an ongoing case should be opened (NCCD, 2015). Absent any safety threats, SDM recommends (though does not mandate) that workers complete the risk assessment.

Sample

Our focus is on early assessment and intervention for child welfare-involved households affected by parental mental health problems; thus we limited our sample to households in which parents had no history of FCS involvement in California. We also limited our sample to households that received both safety and risk assessments, given that the former assesses safety threats and protective factors, and the latter assesses mental health and substance use. The majority of FCS's maltreatment investigations used Version 2 of the SDM safety assessment, which was first implemented at the beginning of 2007 and replaced near the end of 2015 with Version 3. Because of substantial differences between versions, we included in our sample only those households investigated using Version 2.

Figure 2.1 shows that of the 44,566 unique referrals made during the study window (01/01/2007-10/31/2015), 38,836 alleged abuse at the hands of a mother and/or father, and 16,163 were first-time referrals for the parent(s). Of these first-time referrals, 7,269 were screened in and received a safety assessment and 4,261 received both safety and risk assessments. Most (n=3,580) had safety assessments performed within 10 days of referral and risk assessments performed within 30 days of safety assessment, per San Francisco policy, and an additional 681 households received "late" safety assessments performed 11-30 days after referral. Regarding these late assessments, FCS explained that workers were required to transfer assessments completed in the field to an electronic record, causing a delay. Furthermore, at the outset of SDM implementation in 2007, staff were less familiar with the new paperwork and practices, often requiring more time to complete documentation. We decided to include these late assessments in the final sample to increase statistical power and to make inferences more generalizable to households investigated by FCS. Table A1 shows that the safety assessment's timeliness had minimal effect on the association between mental health/substance abuse status and safety decision, and thus did not meet criteria as a confounder per Jewell (2004). The final sample consisted of 4,072 matched safety and risk assessments. Two of these were excluded from analyses because mental health and substance abuse information was missing. Thirty-five percent (n=1,420) of safety assessments received required risk assessments related to documentation of at least one safety threat (mean safety threats=1.69, *sd*=1.13). The remaining 65% (n=2,650) received recommended risk assessments at the worker's discretion. Because a household must have at least one documented safety threat in order for workers to complete the protective factors inventory the subset of households with required risk assessments comprised the final analysis sample (n=1,420).

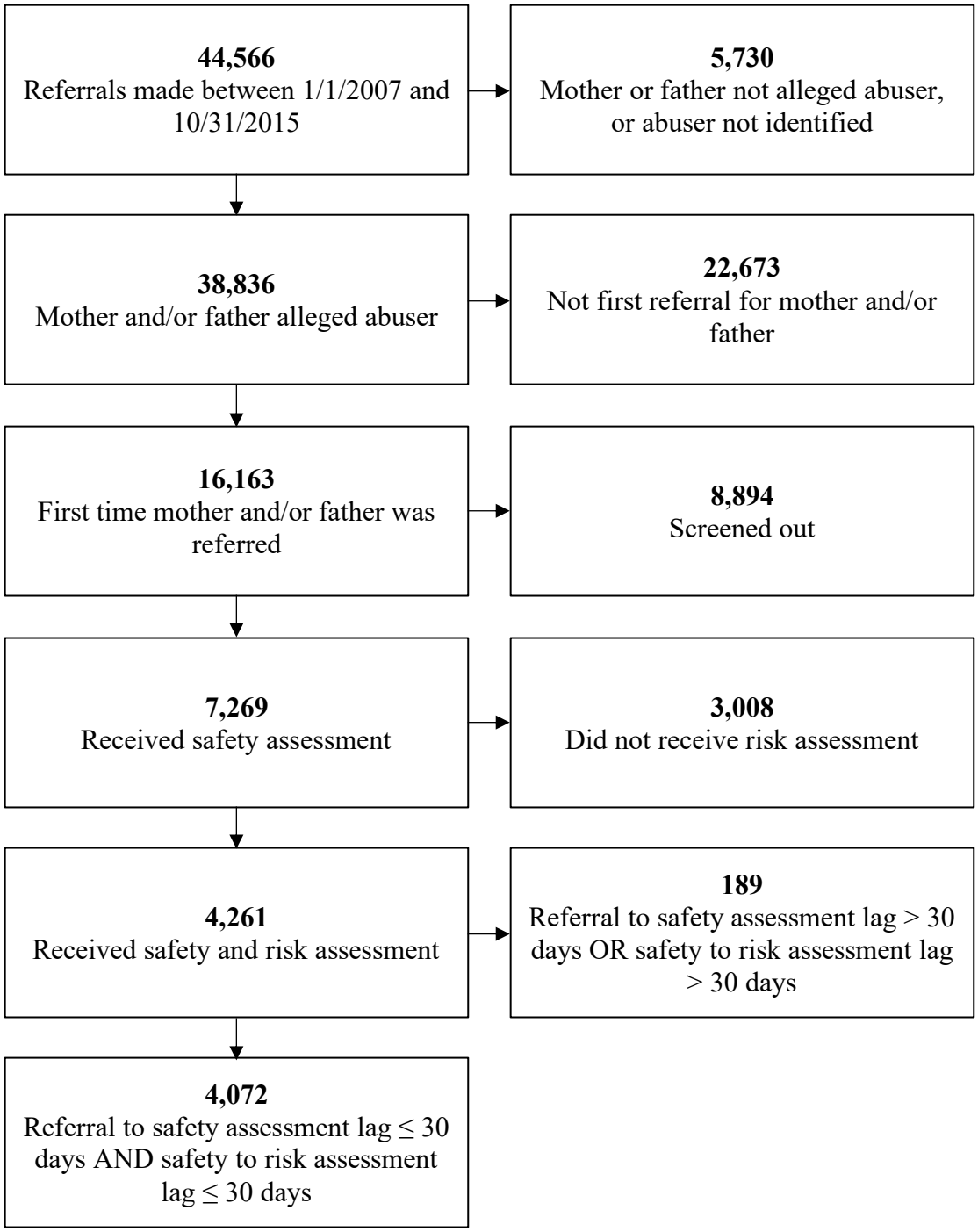

Figure 2.1. Data merge and sample selection procedure.

Measures

The California Structured Decision-Making Model. The California SDM model guides decision-making at each juncture in the maltreatment referral process, including screening, investigation, placement, and reunification assessment procedures (NCCD, 2015). In each instance, workers complete an SDM form to determine next steps (e.g., whether or not to investigate a new referral, whether or not to remove a child from the home). Although the

psychometric literature is limited, the SDM risk assessment demonstrated good predictive validity in a study of 6- and 24-month maltreatment recurrence rates, and the study found a high correlation between the safety and risk assessment (Johnson, 2004). A Michigan study of nearly 2,000 families piloted SDM in 13 counties and compared child welfare outcomes over a 12-month follow-up period to matched counties that were implementing treatment as usual (Baird et al., 1995). The study found that compared to treatment as usual, use of SDM tools was associated with fewer substantiations, placements, and re-referrals, and higher service provision rates among clients with open cases. The SDM model is widely used both nationally and internationally (CDSS, n.d.).

SDM Safety Assessment. Workers complete the SDM safety assessment when investigating referrals screened in by hotline workers, to determine if the child can remain safely in the home during the investigation. The worker assesses the household for the presence of a number of empirically based indicators associated with child safety, including five child vulnerability factors and 13 safety threats, all dichotomously indicated (0=No, 1=Yes). If no threats are present, the worker is required to determine the child safe in the home. If one or more safety threats are observed, the worker must decide between two determinations: safe with plan or unsafe. To assist in making this determination, the worker is required to take an inventory of 11 empirically based protective factors (see Figure 2.2), all dichotomously indicated (0=No, 1=Yes). If the worker determines that a safety plan can adequately mitigate threats to child safety, the worker assesses for the feasibility of eight safety interventions, all dichotomously indicated (0=No, 1=Yes), and both the protective factors and safety interventions inventories are leveraged as the worker and family generate the safety plan. If the worker determines that the child cannot remain in the home with a safety plan in place, the child is determined unsafe.

Consistent with prior research and theory (Masten & Wright, 1998), the analysis examined both the cumulative and individual effects of protective factors on risk of unsafe determination. Cumulative effects were examined by deriving a score for each household equal to the total number of protective factors documented on the safety assessment. Scores ranged from 0 to 10 (no worker documented evidence of all 11 protective factors for any given household).

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1. Child has the cognitive, physical, and emotional capacity to participate in safety interventions (*Child Capacity*).
2. Caregiver has the cognitive, physical, and emotional capacity to participate in safety interventions (*Caregiver Capacity*).
3. Caregiver has a willingness to recognize problems and threats placing the child in imminent danger (*Recognizes Problems*).
4. Caregiver has the ability to access resources to provide necessary safety interventions (*Accesses Resources*).
5. Caregiver has supportive relationships with one or more persons who may be willing to participate in safety planning, AND caregiver is willing and able to accept their assistance (*Supportive Relationships*).
6. At least one caregiver in the home is willing and able to take action to protect the child, including asking offending caregiver to leave (*Protective Action*).
7. Caregiver is willing to accept temporary interventions offered by worker and/or other community agencies, including cooperation with continuing investigation/assessment (*Accepts Intervention*).

8. There is evidence of a healthy relationship between caregiver and child (*Healthy Parent-Child Relationship*).
9. Caregiver is aware of and committed to meeting the needs of the child (*committed*).
10. Caregiver has history of effective problem solving (*History of Problem-Solving*).
11. Other

Figure 2.2. SDM version 2 protective factors inventory.

SDM Risk Assessment. SDM requires workers to complete the risk assessment if at least one threat to child safety is identified on the safety assessment (although SDM recommends that workers complete the risk assessment even if no safety threats are recorded). Workers use the risk assessment to evaluate risk of future child safety threats, and to determine if a case should be opened. The assessment evaluates 12 neglect risk factors and 11 abuse risk factors, including mental illness and substance abuse. SDM characterizes mental illness based on the presence of: (1) diagnosis by a mental health professional, (2) repeated referral for psychiatric evaluation, or (3) recommended or completed inpatient psychiatric hospitalization. Workers specify if mental illness criteria are met currently (i.e., within 12 months of referral), and/or by history (i.e., prior to 12 months before referral; NCCD, 2015, p. 79). We hereafter use the term "mental health problems" when referring to this SDM construct, because SDM mental illness criteria are not intended to replace a standard psychiatric assessment that would determine if symptoms meet a diagnostic threshold.

Workers check the substance use indicator in the case of alcohol and/or drug use that interferes with household functioning, as demonstrated by: (1) employment or family problems, legal troubles, or inability to protect, supervise, or care for a child, (2) DUI or refusal to accept breathalyzer test within two years, (3) self-reported substance use problems, (4) substance use treatment (current or historic), (5) repeated positive urine screens, (6) medical problems caused by substance use, or (7) a drug-exposed infant or child with fetal alcohol syndrome (NCCD, 2015, p. 79). Workers specify if substance abuse criteria are met currently (i.e., within 12 months of referral), and/or by history (i.e., prior to 12 months before referral). We divided parents into three exposure groups: (1) current mental health problems only (MH), (2) current substance abuse only (SA), and (3) current co-occurring mental health problems and substance abuse, and derived three exposure dummy variables (one for each exposure group), with the reference group being parents without current MH or SA.

Covariates. As in chapter 1 of this dissertation, we controlled for assessment year, race/ethnicity, and presence of a child age 0-5.

Analysis

Safety Threat Strata. We expected that the risk of unsafe determination would increase in proportion to the cumulative number of safety threats present in the household, and that the mitigating effect of protective factors on the risk of an unsafe determination would be weaker in higher threat households; because of this, we divided the sample into two strata. The first stratum represented households with only one safety threat; 62% (n=883) of households fell into this stratum. The second represented households with two or more safety threats (n=537). Only 18% of households in the first stratum were determined unsafe, compared to 55% of households in the second stratum. We designated the former "lower threat" and the latter "higher threat." We chose only two strata because further stratification by number of safety threats resulted in overly small sample sizes. Each analysis considered the overall sample, as well as both strata individually. We did not include a stratum for households with no safety threats because the outcome does not

vary for these households (i.e., they are required to receive a safe determination), and logistic regression cannot compute odds ratios involving groups for which the outcome is invariant.

Cumulative Protective Factors Analysis. Using logistic regression, we examined whether the effect of the cumulative protective factors on safety decision depended on exposure group (MH, SA, and MHSA). We regressed safety decision on cumulative protective factors, the exposure dummy variables, and the interaction between cumulative protective factors and exposure, adjusting for covariates as specified. The interaction term functions as an overall test of whether the effect of cumulative protective factors depends on exposure group. We estimated this model using the overall sample and both the high risk and low risk strata individually.

Using parameter estimates from each of these models, we then estimated the marginal effect of each exposure on safety decision for each number of protective factors (0-10), with covariates fixed at their means. The marginal effect estimates the absolute difference in probability of an unsafe determination between exposure and comparison households at a given value of protective factors and as a function of all model covariates. We plotted the estimated probability of an unsafe determination for each exposure at each number of protective factors and indicated when the marginal effect of each exposure was significant at that value. For a given number of protective factors, a significant positive marginal effect estimate indicates that having the exposure is associated with a probability of unsafe determination that is higher than that of comparison households, a non-significant marginal effect estimate indicates that having the exposure is associated with a probability of unsafe determination that is no different than that of comparison households, and a significant negative marginal effect estimate indicates that having the exposure is associated with a probability of unsafe determination that is lower than that of comparison households. The latter two scenarios can be interpreted as evidence of protection.

Individual Protective Factors Analysis. For each protective factor individually, we examined whether the effect of that factor on safety decision depended on exposure. We regressed safety decision on the protective factor, the exposure dummy variables, and the interaction between cumulative protective factors and exposure, for a total of 11 models. In addition to adjusting for covariates as specified in the cumulative effects analysis, each model also adjusted for the total number of protective factors, similar to the methodology described by MacKenzie, et al. (2011); this was done to determine whether any individual protective factors were predictive above and beyond the cumulative factors index. A Bonferroni-corrected p-value was applied to adjust for multiple testing ($p \leq 0.005$).

Using parameter estimates from each of the 11 models, we then estimated the marginal effect of each protective factor on safety decision for the three exposures. We plotted the estimated probability of an unsafe determination for each protective factor-exposure combination and indicated when the marginal effect of each exposure was significant, for a total of eleven marginal probability plots. When a marginal effect estimate is significant and positive in the absence of a protective factor (i.e., risk is higher in the exposed group) and the marginal effect estimate is either non-significant or significant and negative in the presence of that factor (i.e., risk is equal between exposed and unexposed groups, or lower in the exposure group), this can be interpreted as evidence of protection.

Threat-Specific Protection Analysis

Chapter 1of this dissertation identified a profile of safety threats that accounted for most of the association of MH and MHSA with safety decision. In the case of MH, two threats (Unmet Immediate Needs and Previous Maltreatment) were significant mediators of this association.

Two threats (Unmet Immediate Needs and Physical Harm) were significant mediators in the case of MHSA. In this analysis, we used logistic regression to test whether cumulative protective factors mitigated the risk of an unsafe determination among MH and MHSA households in which these safety threats were observed. (We did not examine individual protective factors due to the volume of testing this would involve.)

For the MH exposure group, we examined each of the two threats (Unmet Immediate Needs, Previous Maltreatment) individually by comparing the odds of unsafe determination in MH households with the threat to the odds of unsafe determination in MH households without the threat, and we tested if this odds ratio depended on cumulative number of protective factors. If a positive and significant odds ratio (i.e., risk is higher in the exposed group) becomes non-significantly different from 1 as the cumulative number of protective factors increases (i.e., risk is the same in exposed and unexposed groups), this can be interpreted as evidence of protection that is specific to MH households with that threat.

In the case of MHSA, we performed the same analysis for each of the two threats individually (Unmet Immediate Needs and Physical Harm). Each logistic regression model controlled for cumulative number of safety threats, assessment year, race/ethnicity, and presence of a child age 0-5.

Using parameter estimates from each model, we then estimated marginal effects for each number of protective factors with covariates fixed at their means, as in the cumulative protective factors analysis. We plotted the estimated probability of an unsafe determination for each comparison group at each number of protective factors and indicated when the marginal effect was significant. As before, for a given number of protective factors, a significant positive marginal effect estimate indicates that having the exposure is associated with a probability of unsafe determination that is higher than that of comparison households, a non-significant marginal effect estimate indicates that having the exposure is associated with a probability of unsafe determination that is no different than that of comparison households, and a significant negative marginal effect estimate indicates that having the exposure is associated with a probability of unsafe determination that is lower than that of comparison households. The latter two scenarios can be interpreted as evidence of protection.

Re-Referral Analysis

If a worker determines a child is safe in the home, maltreatment re-referral within twelve months is typically considered evidence of ongoing risk in the home that either escalated or was undetected the first time; this is especially true if re-referral allegations are substantiated. Similarly, if a worker determines a child is safe with a plan in part because protective factors were seen to mitigate safety threats, maltreatment re-referral within twelve months could be considered evidence that these protective processes were not sustained over time or were insufficiently robust to overcome the risks. To assess durability of protective processes, we examined risk of re-referral in twelve months by parental mental health and substance use status among households that received “safe with plan” determinations and tested whether risk depended on cumulative number of protective factors. A dichotomous outcome variable was derived to indicate if any parent in the household was re-referred between 31 and 365 days following the initial referral. Based on other re-referral analyses (Eastman et al., 2016; Kim et al., 2020; Putnam-Hornstein et al., 2015), we limited the re-referral sample to households with no placed children, given that parents are not at risk of re-referral if children are not in the home.

Using logistic regression, we regressed the two re-referral indicators (re-referral within twelve months and substantiated re-referral within twelve months) individually on cumulative

protective factors, the exposure dummy variables, and the interaction between cumulative protective factors and exposure, controlling for covariates as specified.

2.3. Results

Descriptive Statistics

As a subset of the overall sample (n=4,070), the analysis sample comprised all households with one or more safety threats (n=1,420). Eleven percent of these households had a parent with MH, 20% had a parent with SA, and 11% had a parent with MHSA; in the remaining 58% of households, parents had neither MH nor SA (see Table 2.1). By race/ethnicity, the largest proportion of households involved Hispanic children (36%), followed by Black (26%), White (18%), and Asian children (15%); the remaining 5% of households involved children of mixed or missing race/ethnicity. Most households (66%) involved at least one child age 0-5. The most common maltreatment allegations were general neglect (52%), physical abuse (32%), and emotional abuse (30%). Overall, households had a mean of 1.69 safety threats (*sd*=1.13), and households with MH, SA, and MHSA had increasingly higher mean numbers of safety threats relative to comparison households.

Table 2.1
Descriptive statistics

	Total households (n=1,420)	No mental health problems or substance abuse (n=822)	Mental health problems only (n=158)	Substance abuse only (n=277)	Mental health problems and substance abuse (n=163)
Race/Ethnicity (%)					
Hispanic	36	40	28	35	27
Black	26	25	23	28	31
White	18	10	23	28	36
Asian	15	18	21	6	4
Mixed	2	2	2	2	1
Missing	3	3	3	1	1
Child referral history	13	17	8	6	6
Child age 0-5 (%)	66	54	76	84	86
Allegations (%)					
General neglect	52	40	54	75	75
Physical abuse	32	44	27	13	11
Emotional abuse	30	34	34	21	22
Caregiver absence/ incapacitation	16	13	25	16	19
Sibling abuse	14	20	9	5	4
Sexual abuse	7	10	3	1	2
Substantial risk	4	4	2	5	2
Severe neglect	4	2	5	5	4
Exploitation	< 1	< 1	0	0	0
Total safety threats mean(sd), median	1.69(1.13), 1	1.39(0.84), 1	1.64(0.97), 1	2.12(1.34), 2	2.46(1.52), 2
Total protective factors mean(sd), median	2.99(2.84), 2	3.62(2.94), 3	2.34(2.55), 1	2.18(2.43), 1	1.85(2.45), 1

Protective Factors. The mean number of protective factors was 2.99 (*sd*=2.8), the median was 2, and the maximum was 10. Figure 2.3 shows that the three most common protective factors overall were Caregiver Capacity (41%), Recognizes Problems (39%), and Accesses Resources (38%). Among parents with no MH or SA, the same three factors were the most common (53%, 47%, and 45%, respectively). In MH households, the most common were Supportive Relationships (32%), Accepts Intervention (30%), and Accesses Resources (29%). For SA households, the most common were Accepts Intervention (34%), Recognizes Problems (33%), and Caregiver Capacity and Supportive Relationships (both 31%). In MHSA households, the most common were Accepts Intervention and Supportive Relationships (both 29%), Caregiver Capacity and Recognizes Problems (23%), and Accesses Resources (21%).

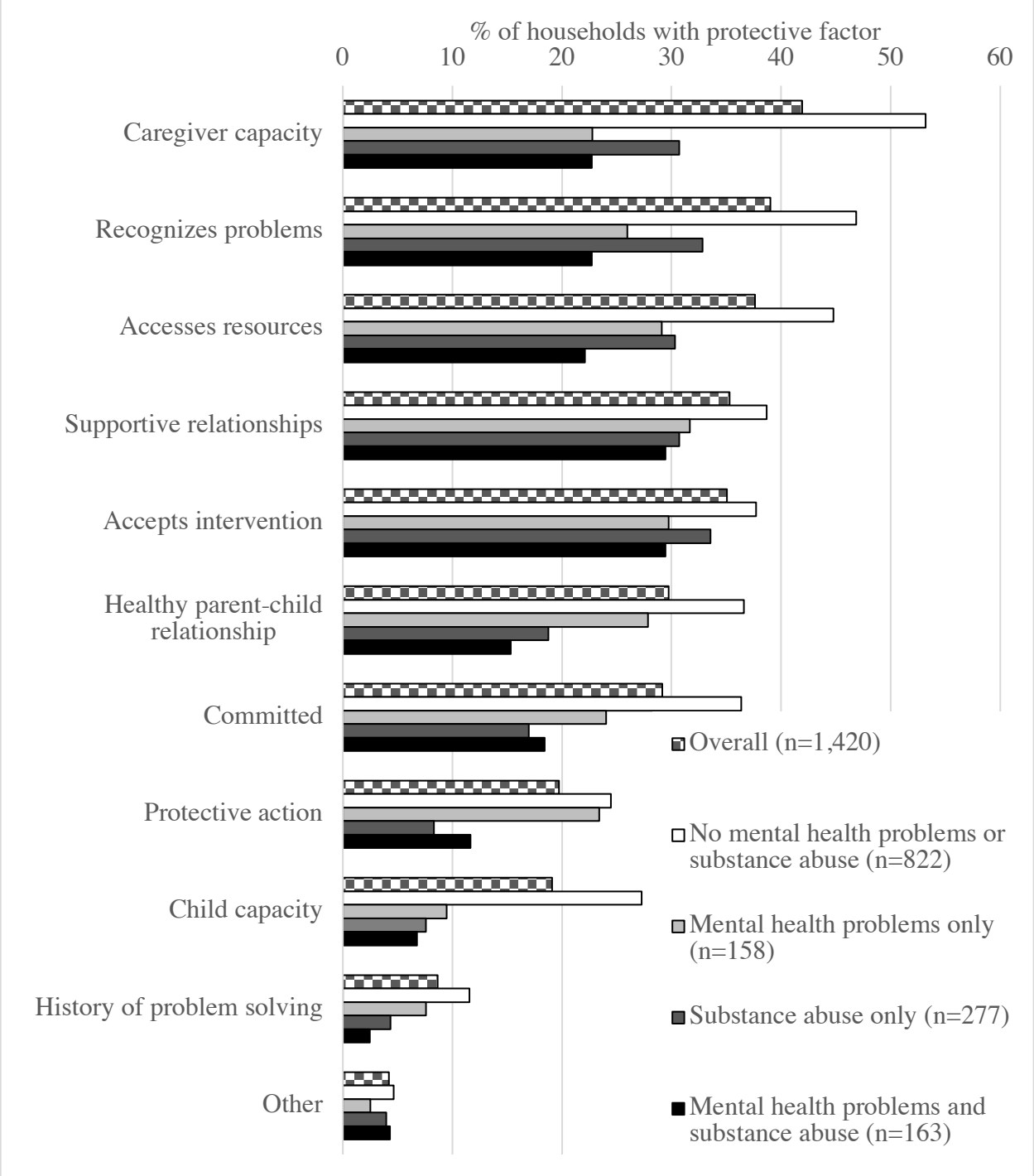

Figure 2.3. Percent of households with each protective factor.

Safety Decisions. Thirty-two percent of all households received unsafe determinations. Unsafe determinations were least common among households with no MH or SA (20%) and most common among MHSA households (56%). SA households (51%) were determined unsafe more often than MH households (39%). Generally, with each additional protective factor, the percent of households determined unsafe decreased overall and for each exposure (see Figure 2.4).

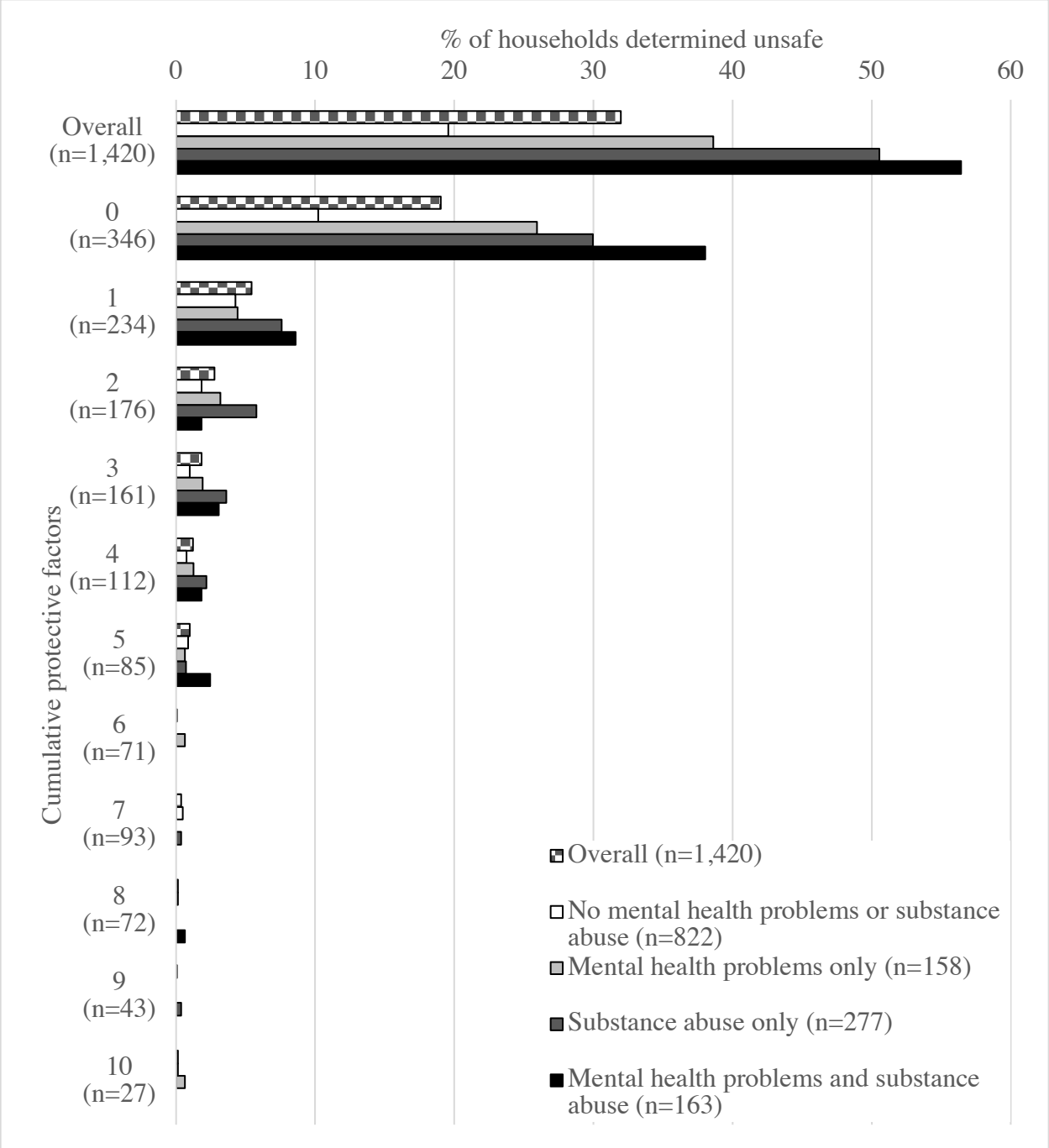

Figure 2.4. Percent of households determined unsafe, by number of protective factors.

Cumulative Protective Factors Analysis

Overall Sample. Table 2.2 shows that among households with no protective factors, the odds of unsafe determination nearly doubled in MH households (*OR*=1.71, $p \leq 0.10$) and nearly quadrupled in SA (*OR*=3.53, $p \leq 0.001$) and MHSA households (*OR*=3.34, $p \leq 0.001$). In households with no MH or SA, the odds of an unsafe determination halved for every additional

protective factor (*OR*=0.54, $p \leq 0.001$). The non-significant interaction terms suggest that the effect of number of protective factors on safety decision did not depend on exposure.

Table 2.2

Effect of cumulative protective factors on association between parental mental health problems/substance abuse and safety decision

	Households with ≥ 1 Safety Threat (n=1,420)		Households with 1 Safety Threat (n=883)		Households with ≥ 2 Safety Threats (n=537)	
	OR	95% CI	OR	95% CI	OR	95% CI
Cumulative protective factors	0.54***	(0.48, 0.61)	0.37***	(0.29, 0.48)	0.68***	(0.59, 0.78)
Exposure						
MH	1.71†	(0.97, 3.01)	1.12	(0.50, 2.49)	1.40	(0.56, 3.54)
SA	3.53***	(2.14, 5.82)	1.86	(0.84, 4.14)	2.84**	(1.34, 6.03)
MHSA	3.34***	(1.90, 5.89)	1.88	(0.78, 4.56)	2.47*	(1.07, 5.74)
Exposure-protective factor interaction						
MH	1.08	(0.83, 1.41)	1.85***	(1.29, 2.67)	0.71	(0.44, 1.15)
SA	0.96	(0.77, 1.18)	1.45†	(0.97, 2.15)	0.75*	(0.57, 0.97)
MHSA	1.08	(0.85, 1.37)	1.49	(0.91, 2.46)	0.85	(0.64, 1.13)
Assessment year	0.95†	(0.89, 1.00)	0.94	(0.86, 1.02)	0.92†	(0.85, 1.01)
Child referral history	0.58*	(0.37, 0.92)	0.62	(0.30, 1.28)	0.39**	(0.21, 0.75)
Child ages 0-5	0.64**	(0.46, 0.88)	0.44***	(0.27, 0.70)	0.91	(0.56, 1.47)
Race						
White	1.08	(0.72, 1.63)	1.05	(0.56, 1.98)	0.92	(0.50, 1.72)
Hispanic	0.83	(0.59, 1.18)	1.02	(0.61, 1.72)	0.53*	(0.31, 0.90)
Asian	0.76	(0.48, 1.20)	1.01	(0.53, 1.91)	0.52†	(0.24, 1.12)
Mixed	1.86	(0.63, 5.48)	0.68	(0.06, 8.01)	1.75	(0.43, 7.01)
Intercept	2.01**	(1.28, 3.15)	2.02*	(1.06, 3.82)	4.95***	(2.26, 10.86)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for race dummy variables is Black

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$
*** $p \leq 0.001$

Marginal effect estimates displayed in Figure 2.5 suggest that unsafe determinations were more likely among MH households with up to three protective factors, and among SA and MHSA with up to five factors; above these thresholds, the cumulative number of protective factors was protective for all three exposures.

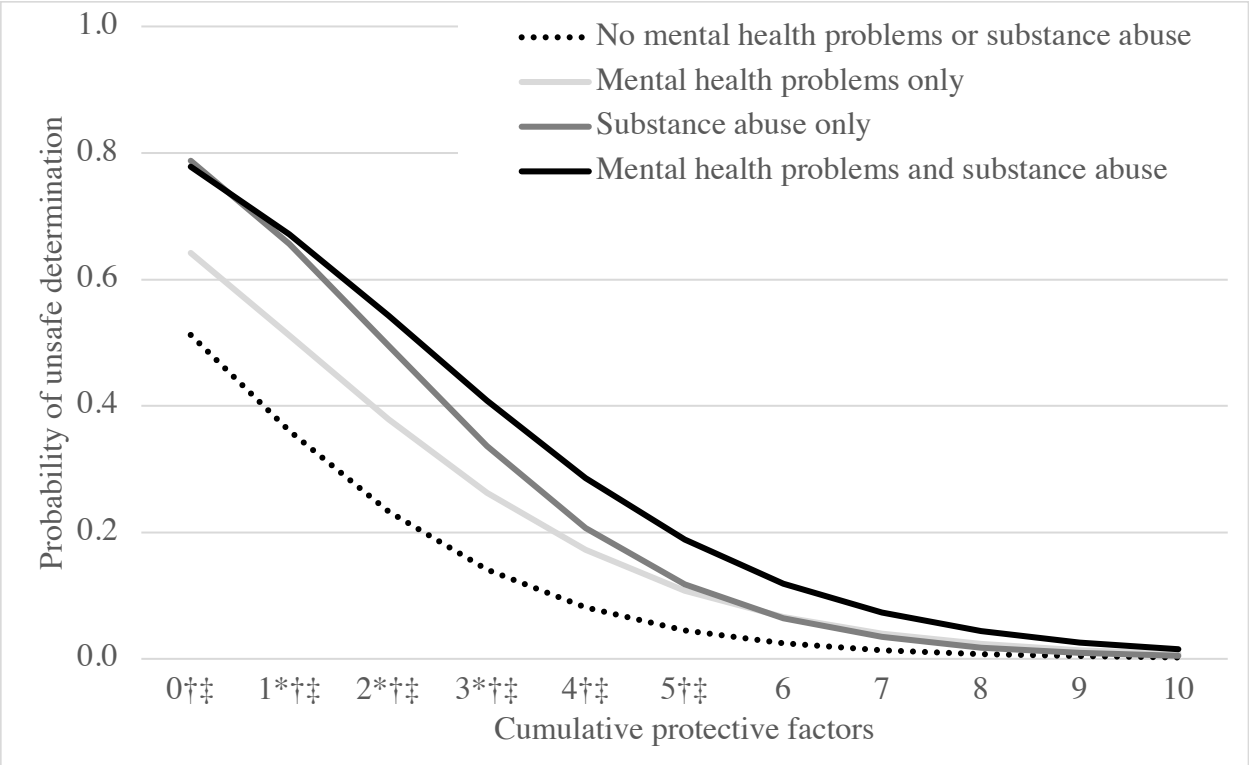

Figure 2.5. Effect of cumulative protective factors on association of exposure with safety decision.

Note. n=1,420 households with one or more safety threats.
* Marginal effect of mental health problems only significant at $p \leq 0.05$
† Marginal effect of substance abuse only significant at $p \leq 0.05$
‡ Marginal effect of mental health problems and substance abuse significant at $p \leq 0.05$

Low Threat Households. Table 2.2 shows that among low threat households with no protective factors, the odds of unsafe determination were non-significantly higher in MH, SA, and MHSA households than in households with no MH or SA. In households with no MH or SA, the odds of an unsafe determination decreased more than 60% for every additional protective factor (OR=0.37, $p \leq 0.001$). In MH households, each additional protective factor was associated with 85% higher odds of unsafe determination (OR=1.85, $p \leq 0.001$) on top of the base rate of OR=0.37, for a combined OR=0.68 ($p \leq 0.01$), indicating a cumulative protective effect for parents with MH. The exposure-protective factor interaction was marginally significant for SA and non-significant for MHSA.

Marginal effect estimates displayed in Figure 2.6 suggest that cumulative protective factors were protective against unsafe determinations for all exposure groups, though the effect was most dramatic among households with no MH or SA. Unsafe determinations were more

likely for MH households up to five protective factors for SA households up to four factors, and for MHSA households up to two factors.

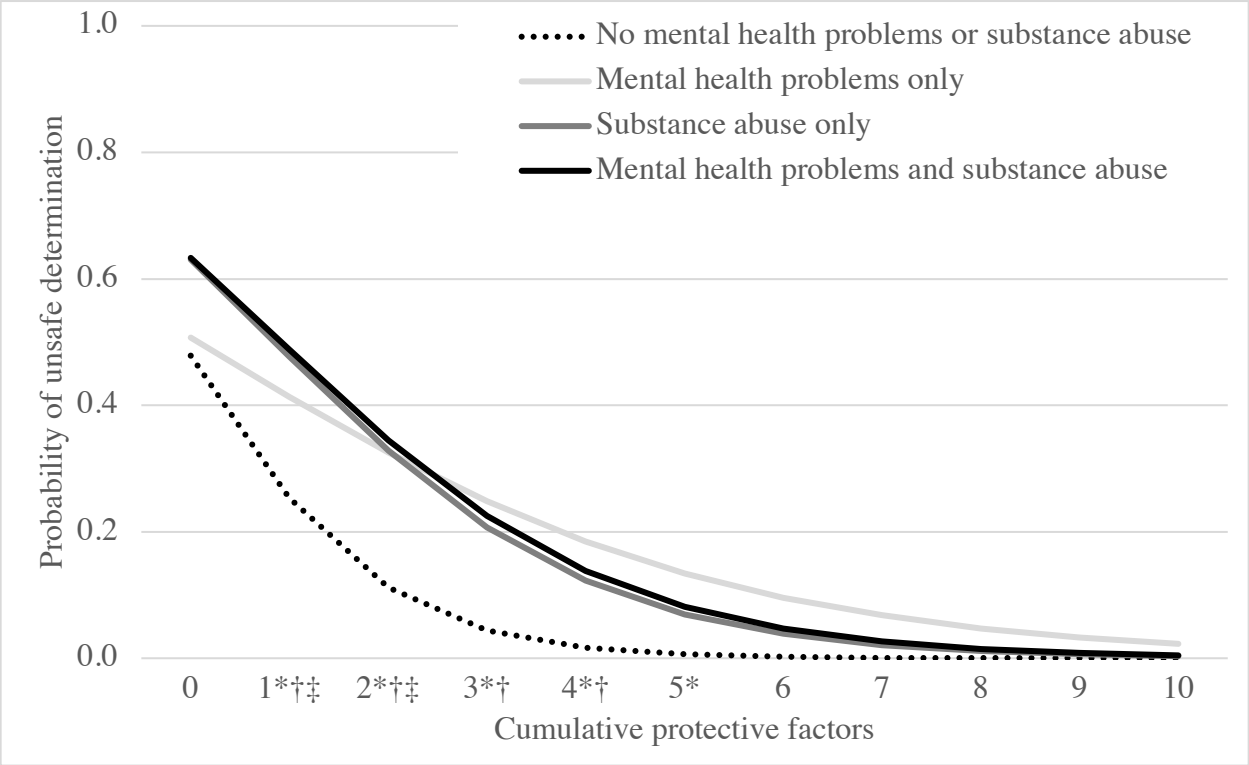

Figure 2.6. Effect of cumulative protective factors on association of exposure with safety decision among households with one safety threat.

Note. n=883 households with one safety threat.
* Marginal effect of mental health problems only significant at $p \leq 0.05$
† Marginal effect of substance abuse only significant at $p \leq 0.05$
‡ Marginal effect of co-occurring mental health problems and substance abuse significant at $p \leq 0.05$

High Threat Households. Table 2.2 shows that among high threat households with no protective factors, the odds of unsafe determination were non-significantly in MH households, nearly three times as high in SA households (*OR*=2.84, $p \leq 0.01$) and more than twice as high in MHSA households (*OR*=2.47, $p \leq 0.01$). In households with no MH or SA, the odds of an unsafe determination decreased 32% for every additional protective factor (*OR*=0.68, $p \leq 0.001$). The exposure-protective factor interaction term was non-significant for MH and MHSA households. Among SA households, each additional protective factor was associated with 25% lower odds of unsafe determination (*OR*=0.75, $p \leq 0.05$) on top of the base rate of *OR*=0.68, for a combined *OR*=0.48 ($p \leq 0.01$), indicating a cumulative protective effect for parents with SA. Marginal effect estimates displayed in Figure 2.7 suggest that the presence of two or more factors was fully protective for all exposures.

As a sensitivity analysis, we re-performed the cumulative effects analysis on the sample stratified by referral response type: immediate response (n=896) versus 10-day response

(n=516). Results of this sensitivity analysis, shown in Table A2, were generally consistent with the main findings.[1]

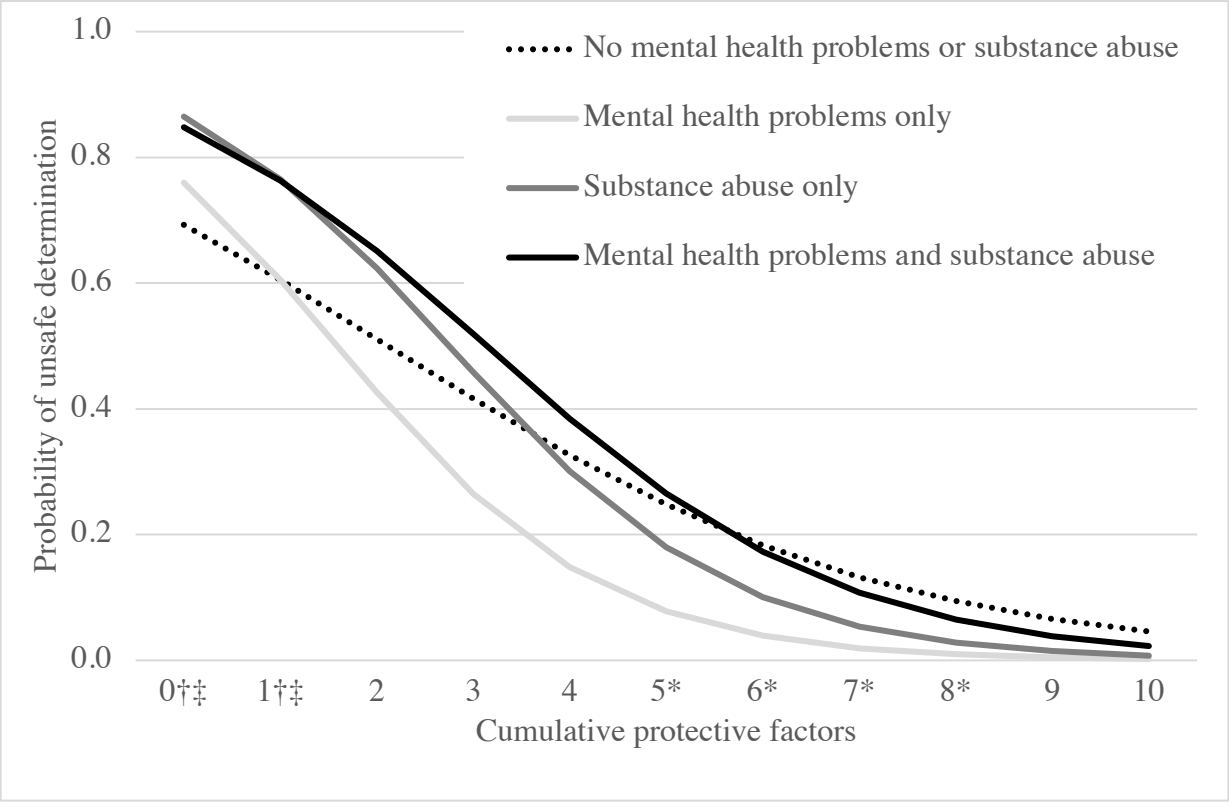

Figure 2.7. Effect of cumulative protective factors on association of exposure with safety decision among households with two or more safety threats.

Note. n=537 households with two or more safety threats.
***** Marginal effect of mental health problems only significant at $p \leq 0.05$
† Marginal effect of substance abuse only significant at $p \leq 0.05$
‡ Marginal effect of co-occurring mental health problems and substance abuse significant at $p \leq 0.05$

Individual Protective Factors Analysis

Table 2.3 shows that for each individual protective factor, the main effects of SA and MHSA were significant and greater than one, meaning that they were associated with significantly higher odds of an unsafe determination in the absence of that protective factor; this was true for only four of the 11 protective factors in the case of MH. After adjusting for cumulative protective factors, the main effect of only one of the individual protective factors was associated with significantly lower odds of unsafe determination: Recognizes Problems (*OR*=0.28, *p*=0.005). The odds ratios for Accesses Resources (*OR*=0.46, *p*=0.01) and Protective Action (*OR*=0.23, *p*=0.01) were both less than one and had *p*-values that would have been

[1] Note that eight households had "evaluate out" or "N/A secondary report" referral. These households were excluded from the sensitivity analysis.

significant without the multiple testing correction. Accepts Intervention (*OR*=2.51, *p*=0.005) was associated with significantly higher odds of unsafe determination after controlling for the cumulative effect. The odds ratio associated with cumulative protective factors was significantly less than one in every model. None of the interaction term estimates for any model met the Bonferroni significance threshold.

Table 2.3
Effect of individual protective factors on association between parental mental health problems/substance abuse and safety decision

	OR	99.9% CI	OR	99.9% CI
	Child capacity		**Caregiver capacity**	
Protective factor	1.47	(0.50, 4.36)	0.74	(0.27, 2.03)
Exposure				
MH	2.05*	(0.82, 5.13)	1.69	(0.66, 4.30)
SA	3.30*	(1.55, 7.04)	3.82*	(1.67, 8.74)
MHSA	3.91*	(1.56, 9.85)	3.60*	(1.36, 9.53)
Exposure-protective factor interaction				
MH	0.44	(0.02, 9.74)	1.98	(0.20, 19.97)
SA	1.19	(0.10, 13.85)	0.46	(0.08, 2.53)
MHSA	0.49	(0.01, 19.46)	1.05	(0.12, 8.91)
Cumulative protective factors	0.54*	(0.45, 0.64)	0.58*	(0.47, 0.70)
Assessment year	0.95	(0.85, 1.06)	0.95	(0.84, 1.06)
Child referral history	0.59	(0.24, 1.45)	0.58	(0.23, 1.42)
Child ages 0-5	0.70	(0.35, 1.39)	0.65	(0.34, 1.22)
Race				
White	1.09	(0.48, 2.44)	1.10	(0.49, 2.48)
Hispanic	0.83	(0.42, 1.65)	0.83	(0.42, 1.66)
Asian	0.76	(0.31, 1.91)	0.76	(0.30, 1.90)
Mixed	1.79	(0.21, 15.17)	1.81	(0.21, 15.29)
Intercept	1.77	(0.73, 4.29)	1.94*	(0.82, 4.58)
	Recognizes problems		**Accesses resources**	
Protective factor	0.38*	(0.11, 1.35)	0.46	(0.14, 1.48)
Exposure				
MH	1.65	(0.66, 4.14)	1.81	(0.70, 4.65)
SA	3.08*	(1.36, 6.95)	2.91*	(1.30, 6.50)
MHSA	2.96*	(1.15, 7.61)	3.02*	(1.16, 7.85)
Exposure-protective factor interaction				
MH	2.21	(0.16, 30.96)	1.17	(0.09, 15.13)
SA	1.64	(0.29, 9.39)	1.87	(0.35, 10.11)
MHSA	3.80	(0.42, 34.24)	3.11	(0.35, 27.28)
Cumulative protective factors	0.58*	(0.48, 0.71)	0.57*	(0.47, 0.69)

Assessment year	0.94	(0.84, 1.06)	0.94	(0.84, 1.06)
Child referral history	0.57	(0.23, 1.41)	0.58	(0.24, 1.44)
Child ages 0-5	0.68	(0.36, 1.28)	0.66	(0.35, 1.24)
Race				
White	1.08	(0.48, 2.42)	1.11	(0.50, 2.50)
Hispanic	0.83	(0.42, 1.66)	0.85	(0.43, 1.68)
Asian	0.79	(0.31, 1.98)	0.76	(0.31, 1.91)
Mixed	2.17	(0.23, 20.11)	1.96	(0.22, 17.41)
Intercept	2.04*	(0.86, 4.79)	2.07*	(0.87, 4.90)
	Supportive relationships		**Protective action**	
Protective factor	1.09	(0.35, 3.43)	0.23	(0.03, 1.83)
Exposure				
MH	1.65	(0.64, 4.27)	2.13*	(0.84, 5.39)
SA	3.49*	(1.55, 7.84)	3.11*	(1.48, 6.51)
MHSA	4.13*	(1.47, 11.60)	3.82*	(1.51, 9.64)
Exposure-protective factor interaction				
MH	2.14	(0.26, 17.67)	0.65	(0.02, 26.86)
SA	0.78	(0.15, 4.19)	1.33	(0.03, 54.96)
MHSA	0.66	(0.09, 4.91)	0.50	(0.00, 55.85)
Cumulative protective factors	0.54*	(0.44, 0.66)	0.57*	(0.48, 0.68)
Assessment year	0.95	(0.85, 1.06)	0.96	(0.85, 1.07)
Child referral history	0.59	(0.24, 1.44)	0.60	(0.24, 1.48)
Child ages 0-5	0.63*	(0.33, 1.18)	0.65	(0.34, 1.23)
Race				
White	1.07	(0.47, 2.42)	1.15	(0.51, 2.60)
Hispanic	0.81	(0.40, 1.63)	0.87	(0.44, 1.73)
Asian	0.74	(0.29, 1.85)	0.81	(0.32, 2.03)
Mixed	1.87	(0.22, 15.90)	2.00	(0.22, 18.30)
Intercept	2.02*	(0.85, 4.82)	1.84*	(0.79, 4.29)
	Accepts intervention		**Healthy parent-child relationship**	
Protective factor	2.61*	(0.90, 7.57)	1.71	(0.51, 5.74)
Exposure				
MH	2.10*	(0.79, 5.55)	1.72	(0.66, 4.50)
SA	3.41*	(1.48, 7.86)	3.39*	(1.56, 7.37)
MHSA	3.73*	(1.36, 10.21)	3.45*	(1.34, 8.89)
Exposure-protective factor interaction				
MH	0.50	(0.05, 4.66)	1.37	(0.15, 12.48)
SA	0.66	(0.14, 3.14)	0.83	(0.11, 6.42)

MHSA	0.75	(0.11, 5.31)	2.20	(0.16, 29.64)
Cumulative protective factors	0.49*	(0.40, 0.61)	0.51*	(0.42, 0.62)
Assessment year	0.95	(0.84, 1.06)	0.94	(0.84, 1.06)
Child referral history	0.58	(0.24, 1.43)	0.59	(0.24, 1.45)
Child ages 0-5	0.63*	(0.33, 1.19)	0.63*	(0.34, 1.19)
Race				
White	1.10	(0.49, 2.49)	1.16	(0.51, 2.63)
Hispanic	0.82	(0.41, 1.63)	0.86	(0.43, 1.72)
Asian	0.77	(0.31, 1.94)	0.75	(0.30, 1.89)
Mixed	1.95	(0.22, 17.16)	2.05	(0.23, 18.00)
Intercept	1.94*	(0.82, 4.61)	2.01*	(0.86, 4.69)
	Committed		**History of problem-solving**	
Protective factor	2.12	(0.55, 8.21)	3.81	(0.51, 28.55)
Exposure				
MH	1.75	(0.69, 4.43)	1.96*	(0.79, 4.82)
SA	3.51*	(1.63, 7.57)	3.32*	(1.59, 6.95)
MHSA	3.72*	(1.44, 9.65)	3.82*	(1.54, 9.47)
Exposure-protective factor interaction				
MH	1.88	(0.16, 21.58)	0.29	(0.01, 14.58)
SA	0.78	(0.08, 7.72)	1.54	(0.04, 64.26)
MHSA	0.94	(0.08, 10.89)	2.26	(0.00, 2503.28)
Cumulative protective factors	0.50*	(0.40, 0.62)	0.52*	(0.43, 0.62)
Assessment year	0.95	(0.85, 1.06)	0.95	(0.85, 1.06)
Child referral history	0.59	(0.24, 1.45)	0.60	(0.24, 1.49)
Child ages 0-5	0.61*	(0.32, 1.15)	0.64	(0.34, 1.20)
Race				
White	1.07	(0.48, 2.41)	1.10	(0.49, 2.46)
Hispanic	0.85	(0.43, 1.70)	0.87	(0.44, 1.74)
Asian	0.76	(0.30, 1.91)	0.79	(0.32, 2.00)
Mixed	1.73	(0.21, 14.46)	1.91	(0.22, 16.33)
Intercept	2.08*	(0.88, 4.92)	1.96*	(0.84, 4.57)
	Other			
Protective factor	1.04	(0.14, 7.52)		
Exposure				
MH	1.85	(0.76, 4.47)		
SA	3.32*	(1.59, 6.93)		
MHSA	3.73*	(1.50, 9.25)		
Exposure-protective factor interaction				
MH	2.88	(0.02, 521.35)		

SA	0.77	(0.03, 23.06)
MHSA	1.02	(0.02, 65.46)
Cumulative protective factors	0.54*	(0.46, 0.64)
Assessment year	0.95	(0.84, 1.06)
Child referral history	0.59	(0.24, 1.44)
Child ages 0-5	0.64	(0.34, 1.20)
Race		
White	1.10	(0.49, 2.46)
Hispanic	0.83	(0.42, 1.66)
Asian	0.76	(0.31, 1.91)
Mixed	1.86	(0.22, 15.71)
Intercept	1.96*	(0.84, 4.59)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for race dummy variables is Black.
* $p \leq 0.005$ (Bonferroni-corrected p-value)

Figure 2.8 displays marginal effect estimates for each individual model, offering an alternative perspective on protective processes. Recall that evidence of protection was defined as risk of unsafe determination that is significantly than that of comparison households in the absence of a protective factor, and non-significantly different (or significantly lower) than that of comparison households in the presence of that protective factor. For MH households, marginal effect estimates suggest these criteria were met for eight of eleven protective factors: Child Capacity, Caregiver Capacity, Access Resources, Protective Action, Accepts Intervention, Committed to Child, History of Problem Solving, and Other. For SA households, these criteria were met for five of eleven protective factors: Caregiver Capacity, Protective Action, Healthy Parent-Child Relationship, Committed to Child, and Other. For MHSA households, these criteria were met for five of eleven protective factors: Child Capacity, Supportive Relationships, Protective Action, History of Problem-Solving, and Other.

Visual evidence of protection is less convincing, however. In the majority of marginal probability plots, the lines do not converge when the protective factor is present; their divergence suggests that risk of unsafe determination is higher in exposure groups than in the comparison group in the presence of the protective factor. This lack of visual evidence of convergent interaction raises the question of whether marginal effects were non-significant in the presence of individual protective factor because of large standard errors and not because risk was truly the same for exposure and comparison households. Indeed, the marginal probability plot for Protective Action is the only plot that visually demonstrates clear evidence of protection for all three exposure groups. For MH households, evidence of protection is also visible in the plots of Child Capacity, Accepts Intervention, and History of Problem-Solving. For SA households, evidence of protection is visible in the plot of Caregiver Capacity. For MHSA households, evidence of protection is visible in the plot of Child Capacity and, to a lesser degree, Supportive Relationships. Taken together, the marginal effect estimates and visual evidence suggest that some individual factors provide protective effects above and beyond that of the cumulative number of protective factors, though these results should be interpreted with caution.

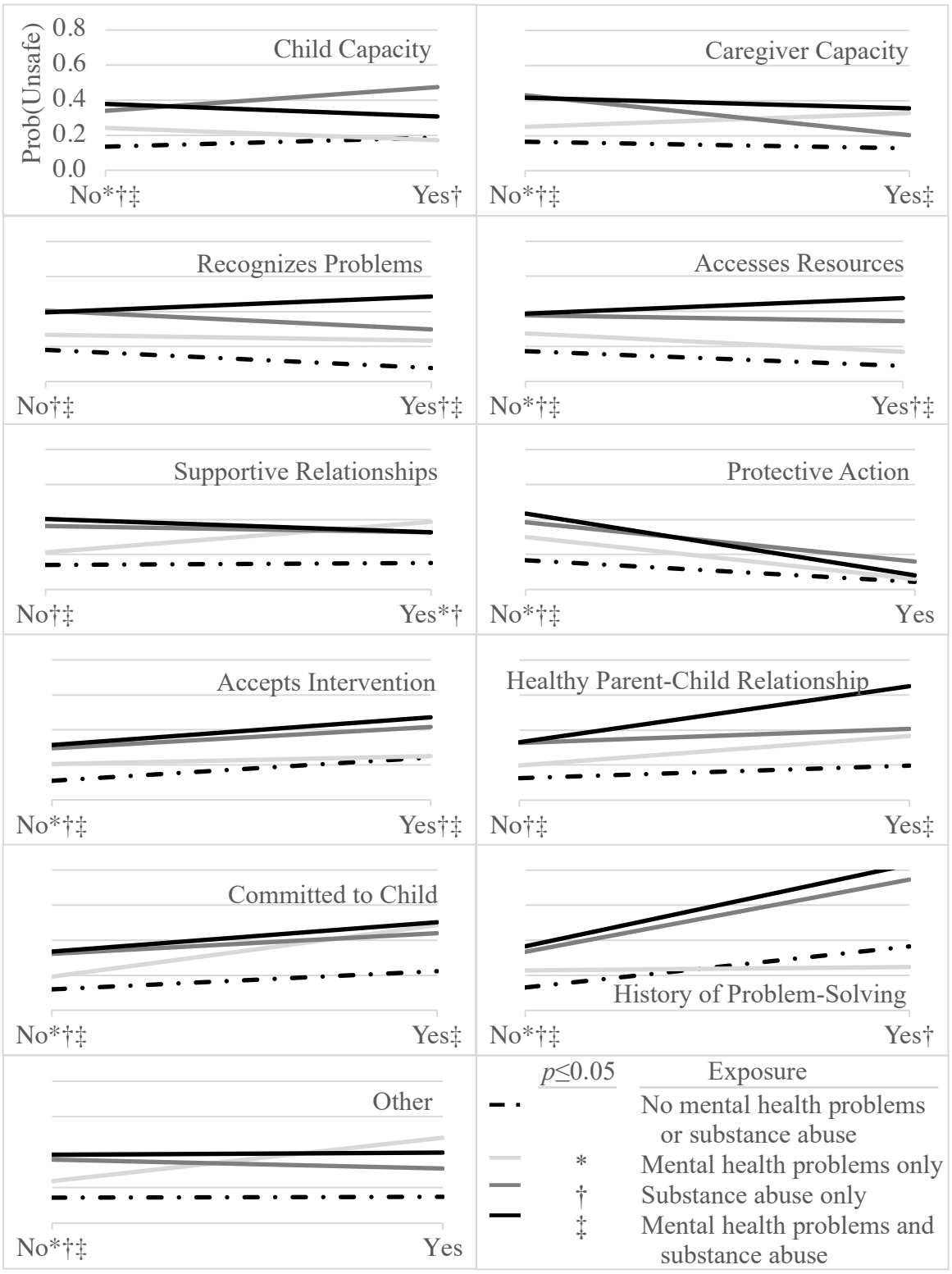

Figure 2.8. Marginal effects of protective factors on association of exposure with safety decision.

Note. n=1,420 households with one or more safety threats.

Threat-Specific Protection Analysis

Households with Parental Mental Health Problems Only. Table 2.4 shows that in the absence of any protective factors, risk of unsafe determination was higher in MH households with the Immediate Needs threat versus MH households without it (*OR*=4.94, *p*<0.05), and additional protective factors did not mitigate that risk difference (*OR*=0.55, *p*=0.25).

Table 2.4

Effect of cumulative protective factors on association between specific safety threats and safety decision among households with parents experiencing current mental health problems only

	OR	95% CI
Compared to Households with MH Only & No Failure to Meet Immediate Needs		
Number of protective factors	0.62***	(0.49, 0.80)
MH & failure to meet immediate needs	4.94*	(1.03, 23.70)
Protective factors x MH & failure to meet immediate needs	0.55	(0.20, 1.51)
Number of safety threats	1.29	(0.85, 1.96)
Assessment year	0.97	(0.82, 1.15)
Child referral history	-	-
Child ages 0-5	2.38†	(0.88, 6.42)
Race		
White	1.18	(0.36, 3.84)
Hispanic	1.00	(0.33, 3.01)
Asian	1.39	(0.41, 4.75)
Mixed	1.46	(0.10, 22.00)
Intercept	0.49	(0.11, 2.26)
Compared to Households with MH Only & No Previous Maltreatment		
Number of protective factors	0.59***	(0.47, 0.75)
MH & previous maltreatment	-	-
Protective factors x MH & previous maltreatment	-	-
Number of safety threats	1.42	(0.92, 2.18)
Assessment year	0.97	(0.82, 1.15)
Child referral history	-	-
Child ages 0-5	1.85	(0.72, 4.75)
Race		
White	1.05	(0.32, 3.38)
Hispanic	0.98	(0.33, 2.90)
Asian	1.19	(0.35, 3.96)
Mixed	0.52	(0.02, 10.95)
Intercept	0.74	(0.17, 3.27)

Notes. MH=Current mental health problems; reference group for race dummy variables is Black.
† $p \leq 0.10$

* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$
- not estimable

Marginal effect estimates displayed in Figure 2.9 suggest that one or more protective factors reduced initial risk differences to non-significance.

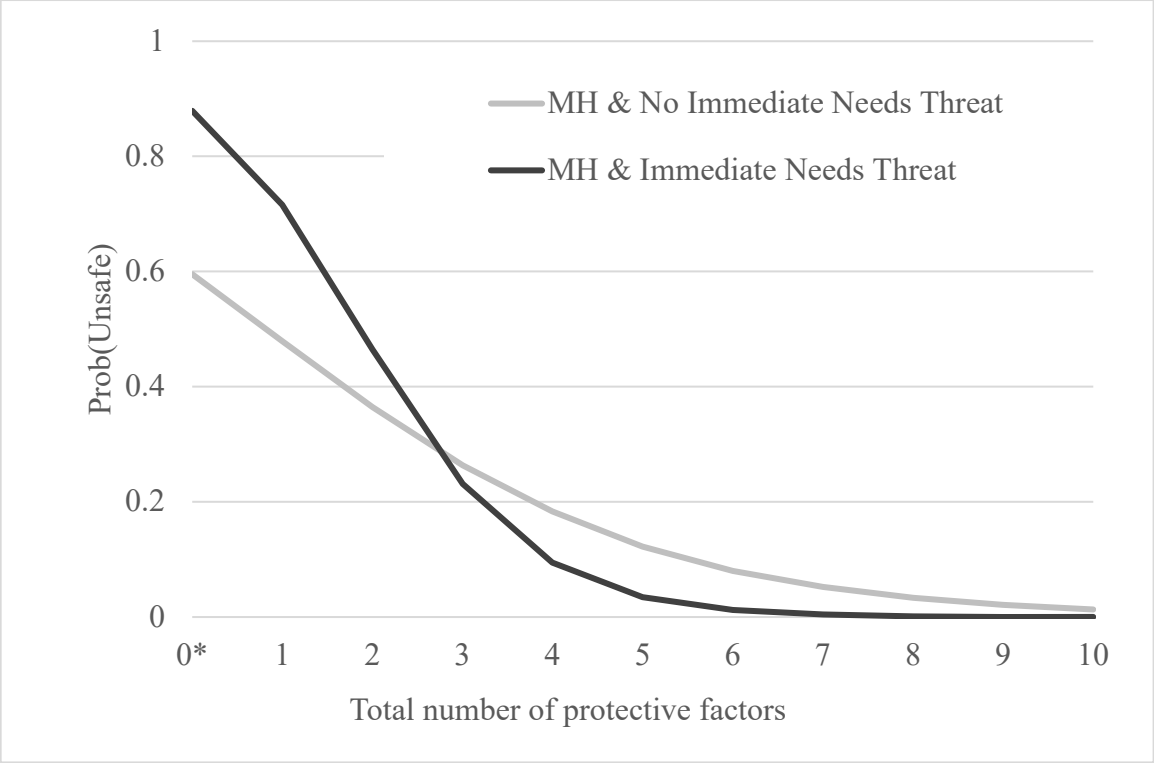

Figure 2.9. Effect of cumulative protective factors on risk of unsafe determination in households with versus without parental mental health problems and the Immediate Needs threat.

Note. MH=Current mental health problems.

Table 2.4 shows that several key parameters in the Previous Maltreatment model were not estimable, rendering the results uninterpretable. These results are likely due to small cell sizes; only 13 MH households had the Previous Maltreatment threat documented.

Households with Parental Mental Health Problems and Substance Abuse. Table 2.5 shows that in the absence of any protective factors, risk of unsafe determination was marginally significantly higher in MHSA households with the Immediate Needs threat versus MHSA households without it (OR=3.73, p<0.10), and additional protective factors did not mitigate that risk difference (OR=1.05, p=0.84).

Table 2.5

Effect of cumulative protective factors on association between specific safety threats and safety decision among households with parents experiencing current mental health problems and substance abuse

	OR	95% CI
Compared to Households with MHSA & No Failure to Meet Immediate Needs		
Number of protective factors	0.54***	(0.39, 0.73)
MHSA & failure to meet immediate needs	3.73†	(0.84, 16.52)
Protective factors x MHSA & failure to meet immediate needs	1.05	(0.64, 1.73)
Number of safety threats	1.64**	(1.12, 2.39)
Assessment year	0.82*	(0.69, 0.98)
Child referral history	0.52	(0.10, 2.75)
Child ages 0-5	1.00	(0.27, 3.74)
Race		
White	0.94	(0.34, 2.60)
Hispanic	0.51	(0.18, 1.46)
Asian	1.49	(0.18, 12.60)
Mixed		
Intercept	2.72	(0.42, 17.55)
Compared to Households with MHSA & No Physical Harm		
Number of protective factors	0.52***	(0.38, 0.72)
MHSA & physical harm	0.96	(0.32, 2.91)
Protective factors x MHSA & physical harm	1.17	(0.74, 1.85)
Number of safety threats	1.90***	(1.31, 2.76)
Assessment year	0.82*	(0.68, 0.97)
Child referral history	0.57	(0.11, 3.07)
Child ages 0-5	0.86	(0.24, 3.01)
Race		
White	0.80	(0.30, 2.14)
Hispanic	0.48	(0.17, 1.35)
Asian	1.74	(0.20, 14.72)
Mixed	-	-
Intercept	3.32	(0.57, 19.26)

Notes. MHSA=Current mental health problems and substance abuse; reference group for race dummy variables is Black.

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

- not estimable

Marginal effect estimates suggest that five or more protective factors reduce initial risk differences to non-significance (see Figure 2.10).

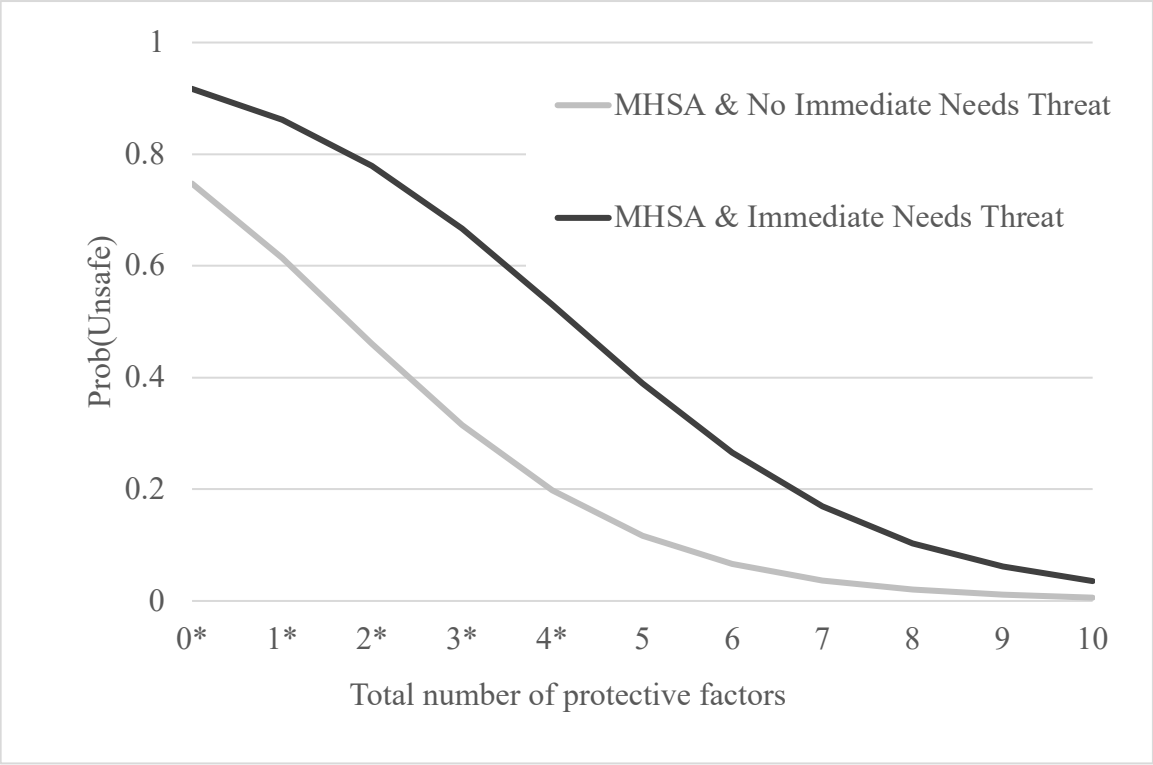

Figure 2.10. Effect of cumulative protective factors on risk of unsafe determination in households with versus without co-occurring parental mental health problems and substance use and the Immediate Needs threat.

Note. MHSA=Current mental health problems and substance abuse.

With respect to the Physical Harm threat, Table 2.5 shows no significant risk differences and no interactions between comparison group and number of protective factors. Figure 2.11 indicates no risk differences irrespective of number of protective factors.

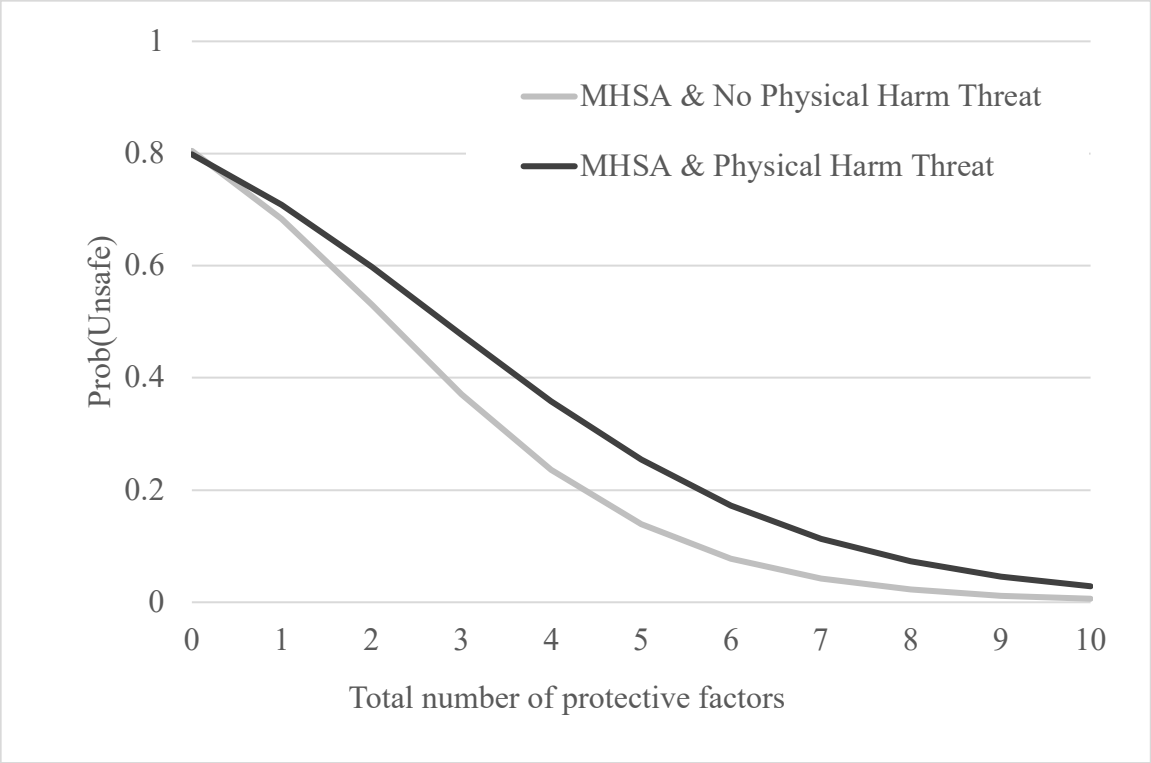

Figure 2.11. Effect of cumulative protective factors on risk of unsafe determination in households with versus without co-occurring parental mental health problems and substance use and the Physical Harm threat.

Note. MHSA=Current mental health problems and substance abuse.

Re-Referral Analysis

In the overall study sample of households with no placements (n=3,583), 20% of households were re-referred within twelve months for maltreatment allegations. Re-referral rates were 19% among "safe" households, 21% among "safe with plan" households, and 13% among "unsafe" households (which are typically at lower risk of re-referral because they have generally received services). Table 2.6 shows that among safe with plan households (n=884), households with no MH or SA were re-referred at a rate of 19%. The rate was lower among MH households (17%) and higher among SA (24%) and MHSA households (40%), with chi-square testing suggesting that these differences were significant (chi2[3]=12.96, p=0.01). The overall substantiated re-referral rate among "safe with plan" households with no placements (7%) also differed significantly by exposure (chi2[3]=11.14, p=0.01), with MH households having a lower rate (3%) than households with no MH or SA (6%), SA households (12%) and MHSA households (13%).

Table 2.6
Percent of households determined "safe with plan" that were re-referred within twelve months

	Re-referral Within Twelve Months	Substantiated Re-referral Within Twelve Months
Total households (n=884)	21	7
No mental health problems or substance abuse (n=635)	19	6
Mental health problems only (n=86)	17	3
Substance abuse only (n=115)	24	12
Mental health problems and substance abuse (n=48)	40	13

Results from logistic regression models (see Table 2.7) provided no evidence of association between exposure or number of protective factors and odds of maltreatment re-referral within twelve months among "safe with plan" households with no placements. This was true for the overall sample, as well as within low-threat and high-threat sub-groups. MHSA households with no protective factors nearly seven times as likely as households with no MH or SA to be re-referred (OR=6.92, $p\leq$0.01), but only among low-threat households. There was limited evidence of interaction between protective factors and exposure, with SA households being somewhat more likely than households with no MH or SA to experience re-referral for every additional protective factor; this was true in the overall sample (OR=1.24, $p\leq$0.05) as well as the high-threat subsample (OR=1.70, $p\leq$0.05). These interactions should be interpreted cautiously, however, due to small cell sizes; only 11 SA households had eight or more protective factors.

Table 2.7

Effect of cumulative protective factors on risk of maltreatment re-referral within twelve months

	Households with ≥ 1 Safety Threat (n=884)		Households with 1 Safety Threat (n=690)		Households with ≥ 2 Safety Threats (n=194)	
	OR	95% CI	OR	95% CI	OR	95% CI
Number of protective factors	0.98	(0.91, 1.05)	0.97	(0.89, 1.05)	1.05	(0.87, 1.26)
Exposure						
MH	0.67	(0.23, 1.96)	0.52	(0.14, 1.88)	1.24	(0.14, 10.92)
SA	0.56	(0.22, 1.44)	0.73	(0.24, 2.16)	0.22	(0.02, 2.18)
MHSA	2.61†	(0.91, 7.52)	6.92**	(1.69, 28.38)	0.74	(0.08, 6.52)
Exposure-protective factor interaction						
MH	1.10	(0.87, 1.39)	1.19	(0.91, 1.55)	0.92	(0.54, 1.57)
SA	1.24*	(1.03, 1.49)	1.11	(0.89, 1.39)	1.70*	(1.06, 2.72)
MHSA	0.99	(0.79, 1.24)	0.85	(0.62, 1.18)	1.17	(0.79, 1.73)
Assessment year	0.98	(0.91, 1.05)	0.99	(0.92, 1.07)	0.96	(0.81, 1.13)
Child referral history	1.68*	(1.09, 2.60)	1.50	(0.90, 2.47)	2.81*	(1.02, 7.73)
Child ages 0-5	1.01	(0.71, 1.45)	0.90	(0.60, 1.36)	1.62	(0.69, 3.80)
Race						
White	1.03	(0.60, 1.78)	0.76	(0.39, 1.45)	2.03	(0.57, 7.23)
Hispanic	0.95	(0.62, 1.45)	1.00	(0.62, 1.61)	1.02	(0.37, 2.82)
Asian	0.75	(0.43, 1.32)	0.84	(0.46, 1.52)	0.42	(0.07, 2.41)
Mixed	1.03	(0.31, 3.41)	1.18	(0.30, 4.66)	0.70	(0.06, 7.86)
Intercept	0.27***	(0.16, 0.48)	0.31***	(0.16, 0.57)	0.12*	(0.02, 0.62)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for race dummy variables is Black; analysis sample include only "safe with plan" households with no placements.

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

2.4. Discussion

This study examined associations between protective factors and safety decisions among households investigated for maltreatment allegations and tested whether these associations varied depending on parent mental health and substance use status. Consistent with previous findings (Roscoe et al., 2018), in the absence of protective factors, SA and MHSA households tended to have higher risk of unsafe determination than MH households, and all three groups were generally at higher risk than households with no MH or SA. Results of protective factor analyses tended to support a cumulative protection model; each additional protective factor was associated with a decrease in risk of unsafe determination, and this cumulative effect was more substantial among households with greater numbers of safety threats. Results also suggested that cumulative protective factors reduced risk differences for households in all three exposure groups relative to households with no MH or SA.

Marginal effect estimates from individual protective factor models suggested that MH households tended to experience risk reductions in the presence of a wider range of individual protective factors than did SA or MHSA households, though logistic regression results suggested no individual protective effects. For all three exposure groups, risk of unsafe determination was lower when parents took protective action on behalf of their children, as well as when they had a history of problem-solving. In contrast to previous empirical studies, supportive relationships appeared to have no individual protective effect in this analysis.

In general, cumulative protective factors tended to reduce risk associated with the safety threats that accounted for increased risk of unsafe determination among MH and MHSA households in chapter 1, with the exception of the Physical Harm threat for MHSA households. Finally, the re-referral rate among households determined safe with plan was the same as the re-referral rate for households with no safety threats, and there were no significant differences by exposure or cumulative number of protective factors in terms of re-referral risk, regardless of whether re-referral allegations were substantiated.

Practice Implications

Findings from studies of resilience are routinely used to guide the development of preventive interventions that foster growth of protective factors in populations with specific risk factors (Greenberg et al., 2001; Mrazek & Haggerty, 1994). This study suggests that a greater number of protective factors mitigates risk of unsafe determination irrespective of which protective factors are indicated. However, this study also identified a group of specific protective factors, each of which individually lowered risk of unsafe determination for at least two of three exposure groups. Scholars distinguish among malleable and non-malleable protective factors, the former being plausible targets of preventive interventions (Greenberg et al., 2001). In the current study, several of the identified protective factors may be considered malleable and may thus be leveraged in the context of new or existing preventive interventions to reduce risk of future child welfare involvement among households currently investigated for maltreatment. These include Child Capacity, Caregiver Capacity, Protective Action, and Supportive Relationships.

Child Capacity. MH and MHSA households experienced reductions in risk of unsafe determination in the presence of the Child Capacity protective factor. In the context of the SDM safety assessment, the Child Capacity protective factor specifically refers to a child's "cognitive, physical, and emotional capacity to participate in safety interventions" (NCCD, 2015). This includes understanding "his/her family environment in relation to any real or perceived threats to safety" and the ability "to communicate at least two options for obtaining immediate assistance if needed" (NCCD, 2015, p. 45). A child's repertoire of safety skills can be cultivated and

rehearsed as a possible preventive measure in the event of emergent threats to child safety in the home. Furthermore, a child's ability to understand "his/her family environment in relation to any real or perceived threats to safety" may be similar to the reserved, controlled temperament found to be protective by Cicchetti et al. (1993), in that children who are more wary and calm may more effectively navigate a tumultuous family home environment. As defined by SDM, Child Capacity may help limit the duration of a child's exposure to a parent's maltreatment. In terms of reducing the likelihood that the parent will re-perpetrate maltreatment in the future, however, the protective value of fostering Child Capacity seems limited unless there is an accompanying parent intervention. Thus the best method of translating this finding into practice is likely to cultivate such skills within the context of a family-based interventions already vetted by the Title IV- E Prevention Services Clearinghouse (e.g., Multisystemic Therapy, Brief Strategic Family Therapy, Healthy Families America; ACF & DHHS, n.d.). However, providers should be mindful that the malleability of child capacity is likely dependent on age; clearly, interventions focusing on child capacity are unlikely to be appropriate for infants.

Caregiver Capacity. MH and SA households experienced reductions in risk of unsafe determination when caregivers were documented as having "the cognitive, physical, and emotional capacity to participate in safety interventions" (NCCD, 2015). Deficits in physical capacity are an important concern for adults with mental health problems. Medical comorbidity is high among these individuals, with common comorbidities including hypertension, obesity, dyslipidemia, and diabetes (Druss et al., 2008). Numerous studies have linked mental health problems to underutilization of healthcare services (Corrigan et al., 2014; Druss et al., 2008, 2009; Mowbray et al., 2004), suggesting that medical comorbidities are typically undertreated in this population, although more recent research indicates otherwise, at least among individuals with severe mental illness (Mangurian et al., 2020). Building physical capacity vis-à-vis proactive referral to, and ongoing coordination with, medical providers may better equip parents with mental health problems to attend to caregiving responsibilities, thereby decreasing risk of future maltreatment referral. Likewise, cognitive and emotional problems are known contributors to maltreatment risk (Azar et al., 2012; Azar & Read, 2009; Mullick et al., 2001). Assessing and rehabilitating cognitive and emotional capacity through ongoing coordination with mental and occupational health providers may also help decrease risk of future maltreatment. Cognitive remediation interventions have demonstrated effectiveness among patients with schizophrenia, depression, and other disorders, in reducing symptoms and improving psychosocial functioning, as well as functioning across a variety of cognitive domains (McGurk et al., 2007; Motter et al., 2016). However, it is unclear how these interventions might affect the malleability of cognitive and emotional functioning as factors to protect against maltreatment recurrence. In the context of existing maltreatment prevention programs (e.g., Parents as Teachers; ACF & DHHS, n.d.) that focus on skill-development among parents with mental health problems or substance abuse, cognitive remediation may represent a useful additive treatment, albeit subject to empirical examination. A number of behavioral and cognitive interventions and treatment modifications are also available for use as additive elements to existing programs when parents have cognitive capacity deficits; these include parenting skills training programs presented in a more basic and partialized format, modeling skills for parents, and frequent and consistent reinforcement of skill use (Azar et al., 2013).

Protective Action. Results suggested that children of caregivers with MH, SA, or MHSA were no more likely to be determined unsafe than children of caregivers with no MH or SA if a parent took protective action on their behalf, including asking the maltreatment perpetrator to

leave. This finding may be better understood in relation to the high incidence of victimization and domestic violence among adults with mental health problems. Researchers have reported rates of mental illness as high as 64% among female victims of domestic violence (Golding, 1999), and rates of domestic violence as high as 60% among psychiatric inpatients (Carlile, 1991; Howard et al., 2010). Although prior research did not find evidence that domestic violence accounted for the association between parental mental health problems and unsafe determination (Roscoe et al., 2018), domestic violence is a "hidden epidemic" that typically goes undetected by helping professionals (Hegarty, 2011, p. 169), and was noted as among the three most common child protection concerns in a nationally representative study in Canada (Westad & McConnell, 2012).

The potential problem of undisclosed domestic violence among adults with mental health problems may be further complicated by the aforementioned fact that adults with mental health problems are under-utilizers of health services, meaning that there are fewer opportunities for helping professionals to screen for domestic violence. More severe psychiatric symptoms have been associated with higher levels of self-stigma and lower levels of self-efficacy among adults with mental health problems (Drapalski et al., 2013). This suggests that parents with mental health problems may have particular difficulty asserting their needs and the needs of their children—a fact that may be especially true for the scenario in which a parent with mental health problems lives with an abusive partner. The combination of parental mental health problems, domestic violence, non-disclosure, and low self-efficacy may potentiate maltreatment circumstances in which an adequate safety plan cannot be achieved because perpetrators are not confronted and therefore remain in the home. Steps toward preventing such scenarios might include community mental health services that foster growth of self-esteem, self-efficacy, and assertiveness among child-welfare involved parents with mental health problems.

Supportive Relationships. Numerous protective factors studies have linked social support to reduced risk of maltreatment (Bartlett & Easterbrooks, 2015; Collishaw, Pickles, et al., 2016; Dixon et al., 2009; Herrenkohl et al., 2005; Li et al., 2011). Surprisingly, Supportive Relationships was not as robust a protective factor in this study. One possible explanation for this null finding is that prior literature examined the protective effect of social supports in the context of maltreatment risk, whereas in the present study, protective effects were examined in the context of child removal risk among child-welfare involved parents. Social supports are thought to help mitigate parenting stress, which reduces maltreatment risk (Crouch et al., 2001), and researchers have also found that social supports increase parental empathy, thereby reducing risk of maltreatment (Bartlett & Easterbrooks, 2015). It is plausible that the protective effects of social supports are not replicable for parents already being investigated for maltreatment allegations, because maltreatment risk may have already been realized.

Re-referral. Twelve-month re-referral rates differed by exposure group, but only under certain conditions. MHSA households were significantly more likely than households with no MH or SA to be re-referred, but only when there was a single safety threat present in the household. Testing indicated that households with only one threat were less likely to receive family maintenance services (28%) than households with more than one threat (43%; chi2[3]=15.52, p=0.001). Thus, it is possible that among low-threat households, the presence of MHSA (which is typically risk factor for adverse outcomes) increased the risk of re-referral, whereas among high-threat households, family maintenance services mitigated the increased risk of re-referral associated with MHSA.

Limitations

An important limitation regards the study's method of inferring protective processes. As described earlier, this study infers that a protective process is at work when two criteria are met: (1) risk of unsafe determination is significantly higher for the exposure group than for the comparison group in the absence of a protective factor, and (2) risk of unsafe determination for the exposure group is the same as (or lower than) that of the comparison group in the presence of the protective factor. In the case of a low-frequency protective factor (e.g., History of Problem-Solving, Other), criterion 2 may be achieved simply because standard errors are large enough to render point estimates of risk for the exposure and comparison groups non-significantly different. More precise point estimates can be obtained for high-frequency protective factors; in these cases, achieving criterion 2 is more reliable evidence of protection. This caveat also holds for inferences pertaining to cumulative protective factors; given the low frequency of households with high cumulative numbers of protective factors, inferences regarding protection should be considered cautiously in these cases.

Study findings should also be considered in the context of their tests of significance. Whereas logistic regression estimates of interaction term coefficients were often non-significant (suggesting no protective effects), marginal effect estimates often indicated regions of significant difference that suggest protective processes occurred at certain levels of protective factors. Lack of concordance between regression and marginal effect estimates is not uncommon, especially when marginal effects are measured using nonlinear combinations obtained from logistic regression estimates. Some scholars weigh significance tests of regression coefficients more heavily than those of marginal effect estimates; however, the latter allow investigators to examine the thresholds at which differences in marginal predicted probabilities becomes significant, which in this case was useful for visualizing cumulative protection on a continuum.

2.5. Conclusions

Numerous studies have linked parental mental health problems and substance abuse to increased risk of maltreatment and extensive child welfare involvement, yet to date, little research has focused on how and what protective processes may mitigate this risk. The present study examined the cumulative and individual effects of protective factors on the likelihood that protection workers determined children unsafe in the home when parents had mental health problems and/or substance abuse. Findings suggest that as the cumulative number of protective factors increases, parents with mental health problems and/or substance abuse may be no more likely to have children determined unsafe than parents without these issues. Findings also point to specific protective factors that could be fostered within the context of preventive interventions already in use by child welfare providers, among them a parent's psychological and cognitive capacity to provide competent care, supervision, and protection, and a child's capacity to recognize and safely avoid escalating household circumstances. More studies of this nature are warranted, as they may yield further evidence of protective processes that could help tailor interventions for child welfare-involved households affected by parental mental health problems or substance abuse.

Chapter 3

After the investigation: Short- and long-term child welfare outcomes involving parents with mental health problems and substance abuse

Abstract

Background: When a household is referred for allegations of maltreatment, it encounters a number of crucial decision-making junctures: the decision to investigate a referral, to substantiate its allegation(s), and to open a case, among others. California's child welfare system uses the Structured Decision Making® system, a suite of actuarial tools, to guide decision-making at each juncture. Among these tools, the safety assessment plays a pivotal role in assessing current child safety in the home. Dissertation chapter 1 examined why parental mental health problems and substance abuse increase the likelihood that child welfare workers will determine children unsafe in the home during an investigation, and chapter 2 examined the role that family protective factors play in a worker's decision that a child may remain in the home despite current threats to safety. The present study situates these safety decisions within the broader framework of California's child welfare system, examining how the combined effects of the safety decision and parental mental health problems and substance abuse are associated with post-investigative outcomes.

Methods: The dissertation sample of 4,070 Structured Decision Making® assessments administered in San Francisco, CA, from 2007-2015 was merged with referral, case, and placement records, and multiple logistic regression was used to examine associations between safety decision and parental mental health problems/substance and the likelihood of allegation substantiation, receipt of family maintenance services, child out-of-home placement, and re-referral.

Results: Results suggest that the safety decision is dynamic and may change during the referral window, especially among households with documented parental mental health problems or substance abuse. Furthermore, the likelihood of each outcome typically depended on the interaction between safety decision, parental mental health problems, and parental substance abuse. Among households determined "safe," parental mental health problems or substance abuse tended to increase the likelihood of each analysis outcome, whereas among households determined "unsafe," they did not.

Conclusions: Findings suggest that although households with documented parental mental health problems or substance abuse are at greater risk of allegation substantiation, their increased likelihood of service use may make them less likely to be re-referred within twelve months.

3.1. Introduction

When a household is referred for allegations of child maltreatment, it passes through a series of critical decision-making junctures or "gates" (Gelles, 2017) that determine its path through the child welfare system. In California's system, these gates include the decision to investigate a maltreatment referral, to substantiate an allegation of maltreatment, to open a case (including in-home "family maintenance" services or "family reunification" services—hereafter referred to as "placement" for clarity), and to reunify a family, among others. To help guide these decisions, workers use a suite of actuarial tools called the Structured Decision Making® system (SDM; NCCD, 2015), which employs check-box inventories that assess a variety of characteristics, including risk factors, protective factors, parent threats to child safety, and safety interventions. Different tools serve different purposes. For example, the hotline screening tool determine whether the report is likely to meet the statutory definition of child maltreatment, the safety assessment determines whether a child can safely remain in the home during an investigation, and the risk assessment evaluates risk of future maltreatment and helps determine whether or not a case should be opened for ongoing services.

Among the various tools in the SDM suite, the safety assessment is perhaps the most critical in terms of a family's trajectory through California's child welfare system. Not only does it serve as an important means of documenting maltreatment evidence, it also renders a real-time decision as to the immediate safety of the child in the home. The decision falls into one of three categories: (1) "safe:" the child is safe because no safety threats are present; (2) "safe with plan:" at least one safety threat is present, but a safety plan can be instituted that mitigates safety threats, thus permitting the child to remain in the home while the investigation proceeds; (3) "unsafe:" at least one safety threat is present, and no safety plan can be instituted that will keep the child safe in the home. Its combination of immediacy and gravity makes the safety decision a critical juncture in every household's investigation.

The safety decision is also important in that it provides an indication of what might happen at other critical junctures, such as decisions about allegation disposition and case opening. For example, "unsafe" households would be expected to result in at least one substantiated allegation and at least one child placed out-of-home. However, the safety decision is not a perfect predictor of what happens at these other junctures. To illustrate, a "safe" household (i.e., a household with no safety threats checked off) may still have an allegation substantiated by way of other maltreatment evidence. On the other hand, a "safe with plan" or "unsafe" household (i.e., a household with at least one safety threat checked off) may have none of its allegations substantiated if further investigation renders the maltreatment evidence inconclusive or unfounded. As another example, a "safe with plan" household may indeed be more likely than a "safe" household to have a case opened for family maintenance services, but workers sometimes also open a family maintenance case for a "safe" household if an allegation is eventually substantiated (as described above). The safety decision may also share less obvious associations with other more long-term child welfare outcomes, such as maltreatment re-referral; for example, "unsafe" households may be more likely to receive needed services, and therefore less likely to be re-referred. In short, the safety decision is a crucial juncture in the California maltreatment investigation because it can have drastic and immediate repercussions for the family and because it is a plausible predictor (albeit not a perfect one) of other subsequent decisions and outcomes.

Complex Households, Complex Decisions

The safety decision, and how it is made, may also reflect the complexities and uncertainties of the referral and the investigated household. In particular, the "safe with plan" decision reflects the uncertainty inherent in a worker's attempt to counter-balance safety threats with family protective factors and proposed interventions. Recall that a "safe with plan" decision is rendered when a worker elects not to remove a child from the home because a safety plan can be put in place that, at least for the time being, effectively mitigates current threats to child safety. The plan incorporates knowledge of family protective factors and documents safety interventions that the family is ready, willing, and able to carry out in coordination with the worker. In principle, such a plan is a reasonable method of protecting children while maintaining family unity. However, workers yield to a greater amount of uncertainty when rendering a "safe with plan" decision, as opposed to a "safe" or "unsafe" decision. "Safe" and "unsafe" decisions are based exclusively on the material findings of an investigation (i.e., documented evidence of current threats to child safety, or lack thereof), whereas "safe with plan" decisions are predicated on the balance between documented evidence and interventions the family agrees to participate in. Thus a "safe with plan" decision does not justify unilateral intervention on child safety threats in the manner of an "unsafe" decision, nor does it justify foregoing intervention in the manner of a "safe" decision; rather, workers must trust that the proposed safety plan can be carried out with sufficient fidelity and consistency that children remain safe in the home. In the case of more complex households, however, it is plausible that dynamic circumstances might render a safety plan tenable one day and untenable the next.

Re-Assessments and Re-Referrals. For a given household on a given day, a worker's administration of the safety assessment yields a decision that can have immediate consequences in terms of child safety and family unity. However, safety decisions can and do change throughout the investigation of a given referral. Workers conduct maltreatment investigations amidst dynamic, often chaotic, household circumstances, and sometimes households require iterative investigative documentation. For instance, a child or an alleged perpetrator might be absent during a worker's initial in-person meeting and safety assessment, necessitating a follow-up visit and re-assessment. In the present sample, for instance, workers re-administered the safety assessment for eight percent (n=326) of all households within 30 days of referral; in the majority of these cases (n=295), the safety assessment was re-administered only once. As workers gather more information, new safety threats may be documented, and previously documented threats may be contra-indicated. Safety decision modifications in response to such changes in the threat inventory can mean the difference between a case being opened or a child being placed.

Although the present analysis only examines re-assessments associated with a household's initial referral, households are sometimes also re-referred within days of the initial referral, as different reporters call in accounts of suspected maltreatment. In the present sample, for instance, four percent (n=169) of households were re-referred within 30 days of the initial referral. Such an "overlapping re-referral", if investigated, may result in a safety assessment that yields a safety decision (and perhaps even a case opening) that appears inconsistent with the initial referral and its associated safety assessment(s). In short, complex households beget complex decisions that in and of themselves do not fully account for a family's circumstances, nor its trajectory through the child welfare system. Indeed, other case characteristics play a role in determining these outcomes.

Parental Mental Illness and Substance Abuse and the Safety Decision

A myriad of empirical studies has examined case characteristics associated with the likelihood that a family will or will not pass through a given gate in the child welfare system, and almost without exception, parental mental health problems and substance abuse rise to the top of this list. Children of parents with mental health problems and/or substance abuse are at higher risk of involvement across all levels of the child welfare system, from initial maltreatment referral to out-of-home placement.

To begin with, risk of maltreatment referral is higher among parents with mental health problems or substance abuse (O'Donnell et al., 2015). Parents with mental health problems or substance abuse are also more likely to have maltreatment allegations substantiated by investigation (Westad & McConnell, 2012), to have children determined "unsafe" in the home per the SDM safety assessment (Roscoe et al., 2018), and to have children placed out-of-home (Park et al., 2006; Westad & McConnell, 2012), Following the investigation, these parents are more likely to receive ongoing protective services (Westad & McConnell, 2012), and are also at greater risk of permanently losing custody (Taylor et al., 1991). The cause for concern regarding children of parents with mental health problems or substance use is warranted, considering both problems are prevalent in the general population according to studies conducted domestically and abroad. Estimated prevalence of mental health problems among parents ranges from 19% to 47% (Nicholson et al., 2002; Stambaugh et al., 2017). An estimated 55-68% of adults with only mental health problems, and 60-67% of adults with co-occurring mental health problems and substance abuse are parents (Nicholson et al., 2002).

Parental mental health problems and substance abuse are plausible factors to assess in households with more complex and dynamic family circumstances. Severe parental mental illness in particular has been associated with increased problems in the home environment, including distorted relationships and communication, discord among parents, inadequate parental control or over-control, and experiential privation, among others (Malhotra et al., 2015). Unemployment, financial difficulties, social isolation, and over-crowding have also been associated with parental mental illness (Goodman & Gotlib, 1999; Rutter & Quinton, 1984; Wan et al., 2008). Nation-wide analyses have linked increase in rates of overdose and drug-related hospitalizations to increases in the complexity and severity of maltreatment cases (Radel et al., 2018). If such households are referred for allegations of maltreatment, workers may require more time to understand and document family circumstances, and are likely to produce more iterative investigative documentation as a result.

As previously noted, the presence of parental mental health problems or substance abuse puts a family at greater risk of an "unsafe" decision; however, the relationship between parental mental health problems, substance abuse, and the safety decision is likely more nuanced. Given their prominence in the literature as predictors of child welfare outcomes, parental mental health problems and substance abuse may explain some of the variance in decision-making that is left unaccounted for by the safety decision. For instance, if the safety decision does not fully account for whether or not a household receives family maintenance services, perhaps some of the remaining variance in decision-making is attributable to whether or not a parent has mental health problems or substance abuse. Another intriguing possibility is that the association of parental mental health problems or substance use with a given outcome might depend on the safety decision. For example, risk of placement among "safe with plan" households may depend on whether parental mental health problems or substance abuse are present, because parental mental health problems or substance use may complicate efforts to enforce a safety plan, which could ultimately result in children being placed. However, risk of placement among "unsafe"

households may not depend at all on whether parental mental health problems or substance abuse are present, because per SDM policy, an "unsafe" decision is a sufficient criterion for removing a child from the home.

Case Characteristics Associated with Child Welfare Outcomes

It is important to note that parental mental health problems and substance abuse are only two of many case characteristics associated with child welfare outcomes. The literature provides evidence of a plethora of other factors that are predictive of substantiations, case openings, placements, and re-referrals. Each must be considered in any rigorous analysis of such outcomes.

Substantiations. A number of factors have been implicated in studies of substantiation risk among families referred for maltreatment allegations. Perhaps most notable among these study findings is that maltreatment allegations filed by mandated reporters are more likely to be substantiated than those filed by non-mandated individuals (King et al., 2013; McDaniel, 2006). However, household characteristics and parent behaviors have also been found to increase likelihood of substantiation. Examples of household characteristics include child capacity and health problems (Westad & McConnell, 2012), parent capacity and health problems, including mental health and drug/alcohol issues (McDaniel, 2006; Westad & McConnell, 2012), presence of a female child, presence of an infant, and family public benefits receipt (Cross & Casanueva, 2009; King et al., 2013; Westad & McConnell, 2012). The association between race and substantiation is debated. One study found that, relative to Whites, Asian/Pacific Islanders were more likely to have allegations substantiated and Black/African Americans were less likely (King et al., 2013) even after adjusting for a variety of other relevant factors (e.g., Medicaid status), whereas another study with a similar set of adjustment variables found race to be largely unrelated to substantiation likelihood (Cross & Casanueva, 2009).

The literature identifies a number of parent behaviors that increase likelihood of substantiation. Acts of physical harm toward the child, repeated acts of maltreatment, and domestic violence increase likelihood, as does the cumulative amount of maltreatment evidence documented during the investigation (Cross & Casanueva, 2009; English et al., 2002; Westad & McConnell, 2012). Alleged neglect and emotional abuse have been shown to increase likelihood of substantiation whereas alleged physical abuse has been shown to decrease it (King et al., 2013; Westad & McConnell, 2012).

Case Openings. Upon completing a maltreatment investigation, child welfare workers must decide whether to open a case for ongoing services. (When a child is placed out-of-home, a family reunification case is opened; an in-home case is opened in the form of family maintenance services.) In California, case opening decisions are made using the SDM risk assessment, which assesses risk of future child abuse or neglect; thus, case opening is also an intervention aimed at reducing risk of future maltreatment. Studies of case opening decisions implicate a range of case factors. Neglect allegations, allegation substantiation[2], and maltreatment referral history are all associated with increased likelihood of case opening (DePanfilis & Zuravin, 2001; Fallon et al., 2011). Parent and child health/ capacity issues and maternal mental health and drug/alcohol abuse have also been linked with increased likelihood of case opening (DePanfilis & Zuravin, 2001; Fallon et al., 2011; Westad & McConnell, 2012), as well as housing status, household composition, and child age. Those living in public housing or shelter, families with a greater number of children, and families with children ages 0-5 are all at greater risk (DePanfilis & Zuravin, 2001; Fallon et al., 2011; Westad & McConnell, 2012).

[2] Cases may be voluntarily opened in the absence of allegation substantiation.

Placements. Placing a child outside the home is perhaps the most critical decision a child welfare worker will make. Numerous empirical studies have used both real-world data and clinical vignettes to determine what factors child welfare professionals take under consideration when making placement decisions. Maltreatment referral characteristics are strong predictors of the decision to place a child, especially allegations of neglect, emotional, and physical abuse, which all increase likelihood of placement (Westad & McConnell, 2012). In one notable exception, a study found that physical abuse decreased likelihood of placement (Zuravin & DePanfilis, 1997).

A worker who finds evidence of more severe maltreatment (Britner & Mossler, 2002) a greater number of current substantiated allegations, and specific threats such as a perpetrator who threatens the child or failure to protect the child (Rossi et al., 1999) is more likely to place the child out-of-home. Risk of future maltreatment has also been found to increase likelihood of placement (Britner & Mossler, 2002; Graham et al., 2015).

Parent and child factors are also strongly associated with placement decisions, with parent mental health problems and substance abuse being among the most documented characteristics associated with placement (Arad-Davidzon et al., 2006; Britner & Mossler, 2002; Westad & McConnell, 2012; Zuravin & DePanfilis, 1997). Researchers have generally found that parent developmental and cognitive problems, and child functioning problems also increase likelihood of placement (Westad & McConnell, 2012; Zuravin & DePanfilis, 1997), although one study (though dated) found that caregiver mental illness and infant exposure to substances in fact lowered likelihood of placement (Rossi et al., 1999). The same study also identified caregiver criminal record as a risk factor for placement.

Several studies have found an inverse relationship between family income and likelihood of placement (Graham et al., 2015; Lindsey, 1991), although in one study, family income was rated among the least important contributors to placement decisions (Britner & Mossler, 2002). Homelessness, shelter status, and public housing status are also associated with the likelihood of placement (Rossi et al., 1999; Westad & McConnell, 2012). Race has a strong association with placement, though the nature of the association is varied. Although one study found that, adjusting for a number of case, organizational, and worker characteristics, African-American (and Mexican) ethnic backgrounds were protective against placement (Graham et al., 2015), studies have typically found higher rates of placement among African-American children than White children (Putnam-Hornstein et al., 2013; Wulczyn et al., 2007; Wulczyn & Lery, 2007).

Re-Referrals. In California, the risk assessment is used to assess risk of future abuse or neglect. A variety of empirical studies has examined predictors of re-referral, primarily among children who were not placed out of home in response to the initial referral—as is the case in the present study. Unlike the present study, which distinguishes between re-referrals reported within 30 days of the initial and those reported thereafter, most of these studies examined re-referral risk irrespective of the time since the initial referral, the disposition of the initial referral, or the services associated with the initial referral. To cast a broad net in terms of plausible adjustment variables, the present analysis considers findings from each of these studies.

Many referral characteristics are associated with increased likelihood of re-referral; these include physical or sexual abuse allegations (R. Thompson & Wiley, 2009), though one study found likelihood to be highest among those with neglect allegations (Eastman et al., 2016). Allegation substantiation (Putnam-Hornstein et al., 2015), a greater number of maltreatment victims (Marshall & English, 1999), and maltreatment chronicity increase risk (English et al., 1999), with prior reports of maltreatment more than doubling risk (Dorsey et al., 2008). A

parent's own history of childhood maltreatment increases re-referral risk, by some estimates as much as triple that of parents with no history of childhood maltreatment (Dorsey et al., 2008; English et al., 1999). Though some have identified parent mental health and substance use problems as predictors of re-referral (English et al., 1999), others have found no association between these characteristics and re-referral (R. Thompson & Wiley, 2009). Caregiver high school completion appears to decrease re-referral risk (R. Thompson & Wiley, 2009). Younger children and children with developmental disabilities or health conditions are also at higher risk of re-referral (Eastman et al., 2016; English et al., 1999; Marshall & English, 1999). Interestingly, one study found that, among non-placed infants, those with substantiated allegations who received in-home services were more likely to be re-referred than those with unfounded allegations (Putnam-Hornstein et al., 2015). This finding suggests that workers deliver in-home services to only the most high-risk children—those whose likelihood of re-referral may be high even after service delivery.

The Present Study

Chapters 1 and 2 examined in depth why parental mental health problems and substance use are associated with increased risk of "unsafe" safety decisions and how family protective factors may mitigate this risk. The present study situates the safety decision within the broader scope of child welfare trajectories, treating it as a critical juncture that, along with parental mental health problems and substance abuse, is likely associated with allegation substantiation, case openings (including family maintenance and/or placements), and re-referrals. Furthermore, the study examines the question of whether the interaction between parental mental health problems, substance abuse, and safety decision accounts better for the likelihood of each outcome than the sum of their individual effects. The study also improves on similar prior studies (e.g., Westad & McConnell, 2012), which treated child welfare outcomes involving this population as independent events. The present study examines the effects of parental mental health problems and substance abuse on child welfare outcomes conditional on other decisions made during the investigation.

Hypothesis 1: Re-Assessments

We hypothesize that households affected by parental mental health problems or substance abuse will have more iterative investigative documentation than comparison households, and will be more likely to have initial safety decisions changed from "safe" to "safe with plan," from "safe"/"safe with plan" to "unsafe," or from "safe" to "unsafe."

Hypothesis 2: Main Effects

With respect to the study's main outcomes, we hypothesize that parental mental health problems and substance abuse will increase the likelihood of substantiation and case opening (both family maintenance services and placement), but not of re-referral. We hypothesize the latter because if households affected by parental mental health problems and substance abuse are more likely to receive needed services, they may be less likely to experience re-referral.

Hypothesis 3: Interactive Effects

We hypothesize that the effects of parental mental health problems and substance abuse on likelihood of substantiation, family maintenance services, and placement will be:

a. Largest when the safety decision is "safe with plan," because this decision is based not only on the presence or absence of safety threats, but also on the balance of other relevant household characteristics; we suspect that parental mental health problems and substance abuse are two such characteristics.

b. Smallest when the safety decision is "unsafe," because the likelihood of each outcome is already highly (though not completely) determined by an "unsafe" decision, leaving little variance left to explain by other factors such as parental mental health problems or substance abuse.

Findings from the study will provide a clearer picture of what happens after the investigation of maltreatment referrals involving parental mental health problems or substance abuse in relation to the safety decision. A better understanding of what happens to households in which parents are affected by these issues may help guide efforts to prevent more serious or recurrent child welfare involvement in this population.

3.2. Methods

Study Context

Investigation of child welfare outcomes was performed on child maltreatment referrals and investigations conducted by San Francisco's public child welfare department, Family and Children's Services (FCS), within the City and County of San Francisco Human Services Agency. The agency uses the SDM decision-making processes for child maltreatment screening, investigation, case opening, and out-of-home placement. About half of maltreatment referrals screened by FCS hotline workers in San Francisco County are investigated each year.

In each investigation, workers first use the SDM safety assessment tool to investigate reports of maltreatment, including evaluation of current threats to child safety, protective factors, and safety interventions. If workers document one or more current threats to child safety using the safety assessment, they must complete the SDM risk assessment within 30 days. This tool serves two important functions. First, it assesses risk of future maltreatment based on scores calculated from an inventory of abuse and neglect risk factors, wherein higher scores denote higher risk of maltreatment. Second, it helps determine whether a referral should be promoted to a case, based on inventories of abuse and neglect risk factors.

If the referral is promoted to a case, families may receive in-home child welfare services (sometimes voluntarily, though more frequently mandated by the courts) or, when current threats to child safety require child placement, out-of-home services (NCCD, 2015). For investigations in which workers document no current safety threats on the safety assessment, SDM recommends that workers complete the risk assessment, though this is not required.

Sample

In order to inform early assessment and intervention for child welfare-involved households affected by parental mental health problems and substance abuse, the analysis is limited to households investigated for maltreatment in which parents have no history of FCS involvement in California. (Some children in these households have histories of maltreatment referral even though their parents do not, a factor which is taken into account in all analyses). We also limited the sample to households in which workers administered both the safety and risk assessment. This sampling criterion was required because some analysis variables (e.g., current threats to child safety) are documented on the safety assessment, whereas others (e.g., parental mental health and substance use, neglect and abuse risk inventories) are documented on the risk assessment. Lastly, the majority of FCS's maltreatment investigations used Version 2 of the SDM safety assessment, which was in use from 2007 to 2015, when it was replaced with Version 3. Substantial differences between versions necessitated that we only sample households investigated using Version 2.

Of all 44,566 unique referrals made during the study window, 38,836 involved households in which a mother and/or father was identified as the alleged abuser (see Figure 3.1).

Of these referrals, 16,163 were first-time referrals for the mother and/or father. Less than half (7,269) received a safety assessment (with the remaining 8,894 being screened out by hotline workers), and 4,261 received both safety and risk assessments. Of those, 3,393 had safety assessments that were administered within 10 days of referral and risk assessments that were administered within 30 days of the safety assessment, per San Francisco policy.

Many of the 4,261 households that received both safety and risk assessments had safety assessments that were performed outside the required 10-day window; in fact, 681 households received safety assessments between 11 and 30 days following referral. FCS indicated that late safety assessments were common because workers were obligated to copy paper assessments to an electronic record. Late safety assessments were more common during the early implementation of SDM, when staff were unfamiliar with the new paperwork and practices. These late safety assessments were included in the final sample to increase statistical power and so that inferences would be more generalizable; thus the final sample consisted of 4,072 households with safety assessments performed within 30 days of referral, and risk assessments performed within 30 days of safety assessments. Table A1 shows that the safety assessment's timeliness had minimal effect on the association between mental health/substance abuse status and any of the outcomes of interest, and thus did not meet criteria as a confounder per Jewell (2004). Thirty-five percent (n=1,420) of safety assessments received required risk assessments because of the documentation of at least one safety threat. Among these households, the mean number of safety threats was 1.68 (sd=1.13). The remaining 65% (n=2,651) of safety assessments had no documented safety threats but received recommended risk assessments at the worker's discretion.

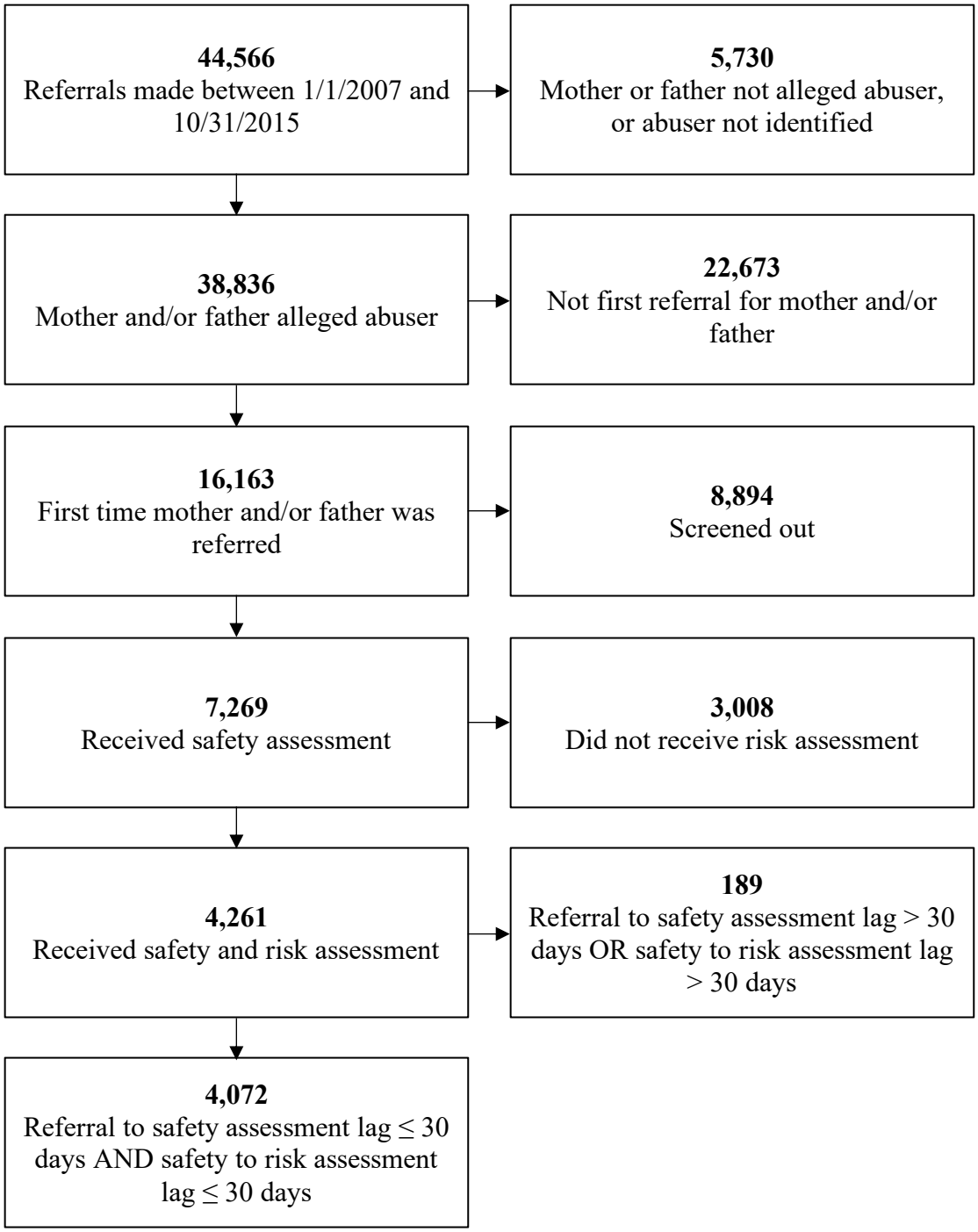

Figure 3.1. Data merge and sample selection procedure.

Measures

The California Structured Decision-Making Model. The California SDM model helps workers make critical decisions throughout the maltreatment referral process, including the decision to investigate a referral, promote a referral to a case, place a child out of the home, and reunify families after placement (NCCD, 2015). Decision-making guidance is standardized in the form of a suite of SDM tools that help determine next steps (e.g., whether to investigate or

"screen out" a new referral). The SDM model is widely used both nationally and internationally (CDSS, n.d.).

The psychometric literature, though limited, suggests that the SDM risk assessment has good predictive validity, based on studies of 6- and 24-month maltreatment recurrence rates (Johnson, 2004). The same study also reports high correlation between the safety and risk assessments (Johnson, 2004, p. $r=0.50$, $p<0.005$). SDM has been examined in at least one study of child welfare decision-making processes and outcomes. Investigators in Michigan conducted a pilot study of the SDM system involving almost 2,000 families in 13 counties. Counties implementing SDM were compared to matched counties implementing treatment as usual, and child welfare outcomes were tracked for a 12-month follow-up period (Baird et al., 1995). SDM practices were associated with higher service provision rates among clients with open cases, fewer re-referrals among clients who were not opened to services, and fewer new substantiations and placements overall during the follow-up period.

However, actuarial tools such as the SDM have not gone without criticism. Studies of similar tools have found that workers often inflate scores in order to achieve desired outcomes (Lyle & Graham, 2000), and studies of SDM itself suggest that many workers find the tools undermine development of professional expertise, that they tend to be an afterthought in the actual decision-making process, and that they tend to be viewed as merely an accountability mechanism (Gillingham, 2011; Gillingham & Humphreys, 2009).

SDM Safety Assessment. Workers complete the SDM safety assessment for all referrals screened in for investigation by FCS hotline workers. The safety assessment helps workers determine a child's level of safety in the home during the investigation (safe, safe with plan, or unsafe), and the final disposition of each maltreatment allegation on the referral (substantiated, inconclusive, or unfounded). The assessment evaluates five child risk factors, 13 current threats to child safety, 11 family protective factors, and eight safety interventions. All are dichotomously indicated (0=No, 1=Yes).

A number of analysis variables were extracted from the safety assessment based on the literature review and previous analyses of these data that examine SDM investigation outcomes (chapters 1 and 2). Given that the literature review implicated child capacity issues in risk of all four outcomes of interest, the developmental problems, medical/mental problems, and physical problems variables were extracted from the child vulnerabilities inventory for analysis. There are two other child vulnerability indicators. Child age is incorporated into the analysis vis-à-vis a child age categorical variable described below. No studies in the literature search identified the remaining child vulnerability ("school age, but not attending") as a risk factor for the child welfare outcomes examined in the analysis.

SDM Risk Assessment. SDM instructs workers to complete the risk assessment if at least one threat to child safety is identified on the safety assessment (though a supervisor can override this instruction if necessary). When no threats are identified, SDM still recommends that workers complete the risk assessment. Workers use the risk assessment to evaluate risk of future child safety threats, and the evaluation also determines if a case should be opened. The assessment evaluates 12 neglect risk factors and 11 abuse risk factors, including parental mental illness and substance abuse. SDM defines mental illness based on the presence of one or more of the following: (1) psychiatric diagnosis made by a mental health professional, (2) repeated referrals for psychiatric evaluation, or (3) recommended or completed psychiatric hospitalization. Workers must specify if mental illness criteria are met currently (i.e., within 12 months of referral), or by history (i.e., prior to 12 months before referral; NCCD, 2015, p. 79). We hereafter

use the term “mental health problems” when referring to this SDM construct, because SDM mental illness criteria are not intended as a replacement for a psychiatric assessment.

Workers check the substance use indicator if alcohol and/or drug use interferes with household functioning, as demonstrated by: (1) employment, family, or legal problems, or the inability to protect, supervise, or care for the child, (2) DUI or refusal to accept breathalyzer test within two years, (3) a self-report of substance use problems, (4) current or past substance use treatment, (5) repeated positive urine screens, (6) medically induced substance use problems, or (7) a drug-exposed infant or child with fetal alcohol syndrome (NCCD, 2015, p. 79). Workers specify if substance abuse criteria are met currently (i.e., within 12 months of referral), and/or by history (i.e., prior to 12 months before referral).

For the purposes of the present analysis, households were divided into three exposure groups: (1) current mental health problems only (MH), (2) current substance abuse only (SA), and (3) current co-occurring mental health problems and substance abuse (MHSA) a categorical exposure dummy variable was derived, with the reference group being parents without current MH or SA. (Note that the reference group may include parents with a history of mental health problems or a history of substance abuse.)

Lastly, the analysis included the risk assessment’s neglect and abuse risk scores, which are weighted sums of the individual items in the corresponding neglect and abuse risk inventories. These were included to examine risk of future harm, a variable that was identified in the literature search as a predictor of substantiation. Additionally, SDM uses these scores to make case opening determinations, necessitating their inclusion in the analysis. Several variables identified by the literature as predictors of case opening, placement, or re-referral are assessed in the neglect and abuse risk inventories: parent arrest history, parent childhood history of maltreatment, housing issues. Each of these was included individually in the analysis as a dichotomous variable (0=No, 1=Yes).

Referral, Case, and Placement Records. Data from SDM safety and risk assessments were merged with FCS’s referral, case, and placement administrative records from CWS/CMS, California’s child welfare case management system, using unique identifiers in order to link investigation information to maltreatment allegation dispositions, case openings, and placements information. Referral records also contained demographic information, including child age and race, as well as information about the origin of the maltreatment referral, including reporter type.

A number of analysis variables were extracted from these records. These included reporter identity (collapsed into mandated versus non-mandated), total number of allegations, total number of children, age of youngest child, and race of children in the household. A categorical age variable was derived based on the age of the youngest child, per findings from the literature search. The derived variable had three categories: (1) youngest child six years old or older (2) youngest child between ages two and five, and (3) youngest child age one or younger.

The categorical child race variable indicated a single race (“White”, “Hispanic”, “Asian”, or “Black/African American”) when all children in the household were documented as being of the same race. When children were of different races, race was coded as “Mixed.” Because very few children were identified as Native American, they were aggregated under the “Mixed” category.

In order to examine allegation type, dichotomous variables (0=No, 1=Yes) were derived from the referral data to indicate whether each of the following maltreatment types was alleged

for any children in the household: substantial risk, sibling abused, sexual abuse, severe neglect, physical abuse, general neglect, exploitation, emotional abuse, or caregiver absence/incapacity.

The analysis outcomes were derived from referral, case, and placement records, as well as from the SDM data. For re-assessments, a dichotomous outcome variable was derived that indicated if the household was re-assessed using the safety assessment within 30 days of referral (0=No, 1=Yes). Categorical variables were also derived to indicate the safety decision rendered on each re-assessment.

For the substantiations outcome, a dichotomous variable was derived that indicated if any allegations were substantiated for the household (0=No, 1=Yes). Three outcomes variables were used to examine case openings: a household maintenance variable (in-home case), a placement variable (out-of-home case), and an overall case openings variable. For household maintenance, a dichotomous outcome variable was derived that indicated if a household maintenance case was opened for any child in the household within 30 days of referral (0=No, 1=Yes). For placements, a dichotomous outcome variable was derived that indicated if any child in the household was placed out-of-home within 30 days of referral and for a length of stay that was equal to or greater than eight days (0=No, 1=Yes). The threshold of eight days was used in order to differentiate children who only needed short-term intervention from children for whom placement was an intensive intervention (D. Thompson, personal communication, March 2, 2020). For overall case openings, a dichotomous outcome variable was derived that indicated if any household maintenance cases were opened or if any child was placed out-of-home, per the above criteria (0=No, 1=Yes).

For re-referrals, a dichotomous outcome variable was derived that indicated if any parent in the household was re-referred between 31 and 365 days following initial referral. A 12-month re-referral window is consistent with federal child welfare measures. Following procedures used in other re-referral analyses (Eastman et al., 2016; Kim et al., 2020; Putnam-Hornstein et al., 2015), we limited the re-referral analysis sample to households that experienced no placements; this is because parents are not at risk of re-referral if children are placed out-of-home. Although the closing date of the initial referral would otherwise be a logical start date for the re-referral window, some households had referral closure dates that were the same as, or only a few days after, the referral date, while others had anomalous referral closure dates that were hundreds of days after the referral date. (FCS's policy is that all referrals must be closed within 30 days.) Thus, we chose to start the re-referral window 31 days following initial referral date, and we considered referrals made prior to the start of this window examples of the "overlapping" re-referrals discussed above. This ensured a clear distinction between re-referrals that occurred prior to case openings and re-referrals that occurred thereafter and are likely to indicate fresh incidents of maltreatment. A dichotomous outcome variable was derived that indicated if one or more of these re-referral allegations was substantiated.

Analysis

Re-Assessments. The proportion of re-assessed households was examined by exposure group, and a chi-square test examined whether the relationship between exposure group and re-assessment was significant. Among households that were re-assessed at least once with the safety assessment, each household's initial decision was compared to its final decision, and these initial/final decision combinations were examined by exposure group. This analysis was used to test hypothesis 1. Subsequently, only each household's final safety decision was used in analyses.

Descriptive Analysis - Exposure Group, Safety Decision, and Outcomes. Descriptive statistics examined the association between exposure group and safety decision, and the association between exposure group and each outcome, by safety decision. Chi-square tests were examined in each instance to determine whether associations between variables were significant.

Unconditional Analysis. To support descriptive findings, an unconditional logistic regression model was constructed to examine the association between the categorical exposure factor variable and odds of each outcome (substantiations, any case openings, household maintenance, placement, and re-referral). This set of models was also measured for each safety decision sub-group ("safe", "safe with plan", and "unsafe") in order to more easily visualize differences in the effect of exposure by safety decision.

Bivariate Analysis of Adjustment Variables. Next, associations between proposed adjustment variables and each outcome were examined. The literature indicates that many of these adjustment variables increase likelihood of more than one outcome. In order to avoid the possibility of overlooking a significant association, the analysis proceeded in an exploratory fashion by examining all possible associations between adjustment variables and outcomes. The list of adjustment variables also included the indicator for any substantiations; however, because this variable is also an outcome, it was naturally omitted from the set of models that examined likelihood of substantiation. For the re-referral models, the other four outcome variables (any substantiations, any case openings, any household maintenance, and any placements) were also tested as adjustment variables.

A series of bivariate logistic regression models was constructed using each adjustment variable individually as the sole independent variable. Due to the exploratory nature of this multiple testing procedure, the type 1 error rate was adjusted for multiple testing bias. The Benjamini and Hochberg (1995) approach was used, because it is a more lenient alternative to the traditional Bonferroni correction. This retains a larger pool of potential variables for examination in the adjusted analysis while still controlling the false discovery rate.

Adjusted Analysis. In the adjusted analysis, a series of models was measured for each outcome. For substantiations, two models were measured. The first model measured the main effects of safety decision and exposure on the odds of substantiation, adjusting for all variables that met the Benjamini-Hochberg-corrected significance threshold in bivariate analysis (hypothesis 2). The second model added the interaction between safety decision and exposure to the first model (hypothesis 3). A likelihood ratio test examined whether the inclusion of the interaction terms significantly reduced the amount of unexplained variance.

For case openings, household maintenance, placements, and re-referrals, three models were measured. The first model measured the main effects of safety decision and exposure on the odds of the outcome (hypothesis 2), adjusting for all variables that met the Benjamini-Hochberg-corrected significance threshold in bivariate analysis except those that occurred temporally after the safety decision (i.e., the indicator for any substantiations). The second model added the interaction between safety decision and exposure to the first model (hypothesis 3). Note that the indicator for any substantiations was omitted from the first and second models because it likely functions as an intermediate variable between safety decision and the outcome, and may therefore block the effect of safety decision; omitting it from the first two models helps obtain overall estimates of the main and interactive effects of safety decision and exposure on the outcome. A likelihood ratio test of the first and second models examined whether the inclusion of the interaction terms significantly reduced the amount of unexplained variance. The third model added the indicator for any substantiations to the second model.

For re-referrals, the same set of three models was measured. For the same rationale discussed above, two adjustment variables needed to be omitted from the first and second models: any substantiations and household maintenance. These were subsequently included in the third model. As above, a likelihood ratio test of the first and second models examined whether the inclusion of the interaction terms significantly reduced the amount of unexplained variance.

For each outcome's final model, post-estimation pairwise comparisons were measured to further examine whether the effects of each exposure group on the outcome depended on safety decision. To adjust for multiple testing, a Bonferroni-corrected significance level of 0.0008 was applied to these comparisons.

3.3. Results

Descriptive Statistics

Table 3.1 displays descriptive statistics for the analysis sample. Eighty percent of households had a primary caregiver parent without MH or SA, 6% had a parent with MH, 10% had a primary caregiver parent with SA, and 5% had a parent with MHSA. Referrals were received from mandated reporters most of the time (84% overall). Overall, each referral reported a mean of 1.54 children, with 27% of all referrals reporting at least one infant. The most common child race was Hispanic, both overall (35%) and also for households with no MH or SA, MH, and SA; the most common child race in MHSA households was White (36%).

In general, descriptive statistics show that risk tended to be lowest in households with no MH or SA, higher in SA households than in MH households, and highest in MHSA households. This finding holds for numerous analysis variables, including child age, arrest history, parent childhood history of maltreatment, housing issues, and many others. In notable cases, this trend is reversed. For instance, overall, 16% of households had any child with a history of referral; by exposure, this proportion was highest among households with no MH or SA (18%) and lowest among MHSA households (7%). A similar trend is seen with both physical and sexual abuse allegations.

Table 3.1
Descriptive Statistics

	Overall	No Mental Health Problems or Substance Abuse	Mental Health Problems Only	Substance Abuse Only	Mental Health Problems & Substance Abuse
Mandated reporter (%)	84	83	86	84	86
Total children	1.54 (0.85), 1	1.59 (0.87), 1	1.42 (0.77), 1	1.37 (0.70), 1	1.23 (0.89), 1
Youngest child (%)					
0-1	27	20	44	58	70
2-5	24	25	27	19	17
>= 6	48	55	29	23	14
Child race (%)					
Hispanic	35	36	31	32	28
Black/African American	24	23	24	31	30
Asian	19	21	18	6	4
White	16	13	22	28	36
Mixed	1	1	2	2	1
Child referral history (%)	16	18	12	8	7
Child capacity problems (%)					
Medical/mental	4	3	7	3	7
Developmental	2	2	3	3	7
Physical	1	< 1	2	3	6
Parent arrest history (%)	13	7	16	42	57
Parent childhood maltx (%)	18	13	31	33	57
Housing issues (%)	10	5	20	27	52
Total allegations	1.51 (0.79), 1	1.49 (0.77), 1	1.61 (0.77), 1	1.56 (0.86), 1	1.62 (0.88), 1
Allegation type (%)					
Physical abuse	46	53	28	15	13
General Neglect	43	37	53	74	74

Emotional Abuse	26	26	35	23	24
Sibling Abused	17	20	8	6	4
Absence/Incapacity	9	7	22	14	18
Sexual Abuse	6	7	3	2	2
Substantial Risk	3	3	5	6	3
Severe Neglect	2	2	3	5	4
Exploitation	< 1	< 1	0	0	0
Neglect risk score	1.75 (2.91), 1	0.87 (2.1), 0	3.41 (2.63), 3	5.30 (2.80), 5	7.38 (2.79), 7
Abuse risk score	0.72 (1.52), 0	0.56 (1.38), 0	1.79 (1.79), 1	0.79 (1.69), 0	2.03 (1.79), 2
Any substantiations	32	23	54	72	87
Any case openings	23	13	52	62	80
Any household maintenance	13	9	32	26	24
Any placements	12	5	25	39	58
Any re-referrals	19	18	20	27	35

Note. mean (sd), median, unless otherwise specified

Re-Assessments

Overall, 8% of households (n=326) were re-assessed using the safety assessment within 30 days of initial referral. In terms of exposure group, MHSA households were the most likely to be re-assessed (17%), followed by MH households (14%), SA households (12%). Households with no MH or SA were the least likely to be re-assessed (7%). Chi-square testing indicated that the relationship between exposure group and re-assessment was significant (chi2[3]=50.44, $p \leq 0.0001$). In terms of initial safety decision, "safe with plan" households were most likely to be re-assessed (20%), followed by "unsafe" households (11%), and safe households (3%). Chi-square testing indicated that the relationship between initial safety decision and re-assessment was significant (chi2[3]=261.09, $p \leq 0.0001$).

The final re-assessment safety decision was sometimes the same as the initial safety decision, but not always. Figure 3.2 shows that the three most common initial→final decision combinations overall were "safe with plan"→"safe" (36%), "safe"→"safe" (16%), and "safe with plan"→"safe with plan" (13%). These were also the three most common combinations among households with no MH or SA (39%, 22%, and 13%, respectively). Among MH households, the three most common combinations were "safe with plan"→"safe" (34%), "safe with plan"→"unsafe" (17%), and "unsafe"→"safe" (14%). Among SA households, the three most common combinations were "safe with plan"→"safe" (40%), "safe with plan"→"safe with plan" (17%), and "unsafe"→"unsafe" (13%). Among MHSA households, the three most common combinations were "safe with plan"→"unsafe" (42%), "safe with plan"→"safe with plan" and "safe with plan"→"safe" (both 13%), and "safe"→"safe with plan" and "unsafe"→"unsafe" (both 10%).

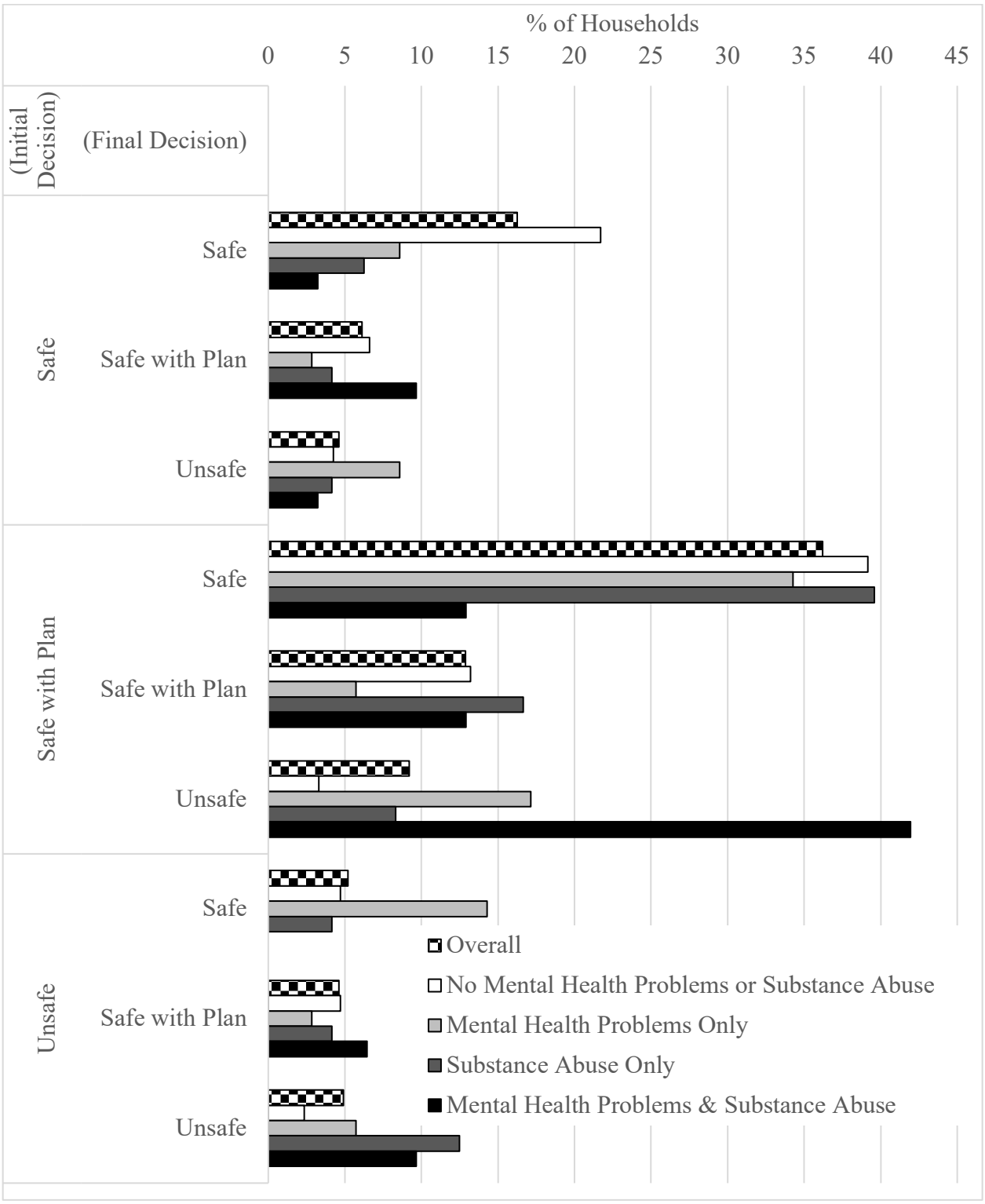

Figure 3.2. Initial and Final Safety Decisions among Re-Assessed Households.

Chi-square testing indicated that the relationship between exposure group and initial-final decision combination was significant (chi2[3]=85.96, $p \leq 0.0001$). Results indicate that households were most often re-assessed when their initial safety decision was "safe with plan,"

suggesting that workers tend to decide "safe with plan" in households with more dynamic family circumstances, or perhaps households in which investigative information is more difficult to obtain. For all but MHSA households, the initial "safe with plan" decision was most often changed to "safe;" for MHSA households, it was most often changed to "unsafe."

Another complicating scenario mentioned above was that some children were re-referred within a short time following initial maltreatment referral, a scenario that could result in a safety decision that differed from that associated with the initial referral. In the present sample, 4% (n=169) of initial referrals involved children who were subsequently re-referred within 30 days. There was no significant association between exposure and re-referral within 30 days.

Final Safety Decisions

Figure 3.3 shows that 65% of households overall were determined "safe," 24% were determined "safe with plan" and 11% were determined unsafe. Chi-square testing indicated that the relationship between exposure group and safety decision was significant (chi2[6]=920.02, $p \leq 0.0001$). Households with no MH or SA were the most likely to be determined safe (75%), and the least likely to be determined "safe with plan" (21%) or "unsafe" (5%). MHSA households were the most likely to be determined "unsafe" and the least likely to be determined "safe" (11%). "Safe with plan" decisions were equally common among MHSA and MH households (39% each), and only slightly less common among SA households (35%). Follow-up testing showed that among households with at least one safety threat (n=1,420), MHSA households were the most likely to be determined "unsafe" versus "safe with plan" (56%), followed by SA (51%), MH (39%), and households with no MH or SA (20%). Chi-square testing indicated these associations were significant (chi2[6]=149.96, $p \leq 0.0001$).

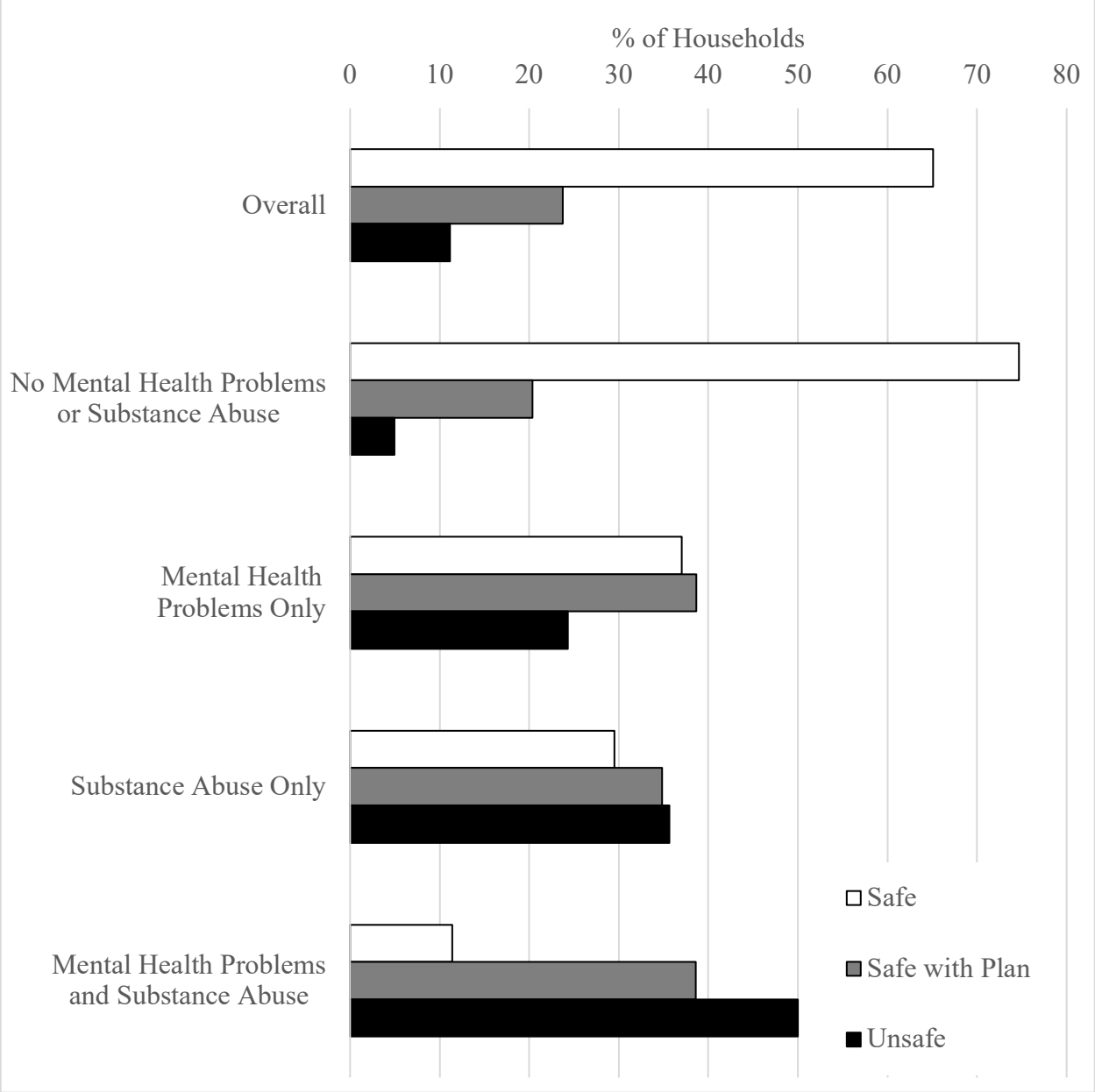

Figure 3.3. Safety Decision by Exposure Group.

Safety Decisions and Outcomes – Descriptive Statistics

Table 3.2 shows the proportion of households that experienced each child welfare outcome, by final safety decision and exposure group. Thirty-two percent of all households had at least one substantiated allegation, 23% had a case opening, 13% received family maintenance services, 12% had at least one child placed out-of-home for eight or more days, and 19% were re-referred within twelve months. The likelihood of substantiation, case opening, and placement tended to increase with safety decision severity ("safe," "safe with plan," "unsafe"), whereas in the cases of family maintenance and re-referral, "safe with plan" households were most likely to experience the outcome.

With some exceptions, the likelihood of each outcome also tended to be lowest among households with no MH or SA, higher among SA households than MH households, and highest among MHSA households, both overall and by safety decision. These increases in likelihood tended to be the most dramatic among "safe" households and least dramatic among "unsafe" households. Across all exposure groups, likelihood of family maintenance services was highest among "safe with plan" households. Re-referral likelihood among households with no placements was lowest in households with no MH or SA, higher among SA households than MH households, and highest among MHSA households overall and when the decision was "safe," but not when the decision was "safe with plan" or "unsafe". The latter finding is difficult to interpret due to small sample size, however; few households without placements had "unsafe" decisions.

Table 3.2

Percent of Households Experiencing each Child Welfare Outcome, by Safety Decision and Exposure Group

	Overall (%)	No Mental Health Problems or Substance Abuse (%)	Mental Health Problems Only (%)	Substance Abuse Only (%)	Mental Health Problems and Substance Abuse (%)
Any Substantiations					
Overall	32	23	54	72	87
Safe	13	11	27	35	38
Safe with Plan	57	51	53	79	81
Unsafe	98	94	98	99	100
Any Case Openings					
Overall	23	13	52	62	80
Safe	6	4	22	21	38
Safe with Plan	40	29	59	66	71
Unsafe	92	88	92	96	93
Any Family Maintenance					
Overall	13	9	32	26	24
Safe	5	4	19	17	38
Safe with Plan	35	27	57	53	53
Unsafe	15	20	22	12	5
Any Placements (8 or more days)					
Overall	12	5	25	39	58
Safe	1	1	6	5	0
Safe with Plan	7	4	6	16	19
Unsafe	85	79	81	90	91
Any Re-Referrals within 12 Months					
Overall	19	18	20	27	35
Safe	19	18	24	29	43

Safe with Plan	21	20	16	25	38
Unsafe	12	9	17	21	0

Notes. Percentages indicate joint probabilities of safety decision and exposure group; re-referral percentages include only households with no placements.

It is important to note several atypical scenarios in this descriptive analysis (see Table 3.3). The first is that 371 "safe" households had at least one substantiated allegation, even though no threats were noted on the safety assessment. A 10% random sample of these households was selected and their records were reviewed individually. This examination indicated that most often, no further information was available to indicate why substantiation occurred following a "safe" decision (89% of the random sample). Occasionally, a household's initial "unsafe" decision was updated to "safe" following an immediate placement, which would explain why allegation(s) were substantiated (5%). FCS staff indicated that when "safe" households have an allegation substantiated, it is usually because investigative work performed subsequent to the safety assessment revealed new or clearer evidence of maltreatment that resulted in substantiation.

A number of "safe" households (n=146) had a family maintenance case opened within 30 days of referral. A 10% random sample of these households was selected and their records were reviewed individually. This examination found that in 57% of these households, a family maintenance was opened following the substantiation of at least allegation. (In fact, 69% of the entire sample of n=146 households had an least one substantiation upon further examination). In the remaining households, however, a family maintenance case was opened despite a "safe" decision and no substantiated allegations. FCS staff indicated that the latter situation may occur when a parent voluntarily accepts family maintenance services, and/or when a worker believes that children are at risk of future maltreatment.

Twenty-eight "safe" households experienced placements within 30 days of referral, an atypical scenario that had three main explanations after each household's records were reviewed individually. Most commonly (39%), a new referral was reported immediately following the initial referral, and this new referral had an associated "unsafe" decision which triggered placement. In 36% of households, at least one allegation was substantiated, suggesting that threats to child safety not recorded on the safety assessment were subsequently documented (as described above) and this triggered placement. Less often (18%) "safe" households experienced placements even when no allegations were substantiated, with no further information to indicate why.

Another atypical scenario occurred when "unsafe" households had no placements within 30 days of referral (n=68). A review of each household's records found that most often (37%), this was because the household experienced a placement fewer than eight days in duration (the threshold used in this analysis). In 24% of households, family maintenance services were initiated instead of placement. In 22% of households, no child was placed, even though the decision was "unsafe" and at least one allegation was substantiated. FCS staff indicated that the latter scenario tends to occur when a child determined unsafe in the home is released to another family member prior to a case being open.

In terms of child safety, two of the above atypical scenarios stand out: (1) "safe" households that experienced placements and (2) "unsafe" households that experienced no placements (as defined by this study). These safety decision-placement "mismatches" were less common among households with no MH or SA (2%) than among households with MH (9%), SA (10%), or MHSA (11%). The relationship between exposure group and safety decision-placement "mismatch" was significant (chi2[3]=104.76, $p \leq 0.0001$). Taken together with findings from the re-assessments analysis, this finding further supports the notion that MH, SA, and MHSA households are marked by dynamic circumstances that have unpredictable effects on assessments of child safety and on service provision following safety assessment.

Table 3.3
Atypical Child Welfare Outcome Scenarios

Atypical Scenario	Description	%
"Safe" and Substantiated Allegation(s)		100
	"Safe" and substantiated allegation(s), no other info	89
	"Safe" and "safe with plan" decisions rendered the same day	5
	Decision updated from "unsafe" to "safe" after initial placement	5
"Safe" and Family Maintenance Services		100
	"Safe" and substantiated allegations	57
	"Safe" and no substantiated allegations	43
"Safe" and Placement		100
	"Safe", re-referred immediately, determined "unsafe", placement	39
	"Safe", allegation(s) substantiated, placement	36
	"Safe", no substantiated allegations, placement	18
	Decision updated from "safe" to "unsafe" > 30 days post-referral	4
	Decision updated from "unsafe" to "safe" after initial placement	4
"Unsafe" and No Placement		100
	"Unsafe", placement fewer than eight days	37
	"Unsafe", family maintenance services initiated	24
	"Unsafe", substantiated allegation(s), but no placement	22
	"Unsafe", placement began > 30 days post-referral	7
	"Unsafe", no substantiated allegations	6
	"Unsafe", open placement	3
	"Safe" and "unsafe" decisions rendered the same day	1

Unconditional Analysis

Results from unconditional logistic regression models generally supported descriptive findings (see Table 3.4). In the overall models, the odds of every outcome except re-referral were higher for MH, SA, and MHSA households than for households with no MH or SA—with the exception that MH households were no more likely to be re-referred than households with no MH or SA. For substantiations, case openings, placements, and re-referrals, the odds were higher in SA than in MH households, and highest in MHSA households; for family maintenance, however, the odds were highest in MH households, and similar in SA and MHSA households.

"Safe" Households. Differences by exposure group in the likelihood of each outcome appeared to depend on safety decision. Among "safe" households, risk of each outcome was universally higher in MH, SA, and MHSA households than among comparison households, with the exception that the odds of re-referral among MH households were marginally significant higher (OR=1.48, p=0.10) . Note that the coefficient associated with the regression of placement on MHSA was not estimable; this is because no "safe" MHSA households experienced placements.

"Safe with Plan" Households. Among "safe with plan" households, the odds of each outcome were significantly higher in MH, SA, and MHSA households than in comparison households, with several exceptions. MH households were no more likely to experience substantiation (OR=1.11, p=0.67) placements (OR=1.50, p=0.42), or re-referral (OR=0.77, p=0.42) than comparison households. Likelihood of re-referral was also non-significantly higher in SA versus comparison households (OR=1.38, p=0.20). In general, risk differences by exposure group were less dramatic in "safe with plan" households than in "safe" households.

"Unsafe" Households. Among "unsafe" households and compared to households with no MH or SA, the odds of substantiation were non-significantly higher among MH households (OR=3.83, p=0.21) and significantly higher among SA households (OR=8.57, $p\leq$0.05). The coefficient associated with the regression of substantiation on MHSA was not estimable because all "unsafe" MHSA households experienced substantiations.

In terms of case openings among "unsafe" households, the odds were higher among SA households (OR=3.77, $p\leq$0.01) than comparison households, but they were non-significantly higher in MH (OR=1.62, p=0.36) and MHSA households (OR=1.91, p=0.16). Relative to comparison households, MH households were no more likely to have family maintenance services (OR=1.09, p=0.80) or placements (OR=1.15, p=0.70). SA households were marginally significantly less likely to have family maintenance services (OR=0.53, $p\leq$0.10) and significantly more likely to have placements (OR=2.43, $p\leq$0.01). Similarly, SA households were significantly less likely to have family maintenance services (OR=0.20, $p\leq$0.001) and significantly more likely to have placements (OR=2.81, $p\leq$0.01).

In terms of re-referrals among households with no placements, the ORs associated with MH and SA were non-significant, and the OR associated with MHSA was not estimable because none of the nine "unsafe" MHSA households was re-referred within twelve months.

Taken together, results suggest that all three exposure groups had almost universally higher likelihood of every outcome relative to comparison households, though this finding was mainly true among "safe"—and to a lesser extent, "safe with plan"—households. The finding did hold for "unsafe" households; namely, for SA and MHSA households, the likelihood of family maintenance services was lower and the likelihood of placement higher. This suggests that when workers believe a child is unsafe in the home, they are more likely to initiate family maintenance

services instead of placement for households without MH or SA, and more likely to initiate placement instead of family maintenance services for households with SA or MHSA.

Table 3.4

Unconditional Associations Between Exposure Group and Outcome Risk, by Safety Decision

	Overall		Safe		Safe with Plan		Unsafe	
	OR	95% CI	*OR*	95% CI	*OR*	95% CI	*OR*	95% CI
Any Substantiations								
MH	3.97***	(3.06, 5.16)	2.90***	(1.86, 4.53)	1.11	(0.69, 1.76)	3.83	(0.48, 30.88)
SA	8.56***	(6.77, 10.81)	4.21***	(2.89, 6.14)	3.63***	(2.27, 5.81)	8.57*	(1.07, 68.55)
MHSA	22.74***	(14.69, 35.20)	4.74***	(1.95, 11.54)	4.26***	(2.17, 8.37)	-	-
Intercept	0.29***	(0.27, 0.32)	0.13***	(0.11, 0.15)	1.02	(0.87, 1.20)	16.44***	(8.39, 32.23)
Any Case Openings								
MH	7.20***	(5.51, 9.41)	6.05***	(3.67, 9.98)	3.52***	(2.18, 5.67)	1.62	(0.58, 4.56)
SA	10.86***	(8.64, 13.63)	5.83***	(3.68, 9.22)	4.72***	(3.10, 7.18)	3.77**	(1.37, 10.39)
MHSA	26.62***	(18.30, 38.72)	13.44***	(5.46, 33.11)	5.98***	(3.31, 10.79)	1.91	(0.77, 4.71)
Intercept	0.15***	(0.13, 0.17)	0.05***	(0.04, 0.06)	0.41***	(0.35, 0.49)	7.26***	(4.50, 11.73)
Any Family Maintenance								
MH	4.82***	(3.60, 6.45)	5.93***	(3.49, 10.05)	3.54***	(2.20, 5.70)	1.09	(0.54, 2.22)
SA	3.61***	(2.79, 4.66)	5.33***	(3.25, 8.74)	2.98***	(1.99, 4.47)	0.53†	(0.28, 1.01)
MHSA	3.24***	(2.26, 4.64)	15.69***	(6.35, 38.76)	2.98***	(1.74, 5.13)	0.20***	(0.07, 0.52)
Intercept	0.10***	(0.09, 0.11)	0.04***	(0.03, 0.05)	0.37***	(0.31, 0.44)	0.26***	(0.17, 0.38)
Any Placements (8 or more days)								
MH	6.25***	(4.51, 8.65)	9.28***	(3.55, 24.21)	1.50	(0.56, 4.04)	1.15	(0.55, 2.41)
SA	11.89***	(9.20, 15.36)	7.31***	(2.81, 18.98)	4.38***	(2.32, 8.25)	2.43**	(1.24, 4.77)
MHSA	25.34***	(18.19, 35.31)	-	-	5.23***	(2.42, 11.26)	2.81**	(1.28, 6.15)
Intercept	0.05***	(0.05, 0.06)	0.01***	(0.00, 0.01)	0.04***	(0.03, 0.07)	3.76***	(2.56, 5.52)
Any Re-Referrals within 12 Months								
MH	1.17	(0.81, 1.68)	1.48†	(0.93, 2.38)	0.77	(0.40, 1.47)	2.00	(0.29, 13.74)
SA	1.71***	(1.27, 2.31)	1.93***	(1.30, 2.87)	1.38	(0.84, 2.27)	2.73	(0.48, 15.59)
MHSA	2.44***	(1.52, 3.92)	3.53**	(1.48, 8.42)	2.45**	(1.32, 4.56)	-	-

Intercept	0.22***	(0.20, 0.24)	0.21***	(0.19, 0.24)	0.24***	(0.20, 0.30)	0.10***	(0.03, 0.33)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; re-referral models include only households with no placements.

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

Bivariate Analysis of Adjustment Variables

Table 3.5 shows that 23 of 25 adjustment variables met or exceeded the Benjamini-Hochberg-corrected significance threshold for substantiation risk. The MHSA category of the exposure factor variable (*OR*=22.74), Housing Issues (*OR*=8.92), and the SA category of the exposure factor variable (*OR*=8.56) were associated with the highest unconditional odds of substantiation. In terms of case openings, 21 of 26 adjustment variables met the significance threshold, with Any Substantiations (*OR*=39.22), the MHSA category of the exposure factor variable (*OR*=26.62), and the SA category of the exposure factor variable (*OR*=10.86) having the three largest effect sizes. Fourteen of 26 adjustment variables were significant in the bivariate Family Maintenance models; the largest effect sizes were associated with Any Substantiations (*OR*=12.93), Substantial Risk (*OR*=8.17), and the MH category of the exposure factor variable (*OR*=4.82). Twenty-one of 26 adjustment variables met the significance threshold for the Placement models. Here too, Any Substantiations (*OR*=68.55) had the largest unconditional effect size, followed by the MHSA category of the exposure factor variable (*OR*=25.34), and Housing Issues (*OR*=12.49). Fourteen of 29 adjustment variables were significant in the bivariate re-referral models. The three largest effect sizes were associated with the MHSA category of the exposure factor variable (*OR*=2.44), the Mixed category of the race factor variable (*OR*=1.76) and the SA category of the exposure factor variable (*OR*=1.71). Similar to previous findings (Putnam-Hornstein et al., 2015), family maintenance was associated with higher odds of re-referral (*OR*=1.38).

Table 3.5

Odds of Child Welfare Outcomes among Parents Investigated for Maltreatment: Bivariate Analysis

	Any Substantiations	Any Case Openings	Any Family Maintenance	Any Placements (8 or more days)	Any Re-Referrals within 12 Months
Exposure					
MH	3.97*	7.20*	4.82*	6.25*	1.17*
SA	8.56*	10.86*	3.61*	11.89*	1.71*
MHSA	22.74*	26.62*	3.24*	25.34*	2.44*
Youngest Child					
0-1	3.33*	4.83*	3.25*	4.30*	1.33*
2-5	1.42*	1.19*	1.44*	0.95*	0.92*
Child Race					
White	1.26*	1.11*	0.89	1.28*	0.79*
Hispanic	1.27*	0.77*	0.89	0.66*	0.75*
Asian	0.65*	0.58*	0.84	0.44*	0.53*
Mixed	1.66*	1.29*	1.02	1.24*	1.76*
Year	1.21*	1.34*	1.28*	1.28*	1.05*
Mandated Reporter	1.50*	1.29	1.39	1.09	0.67*
Total Children	0.88*	0.81*	1.09	0.58*	1.07
Child Referral History	0.71*	0.62*	0.90	0.46*	1.61*
Child Capacity Problems					
Developmental	1.65*	2.41*	0.92	3.42*	1.29
Medical/Mental	1.68*	1.43*	1.29	1.37	1.37
Physical	4.61*	5.89*	1.43	6.56*	1.26
Parent Arrest History	4.32*	5.88*	2.50*	6.17*	1.69*
Parent Childhood Maltreatment	3.49*	4.26*	2.54*	4.20*	1.47*
Housing Issues	8.92*	9.64*	2.08*	12.49*	1.41
Total Allegations	1.56*	1.49*	1.42*	1.37*	1.12
Allegation Type					

Substantial Risk	8.17*	4.49*	8.17*	0.63	1.61*
Sibling Abused	0.63*	0.56*	0.91	0.37*	0.79
Sexual Abuse	0.92	0.79	1.06	0.67	0.84
Severe Neglect	2.71*	1.93*	1.68	1.79*	1.25
Physical abuse	0.40*	0.32*	0.55*	0.25*	0.72*
General Neglect	2.36*	2.83*	2.27*	2.70*	1.37*
Exploitation	1.69	0.95	-	2.10	-
Emotional Abuse	1.16*	0.95	1.36*	0.65*	1.13
Absence/Incapacity	5.35*	4.60*	1.26	7.46*	1.07
Neglect Risk Score	1.38*	1.49*	1.19*	1.48*	1.12*
Abuse Risk Score	1.43*	1.44*	1.32*	1.36*	1.10*
Any Substantiations		39.22*	12.93*	68.55*	1.04
Any Family Maintenance					1.38*

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for race is Black/African American; reference group for age is no child younger than six years old; each variable's estimate measures the unconditional association of that variable with the outcome; re-referral models include only households with no placements.
* *p*-value significant at Benjamini-Hochberg-corrected threshold
- not estimable

Adjusted Analysis

Substantiations. Table 3.6 displays results of the adjusted substantiation models. As expected, in both models, the *OR*s associated with an "unsafe" decision were extreme; it is unlikely that safety threats leading to an "unsafe" decision do not substantiate an allegation. Nonetheless, SA (*OR*=3.81, $p \leq 0.001$) and MHSA households (*OR*=3.01, $p \leq 0.001$) were at more than three times the risk of substantiation even after controlling for the safety decision in model 1. This finding is consistent with hypothesis 2.

Table 3.6
Odds of Substantiation among Households Investigated for Maltreatment: Adjusted Analysis

	Main Effect + All Adjustment Variables		Interaction + All Adjustment Variables	
	OR	95% CI	*OR*	95% CI
Final Decision				
Safe with Plan	5.39***	(0.71, 14.13)	5.74***	(4.51, 7.32)
Unsafe	138.47***	(38.79, 10.88)	93.08***	(41.12, 210.68)
Exposure				
MH	0.77	(0.30, 0.16)	1.05	(0.59, 1.85)
SA	3.81***	(1.02, 5.78)	4.15***	(2.56, 6.72)
MHSA	3.01***	(0.94, 0.98)	1.71	(0.58, 5.02)
Decision x Exposure				
Safe with Plan x MH			0.50†	(0.23, 1.08)
Safe with Plan x SA			0.80	(0.39, 1.60)
Safe with Plan x MHSA			2.16	(0.57, 8.24)
Unsafe x MH			-	-
Unsafe x SA			1.63	(0.18, 14.39)
Unsafe x MHSA			-	-
Youngest Child				
0-1	1.31†	(0.19, 1.93)	1.31†	(1.00, 1.73)
2-5	1.22	(0.16, 1.58)	1.23	(0.95, 1.58)
Child Race				
White	1.34	(0.24, 1.69)	1.35†	(0.95, 1.91)
Hispanic	2.46***	(0.34, 6.45)	2.46***	(1.87, 3.24)
Asian	1.31	(0.23, 1.64)	1.33	(0.95, 1.86)
Mixed	0.99	(0.44, -0.05)	0.98	(0.40, 2.36)
Year	1.10***	(0.03, 4.02)	1.10***	(1.05, 1.16)
Mandated Reporter	2.23***	(0.48, 3.57)	2.20***	(1.43, 3.38)
Total Children	0.91	(0.07, -1.40)	0.90	(0.78, 1.04)
Child Referral History	0.85	(0.13, -1.07)	0.85	(0.64, 1.14)
Child Capacity Problems				
Developmental	0.45†	(0.20, -1.84)	0.44†	(0.19, 1.05)
Medical/Mental	1.27	(0.33, 0.77)	1.23	(0.73, 2.08)

Physical	1.17	(0.71, 0.23)	1.15	(0.34, 3.86)
Parent Arrest History	1.38†	(0.24, 1.81)	1.38†	(0.97, 1.95)
Parent Childhood Maltxt	1.23	(0.19, 1.40)	1.24	(0.92, 1.67)
Housing Issues	2.30***	(0.48, 4.05)	2.30***	(1.54, 3.45)
Total Allegations	1.05	(0.09, 0.59)	1.05	(0.88, 1.26)
Allegation Type				
Substantial Risk	17.65***	(5.01, 10.00)	17.51***	(9.99, 30.70)
Sibling Abused	1.18	(0.20, 1.03)	1.19	(0.86, 1.65)
Sexual Abuse				
Severe Neglect	3.21***	(1.15, 3.37)	3.27***	(1.64, 6.52)
Physical abuse	0.89	(0.13, -0.69)	0.90	(0.68, 1.21)
General Neglect	2.79***	(0.43, 6.64)	2.77***	(2.05, 3.75)
Exploitation				
Emotional Abuse	1.72***	(0.25, 3.72)	1.72***	(1.29, 2.28)
Absence/Incapacity	5.18***	(1.14, 7.57)	5.22***	(3.40, 8.01)
Neglect Risk Score	0.87***	(0.03, -3.48)	0.87***	(0.81, 0.94)
Abuse Risk Score	1.48***	(0.08, 7.58)	1.48***	(1.34, 1.63)
Any Substantiations				
Intercept	0.01***	(0.00, -14.07)	0.01***	(0.01, 0.02)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for safety decision is "safe"; reference group for race is Black/African American; reference group for age is no child younger than six years old; blank table cells indicate variables that did not meet Benjamini-Hochberg-corrected significance threshold in bivariate analysis.

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

- not estimable

Once the interaction between safety decision and exposure group was added in model 2, however, only the main effect of SA remained significant (*OR*=4.15, $p \leq 0.001$); this estimate suggests that the odds of substantiation in "safe" SA households were more than four times those in "safe" households with no MH or SA, whereas the odds in "safe" MH (*OR*=1.05, $p=0.87$) and MHSA (*OR*=1.71, $p=0.33$) households were not significantly different than those in "safe" households with no MH or SA.

The likelihood ratio test favored the interaction model over the main effects model, but the test statistic only just reached significance (chi2[4]=10.01, p=0.04), and none of the decision x exposure interaction terms reached statistical significance; only Safe with Plan x MH was marginally significant (*OR*=0.50, $p \leq 0.10$). Furthermore, two interaction terms (Unsafe x MH and Unsafe x MHSA) were not estimable. This result is likely because only one "unsafe" MH household had no substantiated allegations, and not a single "unsafe" MHSA household had no

substantiated allegations. Bonferroni-corrected pairwise comparisons estimated from the second model are displayed in Table 3.7.

Table 3.7

Odds Ratios Comparing Substantiation Risk by Safety Decision and Exposure Group

	1	2	3	4	5	6	7	8	9	10	11	12
1. Safe x No MH or SA	1											
2. Safe x MH	1.05	1										
3. Safe x SA	4.15*	3.96*	1									
4. Safe x MHSA	1.71	1.63	0.41	1								
5. Safe with Plan x No MH or SA	5.74*	5.48*	1.38	3.35	1							
6. Safe with Plan x MH	3.00*	2.86	0.72	1.75	0.52	1						
7. Safe with Plan x SA	18.96*	18.10*	4.57*	11.07*	3.30*	6.32*	1					
8. Safe with Plan x MHSA	21.28*	20.32*	5.13	12.43*	3.70	7.10*	1.12	1				
9. Unsafe x No MH or SA	93.08*	88.87*	22.43*	54.36*	16.20*	31.04*	4.91	4.37	1			
10. Unsafe x MH	-	-	-	-	-	-	-	-	-	1		
11. Unsafe x SA	629.42*	600.95*	151.66*	367.61*	109.58*	209.87*	33.20	29.58	6.76	-	1	
12. Unsafe x MHSA	-	-	-	-	-	-	-	-	-	-	-	1

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse.

* $p \leq 0.0008$ (Bonferroni-corrected p-value)

Figure 3.4, Panel A, which displays marginal predicted probabilities of substantiation by exposure group and safety decision, appears consistent with model estimates, though it is difficult to interpret because of these unestimable coefficients. Though weak, the interaction between safety decision and exposure suggests that exposure matters less as safety decision severity increases. This finding is consistent with hypothesis 3b, but not 3a; risk differences by exposure group appear to be greater when the decision is “safe” than “safe with plan”, and smallest when the decision is “unsafe”.

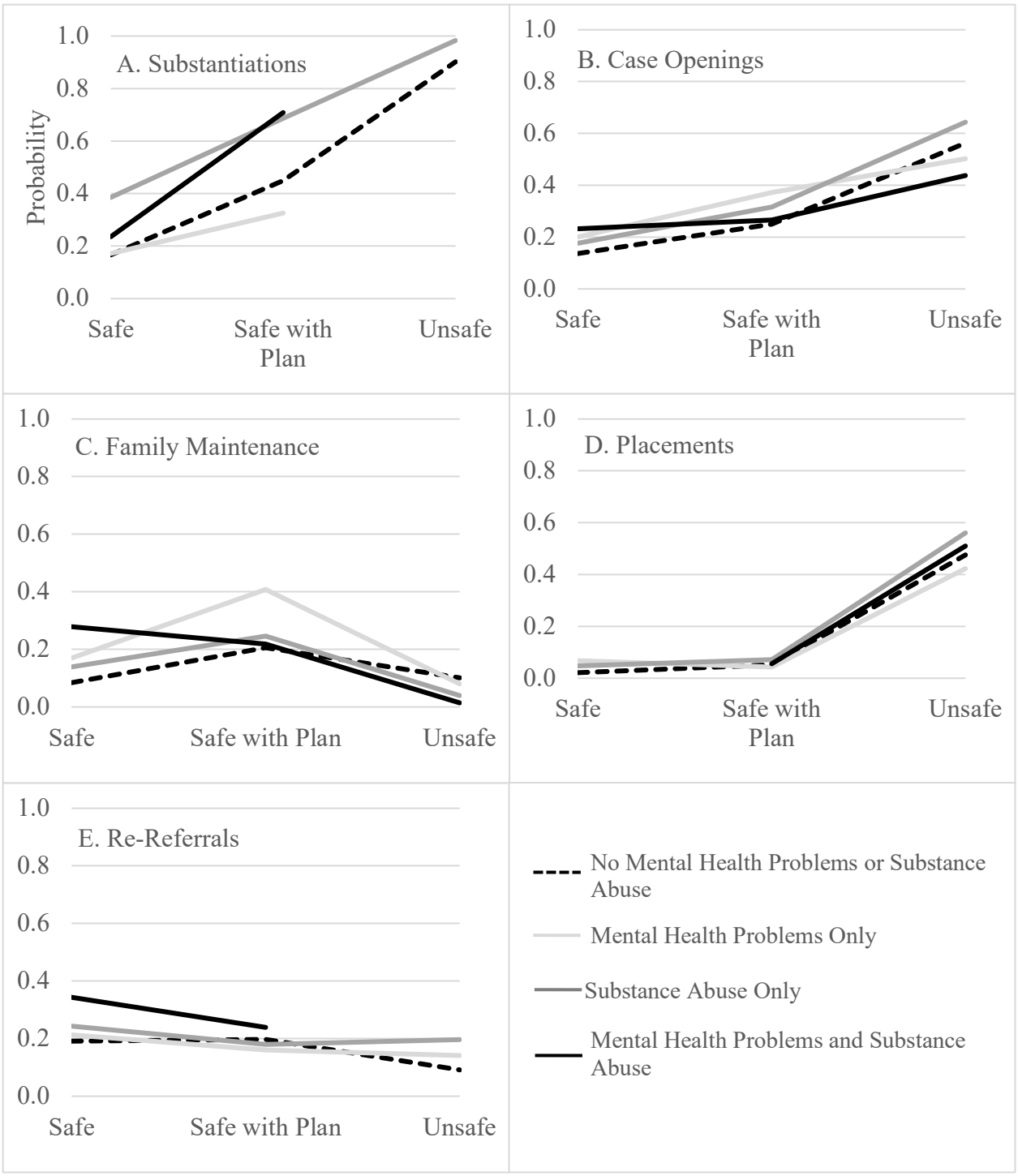

Figure 3.4. Marginal Predicted Probabilities of Child Welfare Outcomes, by Exposure Group and Safety Decision.

Case Openings. Table 3.8 displays results of the three adjusted case openings models. The main effects of MH (*OR*=1.85, $p \leq 0.01$) and MHSA (*OR*=2.41, $p \leq 0.001$) were significant in the first model, suggesting that these households were twice as likely overall to have a case

opening even after taking into account the effect of safety decision and all adjustment variables. These findings are fairly consistent with hypothesis 2.

Table 3.8

Odds of Case Opening among Households Investigated for Maltreatment: Adjusted Analysis

	Main Effect + Pre-Decision Adjustment Variables		Interaction + Pre-Decision Adjustment Variables		Interaction + All Adjustment Variables	
	OR	95% CI	*OR*	95% CI	*OR*	95% CI
Final Decision						
Safe with Plan	6.40***	(5.01, 8.18)	6.69***	(4.99, 8.95)	3.50***	(2.54, 4.82)
Unsafe	82.16***	(52.65, 128.20)	112.57***	(62.99, 201.20)	34.53***	(18.66, 63.88)
Exposure						
MH	1.85**	(1.24, 2.77)	2.21**	(1.25, 3.89)	2.13*	(1.13, 4.01)
SA	2.41***	(1.64, 3.54)	2.50***	(1.45, 4.31)	1.63	(0.89, 2.98)
MHSA	1.45	(0.82, 2.59)	2.95*	(1.04, 8.38)	2.94†	(0.97, 8.94)
Decision x Exposure						
Safe with Plan x MH			0.87	(0.40, 1.89)	1.30	(0.54, 3.12)
Safe with Plan x SA			0.93	(0.46, 1.87)	1.09	(0.50, 2.36)
Safe with Plan x MHSA			0.50	(0.15, 1.69)	0.40	(0.11, 1.45)
Unsafe x MH			0.32†	(0.09, 1.08)	0.32†	(0.09, 1.15)
Unsafe x SA			0.88	(0.25, 3.08)	1.00	(0.28, 3.62)
Unsafe x MHSA			0.19*	(0.05, 0.80)	0.15*	(0.03, 0.67)
Youngest Child						
0-1	1.68***	(1.25, 2.25)	1.69***	(1.26, 2.28)	1.65**	(1.20, 2.28)
2-5	0.75†	(0.55, 1.03)	0.76†	(0.55, 1.04)	0.72†	(0.52, 1.01)
Child Race						
White	0.91	(0.63, 1.33)	0.91	(0.63, 1.33)	0.82	(0.55, 1.24)
Hispanic	1.01	(0.75, 1.36)	1.01	(0.75, 1.36)	0.72†	(0.52, 1.00)
Asian	1.75**	(1.22, 2.52)	1.76**	(1.22, 2.54)	1.58*	(1.06, 2.36)
Mixed	0.58	(0.23, 1.46)	0.56	(0.22, 1.43)	0.48	(0.17, 1.33)
Year	1.33***	(1.26, 1.40)	1.33***	(1.26, 1.40)	1.31***	(1.24, 1.39)
Mandated Reporter						

Total Children	0.92	(0.79, 1.08)	0.92	(0.79, 1.08)	0.96	(0.81, 1.14)
Child Referral History	0.77	(0.55, 1.08)	0.76	(0.54, 1.07)	0.83	(0.58, 1.20)
Child Capacity Problems						
Developmental	1.44	(0.64, 3.25)	1.50	(0.67, 3.37)	2.02	(0.85, 4.78)
Medical/Mental	0.62	(0.35, 1.11)	0.62	(0.35, 1.11)	0.55†	(0.30, 1.02)
Physical	0.86	(0.25, 2.90)	0.90	(0.27, 3.00)	0.79	(0.23, 2.77)
Parent Arrest History	1.57**	(1.12, 2.21)	1.56**	(1.11, 2.20)	1.40†	(0.96, 2.03)
Parent Childhood Maltxt	1.10	(0.81, 1.49)	1.10	(0.81, 1.49)	1.07	(0.77, 1.49)
Housing Issues	1.30	(0.88, 1.91)	1.32	(0.90, 1.94)	1.06	(0.70, 1.60)
Total Allegations	1.17	(0.97, 1.43)	1.17	(0.96, 1.42)	1.18	(0.96, 1.46)
Allegation Type						
Substantial Risk	12.09***	(7.21, 20.27)	11.86***	(7.05, 19.96)	4.66***	(2.70, 8.04)
Sibling Abused	1.22	(0.84, 1.77)	1.23	(0.84, 1.78)	1.08	(0.72, 1.62)
Sexual Abuse						
Severe Neglect	0.81	(0.38, 1.70)	0.81	(0.39, 1.70)	0.43*	(0.20, 0.92)
Physical abuse	0.90	(0.64, 1.26)	0.89	(0.64, 1.25)	0.86	(0.59, 1.23)
General Neglect	1.73***	(1.24, 2.43)	1.75***	(1.25, 2.46)	1.10	(0.76, 1.60)
Exploitation						
Emotional Abuse	1.24	(0.89, 1.72)	1.24	(0.89, 1.72)	1.07	(0.75, 1.52)
Absence/Incapacity	2.41***	(1.56, 3.73)	2.38***	(1.54, 3.69)	1.33	(0.84, 2.13)
Neglect Risk Score	1.07†	(0.99, 1.16)	1.07†	(0.99, 1.16)	1.12**	(1.03, 1.22)
Abuse Risk Score	1.22***	(1.10, 1.36)	1.22***	(1.10, 1.36)	1.10†	(0.99, 1.24)
Any Substantiations					9.75***	(7.30, 13.04)
Intercept	0.01***	(0.01, 0.01)	0.01***	(0.00, 0.01)	0.01***	(0.00, 0.01)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for safety decision is "safe"; reference group for race is Black/African American; reference group for age is no child younger than six years old; blank table cells indicate variables that did not meet Benjamini-Hochberg-corrected significance threshold in bivariate analysis.
† $p \leq 0.10$

* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$

Decision x exposure interaction terms provided little evidence of interactive effects, and the likelihood ratio test of the first and second models reflected this (chi2[4]=7.05, p=0.32). Only the coefficient associated with "unsafe" MHSA households was significant and less than one (*OR*=0.15, $p \leq 0.05$), suggesting that higher risk of case opening associated with MHSA decreased as severity of safety decision increased. The Bonferroni-corrected pairwise comparisons estimated from the third model supported this finding (see Table 3.9); the *OR* comparing "unsafe" MHSA households to "unsafe" households with no MH or SA was less than one, though non-significant (*OR*=0.45, *p*=0.14).

Table 3.9

Odds Ratios Comparing Case Opening Risk by Safety Decision and Exposure Group

	1	2	3	4	5	6	7	8	9	10	11	12
1. Safe x No MH or SA	1											
2. Safe x MH	2.13	1										
3. Safe x SA	1.63	0.77	1									
4. Safe x MHSA	2.94	1.38	1.80	1								
5. Safe with Plan x No MH or SA	3.50*	1.64	2.14	1.19	1							
6. Safe with Plan x MH	9.70*	4.56*	5.95*	3.30	2.77	1						
7. Safe with Plan x SA	6.20*	2.91	3.80*	2.11	1.77	0.64	1					
8. Safe with Plan x MHSA	4.07*	1.91	2.50	1.38	1.16	0.42	0.66	1				
9. Unsafe x No MH or SA	34.53*	16.21*	21.16*	11.73*	9.87*	3.56	5.57*	8.48*	1			
10. Unsafe x MH	23.64*	11.10*	14.49*	8.03	6.76*	2.44	3.81	5.81	0.68	1		
11. Unsafe x SA	56.50*	26.52*	34.63*	19.20*	16.16*	5.82	9.11*	13.88*	1.64	2.39	1	
12. Unsafe x MHSA	15.43*	7.24*	9.46*	5.24	4.41	1.59	2.49	3.79	0.45	0.65	0.27	1

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse.

* $p \leq 0.0008$ (Bonferroni-corrected p-value)

Figure 3.4, Panel B displays marginal predicted probabilities of case opening by exposure group and safety decision. Taken together, these results suggest likelihood of case opening is generally higher among MH, SA, and MHSA households than among comparison households, and these effects tend to be fairly similar for each safety decision; the exceptions again are consistent with hypothesis 3b but not 3a.

The addition of Any Substantiations in the third model (*OR*=9.75, $p \leq 0.001$) appears to account for some of the variance in likelihood of case opening that was otherwise attributable to safety decision, given that the *OR*s associated with the main effects of "safe with plan" and "unsafe" both decreased in size with its addition—though they both remained significant (*OR*=3.50, $p \leq 0.001$ and *OR*=34.53, $p \leq 0.001$, respectively). As expected, this finding suggests that cases opened on the heels of a "safe with plan" or "unsafe" decision tended to be opened because at least one allegation was substantiated, but not always.

Family Maintenance. Table 3.10 displays results of the three adjusted family maintenance models. The first model indicates that compared to households with no MH or SA, the odds associated with family maintenance were nearly three times as high in MH households (*OR*=2.70, $p \leq 0.001$) and twice as high in SA households (*OR*=1.87, $p \leq 0.001$) after taking into account the effect of safety decision and adjustment variables. This finding provides some evidence in favor of hypothesis 2.

Table 3.10

Odds of Family Maintenance among Households Investigated for Maltreatment: Adjusted Analysis

	Main Effect + Pre-Decision Adjustment Variables		Interaction + Pre-Decision Adjustment Variables		Interaction + All Adjustment Variables	
	OR	95% CI	*OR*	95% CI	*OR*	95% CI
Final Decision						
Safe with Plan	6.85***	(5.38, 8.70)	7.44***	(5.57, 9.94)	3.76***	(2.74, 5.15)
Unsafe	1.25	(0.85, 1.82)	4.58***	(2.83, 7.41)	1.28	(0.78, 2.11)
Exposure						
MH	2.70***	(1.91, 3.81)	3.25***	(1.84, 5.74)	2.74**	(1.47, 5.12)
SA	1.87***	(1.30, 2.69)	3.32***	(1.92, 5.75)	2.02*	(1.12, 3.67)
MHSA	1.18	(0.73, 1.91)	8.01***	(2.98, 21.54)	6.60***	(2.17, 20.06)
Decision x Exposure						
Safe with Plan x MH			0.90	(0.43, 1.90)	1.47	(0.64, 3.37)
Safe with Plan x SA			0.59	(0.30, 1.16)	0.68	(0.33, 1.41)
Safe with Plan x MHSA			0.20**	(0.06, 0.61)	0.17**	(0.05, 0.59)
Unsafe x MH			0.22**	(0.09, 0.57)	0.27**	(0.10, 0.70)
Unsafe x SA			0.10***	(0.04, 0.24)	0.15***	(0.06, 0.37)
Unsafe x MHSA			0.01***	(0.00, 0.05)	0.02***	(0.00, 0.07)
Youngest Child						
0-1	1.81***	(1.37, 2.39)	1.84***	(1.40, 2.44)	1.80***	(1.34, 2.42)
2-5	1.10	(0.82, 1.47)	1.13	(0.84, 1.52)	1.10	(0.81, 1.49)
Child Race						
White						
Hispanic						
Asian						
Mixed						
Year						
Mandated Reporter						

Total Children						
Child Referral History						
Child Capacity Problems						
Developmental						
Medical/Mental						
Physical						
Parent Arrest History	1.20	(0.88, 1.64)	1.25	(0.91, 1.71)	1.14	(0.82, 1.60)
Parent Childhood Maltxt	1.22	(0.93, 1.60)	1.20	(0.91, 1.57)	1.11	(0.84, 1.49)
Housing Issues	0.97	(0.69, 1.36)	1.04	(0.73, 1.46)	0.83	(0.58, 1.19)
Total Allegations	1.17*	(1.01, 1.36)	1.13	(0.97, 1.32)	1.02	(0.86, 1.21)
Allegation Type						
Substantial Risk	7.05***	(4.53, 10.96)	6.90***	(4.41, 10.82)	3.91***	(2.47, 6.19)
Sibling Abused						
Sexual Abuse						
Severe Neglect						
Physical abuse	0.88	(0.66, 1.18)	0.91	(0.68, 1.22)	1.01	(0.74, 1.38)
General Neglect	1.82***	(1.38, 2.41)	1.84***	(1.39, 2.43)	1.61**	(1.19, 2.16)
Exploitation						
Emotional Abuse	1.15	(0.88, 1.52)	1.19	(0.90, 1.58)	1.21	(0.90, 1.62)
Absence/Incapacity						
Neglect Risk Score	0.98	(0.91, 1.05)	0.98	(0.92, 1.06)	1.02	(0.94, 1.09)
Abuse Risk Score	1.23***	(1.12, 1.35)	1.21***	(1.10, 1.33)	1.13*	(1.02, 1.24)
Any Substantiations					8.20***	(6.19, 10.88)
Intercept	0.02***	(0.01, 0.03)	0.02***	(0.01, 0.02)	0.01***	(0.01, 0.02)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for safety decision is "safe"; reference group for race is Black/African American; reference group for age is no child younger than six years old; blank table cells indicate variables that did not meet Benjamini-Hochberg-corrected significance threshold in bivariate analysis.
† $p \leq 0.10$

* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$

A number of decision x exposure interaction terms were significant, however, suggesting that the effects of MH, SA, and MHSA on odds of family maintenance depended on safety decision. Indeed, the likelihood ratio test of the first and second models was highly significant, thus favoring the interaction model (chi2[4]=58.36, p≤0.0001). In the third and final model, the coefficient associated with "safe with plan" MHSA households (*OR*=0.17, *p*≤0.01) suggests that the main effect of MHSA (*OR*=6.60, *p*≤0.001) was reduced when the safety decision was "safe with plan" versus "safe". Bonferroni-corrected pairwise comparisons (see Table 3.11) supported this finding; the *OR* comparing "safe with plan" MHSA households to "safe with plan" households with no MH or SA was non-significant (*OR*=1.12, *p*=0.74). The coefficient associated with "safe with plan" MH households (*OR*=1.47, *p*=0.36) was greater than one (albeit non-significantly so); perhaps with a larger sample size, this finding would provide evidence in favor of hypothesis 3a, namely that the effect of MH on likelihood of family maintenance is larger among "safe with plan" households than among "safe" or "unsafe" households.

Table 3.11

Odds Ratios Comparing Family Maintenance Risk by Safety Decision and Exposure Group

	1	2	3	4	5	6	7	8	9	10	11	12
1. Safe x No MH or SA	1											
2. Safe x MH	2.74	1										
3. Safe x SA	2.02	0.74	1									
4. Safe x MHSA	6.60	2.41	3.26	1								
5. Safe with Plan x No MH or SA	3.76*	1.37	1.86	0.57	1							
6. Safe with Plan x MH	15.14*	5.52*	7.48*	2.30	4.03*	1						
7. Safe with Plan x SA	5.19*	1.89	2.56	0.79	1.38	0.34	1					
8. Safe with Plan x MHSA	4.20*	1.53	2.07	0.64	1.12	0.28	0.81	1				
9. Unsafe x No MH or SA	1.28	0.47	0.63	0.19	0.34*	0.08*	0.25*	0.30	1			
10. Unsafe x MH	0.94	0.34	0.46	0.14	0.25*	0.06*	0.18*	0.22	0.73	1		
11. Unsafe x SA	0.40	0.15*	0.20*	0.06*	0.11*	0.03*	0.08*	0.10*	0.31	0.43	1	
12. Unsafe x MHSA	0.13*	0.05*	0.06*	0.02*	0.03*	0.01*	0.03*	0.03*	0.10*	0.14	0.33	1

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse.

* $p \leq 0.0008$ (Bonferroni-corrected *p*-value)

All three interaction terms associated with "unsafe" households were significant and less than one, suggesting that the main effects of MH, SA, and MHSA were reduced when the decision was "unsafe" versus "safe", again supporting hypothesis 3b. Bonferroni-corrected pairwise comparisons (see Table 3.10) showed that among "unsafe" households, the odds of family maintenance in MH (*OR*=0.73, *p*=0.41) and SA (*OR*=0.31, *p*=0.001) households were non-significantly different than in households with no MH or SA. Notably, the odds of family maintenance among "unsafe" MHSA households were significantly lower than among "unsafe" households with no MH or SA (*OR*=0.10, $p \leq 0.0008$). Figure 3.4, Panel C displays marginal predicted probabilities of family maintenance by exposure group and safety decision.

Taken together, these results suggest that overall likelihood of family maintenance is highest when the decision is "safe with plan", and the additional risk of family maintenance conferred by MH, SA, and MHSA is similar when the decision is "safe" and "safe with plan" but is diminished when the decision is "unsafe". This finding may be attributable to the fact that an "unsafe" household is almost by definition a household that will have a placement and not family maintenance, in which case parental mental health problems and substance use may not confer any additional risk. (It should be noted though that family maintenance and placement are not mutually exclusive in households with more than one child; one child may be placed and another not).

As in the case openings models, the addition of Any Substantiations in the third family maintenance model (*OR*=8.20, $p \leq 0.001$) appears to account for some of the variance in likelihood of family maintenance that was otherwise attributable to safety decision, given that the *OR*s associated with the main effects of "safe with plan" and "unsafe" both decreased in size with its addition, and the OR associated with the main effect of "unsafe" was reduced to non-significance (*OR*=1.28, *p*=0.33). However, that the main effect of "safe with plan" remained significant (*OR*=3.76, $p \leq 0.001$) suggests there is something unique about these households that makes them more likely to receive family maintenance services, irrespective of whether an allegation is substantiated. One possibility is that the SDM risk assessment's neglect and abuse risk inventories played a role in opening a family maintenance case, as per SDM logic. To that point, Neglect Risk Score was significantly associated with case opening likelihood (*OR*=1.12, $p \leq 0.01$), and Abuse Risk Score marginally significantly associated (*OR*=1.10, $p \leq 0.10$). Granted, both effects were much smaller than that of Any Substantiations.

Placements. Table 3.12 displays results of the adjusted placement models. Unsurprisingly, the *OR* associated with an "unsafe" decision was extreme in all three models; this is because an "unsafe" decision can in theory completely determine whether or not a child is placed. However, several scenarios were posited earlier that could account for why "safe" or "safe with plan" households might experience placements within 30 days of the safety assessment, and model estimates identify other sources of influence that help explain variance in placement risk. Only SA had a significant main effect in the first model (*OR*=2.22, $p \leq 0.01$), providing limited evidence in support of hypothesis 2. Nonetheless, this is a remarkable finding given that SA is associated with twice the odds of placement after accounting for safety decision and other adjustment variables.

Table 3.12

Odds of Placement among Households Investigated for Maltreatment: Adjusted Analysis

	Main Effect + Pre-Decision Adjustment Variables		Interaction + Pre-Decision Adjustment Variables		Interaction + All Adjustment Variables	
	OR	95% CI	*OR*	95% CI	*OR*	95% CI
Final Decision						
Safe with Plan	3.61***	(2.18, 5.95)	5.01***	(2.59, 9.67)	2.79**	(1.40, 5.57)
Unsafe	218.51***	(130.83, 364.97)	330.26***	(168.04, 649.09)	128.53***	(62.32, 265.07)
Exposure						
MH	1.18	(0.63, 2.19)	5.50***	(2.00, 15.08)	4.14**	(1.45, 11.76)
SA	2.22**	(1.26, 3.91)	3.67*	(1.32, 10.20)	2.58†	(0.90, 7.35)
MHSA	1.42	(0.70, 2.88)	1.26	(0.48, 3.32)	1.21	(0.46, 3.18)
Decision x Exposure						
Safe with Plan x MH			0.14**	(0.03, 0.59)	0.20*	(0.05, 0.85)
Safe with Plan x SA			0.57	(0.17, 1.86)	0.61	(0.18, 2.04)
Safe with Plan x MHSA			1.12	(0.34, 3.70)	0.93	(0.28, 3.10)
Unsafe x MH			0.13**	(0.04, 0.48)	0.18**	(0.05, 0.66)
Unsafe x SA			0.46	(0.13, 1.59)	0.61	(0.17, 2.17)
Unsafe x MHSA			-	-	-	-
Youngest Child						
0-1	0.98	(0.61, 1.56)	0.98	(0.61, 1.56)	0.91	(0.56, 1.46)
2-5	0.43**	(0.25, 0.74)	0.43**	(0.25, 0.75)	0.43**	(0.24, 0.74)
Child Race						
White	0.87	(0.51, 1.50)	0.88	(0.52, 1.51)	0.86	(0.50, 1.48)
Hispanic	0.79	(0.50, 1.25)	0.79	(0.49, 1.25)	0.70	(0.44, 1.13)
Asian	1.36	(0.76, 2.43)	1.39	(0.77, 2.50)	1.27	(0.70, 2.33)
Mixed	0.86	(0.24, 3.09)	0.82	(0.23, 2.88)	0.82	(0.23, 2.90)
Year	1.16***	(1.07, 1.25)	1.15***	(1.07, 1.25)	1.15***	(1.06, 1.24)
Mandated Reporter						

Total Children	0.86	(0.65, 1.13)	0.85	(0.65, 1.12)	0.89	(0.68, 1.16)
Child Referral History	0.78	(0.45, 1.37)	0.76	(0.43, 1.34)	0.83	(0.47, 1.48)
Child Capacity Problems						
Developmental	2.92*	(1.00, 8.56)	3.01*	(1.01, 8.91)	3.15†	(0.96, 10.29)
Medical/Mental						
Physical	0.54	(0.13, 2.24)	0.53	(0.13, 2.20)	0.68	(0.16, 2.90)
Parent Arrest History	1.84*	(1.14, 2.97)	1.78*	(1.11, 2.86)	1.66*	(1.02, 2.68)
Parent Childhood Maltxt	1.07	(0.68, 1.68)	1.07	(0.68, 1.67)	1.03	(0.65, 1.61)
Housing Issues	1.72*	(1.06, 2.80)	1.74*	(1.07, 2.81)	1.61†	(1.00, 2.62)
Total Allegations	1.24	(0.93, 1.64)	1.22	(0.92, 1.62)	1.18	(0.89, 1.57)
Allegation Type						
Substantial Risk						
Sibling Abused	1.30	(0.68, 2.49)	1.29	(0.67, 2.49)	1.18	(0.61, 2.25)
Sexual Abuse						
Severe Neglect	0.31*	(0.12, 0.81)	0.32*	(0.12, 0.86)	0.27**	(0.10, 0.72)
Physical abuse	1.33	(0.74, 2.39)	1.40	(0.78, 2.52)	1.47	(0.82, 2.64)
General Neglect	1.14	(0.66, 1.96)	1.16	(0.67, 1.99)	0.94	(0.54, 1.64)
Exploitation						
Emotional Abuse	1.02	(0.60, 1.72)	1.02	(0.60, 1.71)	1.02	(0.61, 1.72)
Absence/Incapacity	3.74***	(2.08, 6.72)	3.73***	(2.08, 6.71)	3.01***	(1.67, 5.40)
Neglect Risk Score	1.11†	(0.99, 1.24)	1.12*	(1.00, 1.25)	1.14*	(1.02, 1.27)
Abuse Risk Score	1.01	(0.87, 1.18)	1.01	(0.86, 1.17)	0.95	(0.82, 1.11)
Any Substantiations					5.07***	(2.86, 8.99)
Intercept	0.00***	(0.00, 0.01)	0.00***	(0.00, 0.01)	0.00***	(0.00, 0.01)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for safety decision is "safe"; reference group for race is Black/African American; reference group for age is no child younger than six years old; blank table cells indicate variables that did not meet Benjamini-Hochberg-corrected significance threshold in bivariate analysis.
† $p \leq 0.10$

* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$
- not estimable

The likelihood ratio test of the first and second models favored the interaction model (chi2[4]=11.51, p≤0.05), suggesting that the effects of MH, SA, and MHSA depended on safety decision. In the final model, MH was associated with four times the odds of placement among "safe" households (*OR*=4.14, *p*≤0.01); SA was associated with marginally significantly higher odds (*OR*=2.58, *p*≤0.10). However, few decision x exposure interaction terms were significant. The significant negative coefficient associated with "safe with plan" MH households (*OR*=0.20, *p*≤0.05) suggests that the main effect of MH (*OR*=4.14, *p*≤0.01) was reduced when the safety decision was "safe with plan". Bonferroni-corrected pairwise comparisons from the third model supported this finding; the *OR* comparing "safe with plan" MH households to "safe with plan" households with no MH or SA was non-significant (*OR*=0.81, *p*=0.71). Similarly, the significant negative coefficient associated with "unsafe" MH households (*OR*=0.18, *p*≤0.01) suggests that the main effect of MH was reduced when the safety decision was "unsafe". Bonferroni-corrected pairwise comparisons (see Table 3.13) showed that among "unsafe" households, the odds of placement in MH were non-significantly different than in households with no MH or SA (*OR*=0.75, *p*=0.49).

Table 3.13

Odds Ratios Comparing Placement Risk by Safety Decision and Exposure Group

	1	2	3	4	5	6	7	8	9	10	11	12
1. Safe x No MH or SA	1											
2. Safe x MH	4.14	1										
3. Safe x SA	2.58	0.62	1									
4. Safe x MHSA	1	-	-	1								
5. Safe with Plan x No MH or SA	2.79	0.68	1.08	-	1							
6. Safe with Plan x MH	2.28	0.55	0.89	-	0.82	1						
7. Safe with Plan x SA	4.37	1.06	1.70	-	1.57	1.92	1					
8. Safe with Plan x MHSA	3.14	0.76	1.22	-	1.13	1.38	0.72	1				
9. Unsafe x No MH or SA	128.53*	31.08*	49.85*	-	46.03*	56.31*	29.39*	40.89*	1			
10. Unsafe x MH	95.85*	23.18*	37.18*	-	34.33*	42.00*	21.92*	30.49*	0.75	1		
11. Unsafe x SA	203.25*	49.14*	78.84*	-	72.80*	89.06*	46.48*	64.66*	1.58	2.12	1	
12. Unsafe x MHSA	155.01*	37.48*	60.13*	-	55.52*	67.92*	35.45*	49.31*	1.21	1.62	0.76	1

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse.

* $p \leq 0.0008$ (Bonferroni-corrected p-value)

Figure 3.4, Panel D displays marginal predicted probabilities of placement by exposure group and safety decision. The evidence of interaction tends to suggest that any increased risk associated with exposure group among "safe" households tended to be equalized by an "unsafe" decision. Note that Unsafe x MHSA was omitted due to collinearity; this is likely because

Follow-up analysis examined placement type among households that experienced any placements (see Table 3.14). Among households that experienced any placements (n=458), the most common placement type was foster care (74%). Placement with relatives was also common (41%); group home placement less so (11%). Chi-square testing indicated no significant association between exposure group and foster care placement (chi2[3]=3.91, p=0.27). However, exposure group was significantly associated with placement with relatives (chi2[3]=15.62, p=0.001). This placement type was most common among MHSA households (55%), followed by SA households (44%), households with no MH or SA (33%) and MH households (32%). Exposure group was also significantly associated with group home placement (chi2[3]=60.95, $p\leq$0.001), though small cell sizes suggest that this finding should be interpreted cautiously; MH, SA, and MHSA households each had fewer than five such placements.

Table 3.14

Percent of Households with Placed Children that Experienced Foster, Relative, and Group Home Placement

	Overall (n=458)	No Mental Health Problems or Substance Abuse (n=158)	Mental Health Problems Only (n=60)	Substance Abuse Only (n=139)	Mental Health Problems & Substance Abuse (n=101)
Any Foster Home Placements	74	68	80	76	75
Any Placement with Relatives	41	33	32	44	55
Any Group Home Placements	11	27	3	3	< 1

Re-Referrals. Table 3.15 displays results of the adjusted re-referral models. The first model suggests that "unsafe" (*OR*=0.47, $p \leq 0.10$) but not "safe with plan" households (*OR*=0.95, $p=0.67$) were less likely to be re-referred. Consistent with hypothesis 2, the first model also suggests that exposure group does not account for increased likelihood of re-referral above and beyond safety decision, given that the *OR*s associated with MH, SA, and MHSA were non-significant.

Table 3.15

Odds of Re-Referral among Households Investigated for Maltreatment: Adjusted Analysis

	Main Effect + Pre-Decision Adjustment Variables		Interaction + Pre-Decision Adjustment Variables		Interaction + All Adjustment Variables	
	OR	95% CI	*OR*	95% CI	*OR*	95% CI
Final Decision						
Safe with Plan	0.95	(0.76, 1.19)	1.05	(0.81, 1.35)	1.04	(0.80, 1.35)
Unsafe	0.47†	(0.22, 1.02)	0.43	(0.13, 1.43)	0.42	(0.12, 1.41)
Exposure						
MH	1.02	(0.68, 1.55)	1.15	(0.68, 1.95)	1.15	(0.68, 1.94)
SA	1.20	(0.83, 1.76)	1.37	(0.86, 2.19)	1.37	(0.86, 2.18)
MHSA	1.48	(0.82, 2.69)	2.28†	(0.87, 6.01)	2.26†	(0.86, 5.97)
Decision x Exposure						
Safe with Plan x MH			0.68	(0.29, 1.58)	0.67	(0.29, 1.57)
Safe with Plan x SA			0.66	(0.33, 1.30)	0.65	(0.33, 1.29)
Safe with Plan x MHSA			0.57	(0.18, 1.81)	0.57	(0.18, 1.80)
Unsafe x MH			1.44	(0.19, 10.75)	1.44	(0.19, 10.75)
Unsafe x SA			1.81	(0.29, 11.39)	1.80	(0.29, 11.34)
Unsafe x MHSA			-	-	-	-
Youngest Child						
0-1	1.09	(0.85, 1.40)	1.09	(0.85, 1.39)	1.08	(0.84, 1.39)
2-5	0.81†	(0.64, 1.02)	0.81†	(0.64, 1.02)	0.81†	(0.64, 1.02)
Child Race						
White	0.79	(0.59, 1.07)	0.80	(0.60, 1.08)	0.80	(0.60, 1.08)
Hispanic	0.78*	(0.62, 0.99)	0.79*	(0.62, 0.99)	0.79*	(0.62, 0.99)
Asian	0.60***	(0.45, 0.81)	0.61***	(0.45, 0.82)	0.61***	(0.45, 0.82)
Mixed	1.60	(0.81, 3.17)	1.58	(0.80, 3.14)	1.59	(0.80, 3.15)
Year	1.04†	(1.00, 1.09)	1.04†	(0.99, 1.09)	1.04	(0.99, 1.09)

Mandated Reporter	0.70*	(0.51, 0.97)	0.70*	(0.50, 0.96)	0.69*	(0.50, 0.96)
Total Children						
Child Referral History	1.39**	(1.09, 1.77)	1.38**	(1.09, 1.76)	1.39**	(1.09, 1.77)
Child Capacity Problems						
Developmental						
Medical/Mental						
Physical						
Parent Arrest History	1.16	(0.84, 1.59)	1.16	(0.84, 1.60)	1.15	(0.84, 1.59)
Parent Childhood Maltxt	0.95	(0.72, 1.26)	0.95	(0.72, 1.26)	0.95	(0.71, 1.26)
Housing Issues						
Total Allegations						
Allegation Type						
Substantial Risk	1.57†	(1.00, 2.47)	1.53†	(0.97, 2.41)	1.50†	(0.94, 2.39)
Sibling Abused						
Sexual Abuse						
Severe Neglect						
Physical abuse	0.89	(0.71, 1.12)	0.90	(0.71, 1.13)	0.90	(0.71, 1.13)
General Neglect	1.07	(0.86, 1.33)	1.08	(0.87, 1.35)	1.08	(0.87, 1.34)
Exploitation						
Emotional Abuse						
Absence/Incapacity						
Neglect Risk Score	1.02	(0.96, 1.09)	1.02	(0.96, 1.09)	1.02	(0.96, 1.09)
Abuse Risk Score	1.03	(0.94, 1.13)	1.03	(0.94, 1.13)	1.03	(0.94, 1.13)
Any Substantiations						
Any Family Maintenance					1.06	(0.78, 1.44)
Intercept	0.34***	(0.22, 0.51)	0.33***	(0.22, 0.50)	0.34***	(0.22, 0.51)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for safety decision is “safe”; reference group for race is Black/African American; reference group for age is no child younger than six years old;

blank table cells indicate variables that did not meet Benjamini-Hochberg-corrected significance threshold in bivariate analysis; models include only households with no placements.
† $p \leq 0.10$
* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$
- not estimable

The likelihood ratio test of the first and second models did not favor the interaction model (chi2[4]=6.77, p=0.24), suggesting that the effects of MH, SA, and MHSA did not depend on safety decision. Consistent with this finding, the second and third models provided no evidence of significant interaction, although the marginally significant *OR*s associated with MHSA in these two models suggest that among "safe" households, MHSA households may be at higher risk of re-referral. Note that the coefficient associated with the Unsafe x MHSA term was not estimable because among households with no placements, none of the nine "unsafe" MHSA households was re-referred. Bonferroni-corrected pairwise comparisons are displayed in Table 3.16, and Figure 4, Panel E displays marginal predicted probabilities of re-referral by exposure group and safety decision.

Table 3.16
Odds Ratios Comparing Re-Referral Risk by Safety Decision and Exposure Group

	1	2	3	4	5	6	7	8	9	10	11	12
1. Safe x No MH or SA	1											
2. Safe x MH	1.15	1										
3. Safe x SA	1.37	1.19	1									
4. Safe x MHSA	2.26	1.97	1.65	1								
5. Safe with Plan x No MH or SA	1.04	0.91	0.76	0.46	1							
6. Safe with Plan x MH	0.80	0.70	0.59	0.35	0.77	1						
7. Safe with Plan x SA	0.92	0.81	0.68	0.41	0.89	1.15	1					
8. Safe with Plan x MHSA	1.34	1.17	0.98	0.59	1.29	1.67	1.45	1				
9. Unsafe x No MH or SA	0.42	0.36	0.31	0.18	0.40	0.52	0.45	0.31	1			
10. Unsafe x MH	0.69	0.60	0.50	0.30	0.66	0.86	0.75	0.52	1.65	1		
11. Unsafe x SA	1.03	0.90	0.76	0.46	1.00	1.29	1.12	0.77	2.47	1.50	1	
12. Unsafe x MHSA	-	-	-	-	-	-	-	-	-	-	-	1

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; analysis includes only households with no placements.
* $p \leq 0.0008$ (Bonferroni-corrected p-value)
- not estimable

Follow-up testing (see Table 3.17) provided no evidence of association between exposure and likelihood of *substantiated* re-referral within 12 months.

Table 3.17
Odds of Substantiated Re-Referral among Households Investigated for Maltreatment

	OR	95% CI
Final Decision		
Safe with Plan	1.42	(0.90, 2.24)
Unsafe	0.98	(0.11, 9.05)
Exposure		
MH	1.64	(0.71, 3.80)
SA	1.73	(0.86, 3.50)
MHSA	2.73	(0.70, 10.62)
Decision x Exposure		
Safe with Plan x MH	0.49	(0.11, 2.14)
Safe with Plan x SA	0.77	(0.28, 2.06)
Safe with Plan x MHSA	0.60	(0.12, 3.00)
Unsafe x MH	-	-
Unsafe x SA	-	-
Unsafe x MHSA	-	-
Youngest Child		
0-1	1.03	(0.66, 1.60)
2-5	0.98	(0.64, 1.50)
Child Race		
White	0.87	(0.52, 1.44)
Hispanic	0.91	(0.60, 1.39)
Asian	0.61†	(0.34, 1.07)
Mixed	1.22	(0.35, 4.21)
Year	0.95	(0.87, 1.04)
Mandated Reporter	1.62	(0.80, 3.29)
Total Children		
Child Referral History	1.27	(0.82, 1.96)
Child Capacity Problems		
Developmental		
Medical/Mental		
Physical		
Parent Arrest History	0.92	(0.54, 1.57)
Parent Childhood Maltreatment	0.87	(0.52, 1.44)
Housing Issues		

Total Allegations		
Allegation Type		
Substantial Risk	1.62	(0.79, 3.32)
Sibling Abused		
Sexual Abuse		
Severe Neglect		
Physical abuse	0.60*	(0.39, 0.92)
General Neglect	1.07	(0.72, 1.58)
Exploitation		
Emotional Abuse		
Absence/Incapacity		
Neglect Risk Score	1.13*	(1.02, 1.26)
Abuse Risk Score	0.93	(0.79, 1.09)
Any Substantiations		
Any Family Maintenance	0.70	(0.41, 1.22)
Intercept	0.04***	(0.02, 0.09)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for safety decision is "safe"; reference group for race is Black/African American; reference group for age is no child younger than six years old; blank table cells indicate variables that did not meet Benjamini-Hochberg-corrected significance threshold in bivariate analysis; analysis includes only households with no placements.
† $p \leq 0.10$
* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$
- not estimable

3.4. Discussion

This study examined associations between parental mental health and substance abuse statuses and risk of maltreatment allegation substantiations, case openings (including family maintenance and placements,) and re-referrals, while accounting for safety decision and adjusting for a range of case characteristics identified in the literature. Compared to prior studies, this analysis provides a more nuanced depiction of what happens to households affected by parental mental health problems or substance abuse after their initial safety assessments, and reveals interesting differences between exposure and comparison households by safety decision subgroup. Findings have the potential to guide assessment practices that workers use when investigating such households, and inform interventions that might reduce risk of re-referral.

Summary of Findings

Re-assessments. Consistent with hypothesis 1, households affected by parental mental health problems or substance abuse were more likely than comparison households to be re-assessed using the safety assessment during investigation. This finding may be a sign that

circumstances are more dynamic in these households, requiring more iterative investigative documentation during the referral window. Furthermore, they were more likely to have their initial safety decision changed to a more severe decision on re-assessment (e.g., "safe with plan" to "unsafe"), suggesting that among re-assessed households with MH, SA, or MHSA, workers tend to find more evidence of threats to child safety than was initially apparent.

Substantiations. Consistent with hypothesis 2, results show that households affected by parental mental health problems or substance abuse were generally more likely than comparison households to experience substantiations. When the interaction between safety decision and exposure was taken into account, however, results were inconsistent with hypothesis 3a. Results suggested that it is primarily among "safe" households that SA households are at significantly greater risk of substantiation than comparison households. Consistent with hypothesis 3c, when the threat to child safety is high, parental mental health problems and substance abuse matter less.

FCS explained that allegation substantiation can occur following a "safe" decision if workers subsequently document evidence of maltreatment that was not identified on the safety assessment. Among "safe" SA households, the most commonly substantiated allegation was general neglect (25%). Taken together with results from the multivariate substantiation models, this evidence suggests that workers who found SA households "safe" were more likely to document other evidence of maltreatment during subsequent investigative work, leading to the substantiation of an allegation—most often, general neglect. This may speak to the complex and dynamic nature of referrals involving parental substance abuse, where household circumstances may appear safe one day but not the next. Alternatively, this may suggest that other methods of gathering and documenting evidence of maltreatment (in this case general neglect,) may offer a more comprehensive perspective on child safety than the safety assessment's safety threat inventory alone. If the latter is true, i.e., if evidence leading to allegation substantiation is not documented with sufficient clarity or detail on the safety assessment, providers may wish to develop a system or documenting such evidence as a means of better accounting for the allegation's disposition. These findings also suggest that among "safe" households with documented parental substance abuse and substantiated allegations, addressing general neglect is a priority. This may mean linking parents to financial and material resources and establishing or re-establishing behavioral health services for the purpose of rehabilitating caregiving skills that may be impacted by substance abuse.

Family Maintenance. Consistent with hypothesis 2, results show that households affected by parental mental health problems or substance abuse were generally more likely than comparison households to receive family maintenance services. When the interaction between safety decision and exposure was taken into account, results suggested that it is primarily among "safe" households that these households are more likely to receive family maintenance services; among unsafe households, parental mental health problems and substance abuse are associated with a lower likelihood of these services. The majority of "safe" households that received family maintenance had a substantiated allegation, which accounts for why workers might initiate these services.

Among the remaining n=45 households with no substantiated allegations, further review of the records indicated that family maintenance cases were generally opened on a voluntary basis. As previously noted, a family maintenance case may also be opened for a household with no substantiations if a worker is concerned about risk of future maltreatment. These two reasons need not be mutually exclusive; parents might voluntarily accept family maintenance services

from a worker who is concerned about the high risk of future maltreatment. Most (64%) of these households had a risk level of "low" or "medium" though, suggesting that a worker's concern about future maltreatment may not have been the primary reason services were initiated.

Among "safe with plan" households (see Table 3.11), those with parental mental health problems are more than four times as likely to receive family maintenance services than comparison households. This suggests that when threats are documented in the home but a safety plan can be put in place, workers are more likely to also initiate family maintenance services if parental mental health problems are present. The same table also shows that among "unsafe" households, those with mental health problems and substance abuse are 90% less likely to receive family maintenance services than comparison households. This suggests that when workers believe a child is not safe in the home, they may be less likely to think that family maintenance services are a feasible alternative to placement if both parental mental health problems and substance abuse are present.

Taken together, these findings suggest that workers generally take more precautions when working with households in which parental mental health problems and/or substance abuse are present. This finding echoes the point raised by Radel et al. (2018), namely that workers are liable to err on the side of safety when considering voluntary versus non-voluntary services. However, findings also suggest that parents with substance abuse may also be more accepting of voluntary family maintenance services even if no current evidence of maltreatment is documented, perhaps because they view these "near-misses" as wake-up calls to seek help. Engaging parents in this way may be a method of addressing concerns without mandating oversight.

Placements. Results show that households affected by parental substance abuse alone were generally more likely than comparison households to have a placement, partially supporting hypothesis 2. When the interaction between safety decision and exposure was taken into account, results suggested that it is primarily among "safe" households that households with parental health problems or substance abuse (but not both) are more likely to have a placement. There were few differences by exposure group relative to comparison households in the likelihood of placement when the decision was "safe with plan" or "unsafe." Consistent with hypothesis 3c, as the threat to child safety rises, parental mental health problems and substance use matter less.

As shown in Table 3.11, "safe" households typically experienced placements either because an allegation was eventually substantiated or because the household was re-referred within a short time of the initial referral, and that re-referral triggered a placement. That households with parental mental health problems or substance abuse were more likely to be in this group is consistent with the prior observation that these parental issues tend to be documented in households with complex, dynamic family circumstances. When workers have more contact with these households, they tend to find more evidence of maltreatment that ultimately increases the child's likelihood of being placed out-of-home.

Re-referrals. Consistent with hypothesis 2, there was little evidence the parental mental health problems or substance abuse increased the likelihood of re-referral after adjusting for relevant variables. These results make sense for several reasons. First, more "unsafe" households with parental mental health problems or substance abuse had placements than did "unsafe" households with neither of these issues; this means that in the re-referral sample (which excluded households with placements,) the proportion of risky households with neither parental mental health problems nor substance abuse was larger than the proportion of risky households with one or both of these issues. Second, "safe" and "safe with plan" households with parental mental

health problems or substance abuse were more likely to receive family maintenance services than households with neither of these issues, meaning that the latter were more likely to have unaddressed maltreatment than the former. Together, these factors contribute to the non-significant differences by exposure group in the likelihood of re-referral. This is not necessarily a positive finding, however. Whereas our hope would be that family maintenance services reduce risk of re-referral, findings suggest that even with higher rates of family maintenance services, parents with mental health problems or substance abuse are still as likely to be re-referred as parents with neither of these issues. Moreover, family maintenance services were associated with significantly higher, not lower, odds of re-referral in bivariate analyses, and in adjusted models, they were not significantly associated with re-referral.

Taken together, this evidence suggests that for parents with mental health problems or substance abuse, family maintenance services may be doing just enough in terms of re-referral risk. Similar to the argument put forth by Putnam-Hornstein, et al. (2015), adequate but non-optimal services rendered to a higher-risk group are unlikely to reduce risk of re-referral below the average rate. The present analysis suggests at least that they may level the playing field for parents with mental health problems or substance abuse.

Limitations

The presented analysis, though robust in its use of large longitudinal administrative datasets, empirically-derived adjustment variables, and multiple testing corrections, is subject to some limitations. The study sample is limited to one jurisdiction and therefore findings may not be generalizable to others for reasons of ecology, policy, and practice. Indeed, some effects may be better explained by county socioeconomic factors or the local child welfare culture—especially given that San Francisco's child welfare authority, unlike that of many other jurisdictions, is county-operated and state-supervised.

3.5. Conclusions

Results from analyses corroborate prior evidence that child welfare-involved households affected by parental mental health problems or substance abuse tend to penetrate the system further than households without such issues. The added value of the study is that it reveals the nuances of how these parents and their children move through the system following safety assessment. As anticipated, the complexity of their households often leads to re-assessments and re-referrals, the majority of which tend to document a grimmer depiction of what children are enduring. The result is that when parental mental health problems or substance abuse are present, workers tend to proceed more cautiously. Even when they determine that children may remain in the home, workers are ultimately more likely to substantiate allegations, initiate family maintenance services, and remove children, generally because new evidence of maltreatment comes to light in the process. These findings suggest that modifications to investigative procedures may be warranted when working with parents experiencing mental health problems or substance abuse. Iterative assessments may be necessary, and the timeline to referral closure should be accordingly flexible. Perhaps most importantly, though, findings suggest that providers may be effectively reducing risk of recurrence through the use of family maintenance services, as neither parental mental health problems nor substance abuse were predictive of re-referral within 12 months.

Overall Conclusions

For maltreatment-referred children in San Francisco, parental mental health problems and substance abuse mean deeper penetration into the child welfare system, as has been similarly documented in a range of empirical studies nationwide and abroad. This dissertation is among very few, however, to use administrative child welfare data to examine decision-making at the ground level. In so doing, dissertation analyses helped identify why these children are more likely to be determined unsafe in the home, what prevents them from being removed despite threats to safety, and what happens to them following these critical safety decisions.

Chapter 1 found that children of parents with mental health problems and substance abuse are determined unsafe in the home primarily due to unmet immediate needs, previous maltreatment, prenatal exposure to substances, and other miscellaneous safety threats associated with mental health issues. Chapter 2 showed that among households with immediate threats to child safety, increasing numbers of family protective factors mitigated the risk that children would be removed from the home, with several factors demonstrating individual protective properties above and beyond the cumulative effect. Chapter 3 provided an in-depth portrayal of what happens to children of parents with mental health problems or substance abuse following their initial safety assessment. These households were more likely to be re-assessed and re-referred within days of their initial referrals. They were also more likely to have allegations substantiated, receive in-home services, and be placed out-of-home. Moreover, the likelihood of these outcomes was specifically higher among children whom workers had only recently determined could remain safely in the home. Surprisingly, parents of these children were no more likely to be re-referred than comparison parents, suggesting that in-home services may be effectively addressing maltreatment concerns.

In the context of the national conversation about parental substance abuse, mental health, and maltreatment, dissertation findings provide insight into additions and modifications that providers can make to existing investigative and intervention practices. Resource referrals should be undertaken at the outset of contact with a household in which parental substance abuse or mental health problems are documented, given high levels of unmet immediate needs in these households. When investigating allegations of maltreatment, providers should prioritize and standardize documentation of behaviors that constitute threats to child safety in order that decision-making not be prejudiced by stereotype or stigma. Providers should plan for complexity when investigating these households by recommending protocols that iterate assessments of child safety and allow for more flexible referral closure timelines.

When serving households affected by parental mental health problems or substance abuse, providers should be aware of the protective value of parent and child capacity-building modules in the context of existing intervention protocols, with a focus on remediating psychological and cognitive deficits associated with parental mental health problems and substance abuse as they relate to caregiving skills, and training children how to recognize and safely respond to escalating household circumstances. Likewise, awareness of the under-report of domestic violence among individuals with mental health problems should cue providers to the importance of building parents' capacity to respond protectively to threats posed by partners. Where these capacity-building modules are not yet represented, providers should consider methods of studying their effectiveness as additive elements to routine practice.

Taken together, dissertation analyses describe a population of parents and children that, despite higher odds of more serious child welfare involvement, has the potential to recover

through service provision and the cultivation of family protective factors. When applied to child welfare practice, findings may stimulate and guide efforts to serve families with a greater degree of fairness and effectiveness. Such practice improvement can only help to spare children the trauma of maltreatment recurrence and, moreover, support their healthy development and resilience.

References

Administration for Children and Families, & U. S. Department of Health & Human Services. (2016). *Child maltreatment 2014*.

Administration for Children and Families, & U.S. Department of Health and Human Services. (n.d.). *Title IV- E Prevention Services Clearinghouse*. https://preventionservices.abtsites.com

Andershed, A.-K., Gibson, C. L., & Andershed, H. (2016). The role of cumulative risk and protection for violent offending. *Journal of Criminal Justice*, *45*, 78–84. https://doi.org/10.1016/j.jcrimjus.2016.02.006

Arad-Davidzon, B., Englechin-Segal, D., Wozner, Y., & Arieli, R. (2006). Social Workers' Decisions on Removal. *Journal of Social Service Research*, *31*(4), 1–23. https://doi.org/10.1300/J079v31n04_01

Azar, S. T., Maggi, M. C., & Proctor, S. N. (2013). Practices Changes in the Child Protection System to Address the Needs of Parents With Cognitive Disabilities. *Journal of Public Child Welfare*, *7*(5), 610. https://doi.org/10.1080/15548732.2013.857630

Azar, S. T., & Read, K. N. (2009). *Parental Cognitive Disabilities and Child Protection Services: The Need for Human Capacity Building [article]*.

Azar, S. T., Stevenson, M. T., & Johnson, D. R. (2012). Intellectual Disabilities and Neglectful Parenting: Preliminary Findings on the Role of Cognition in Parenting Risk. *Journal of Mental Health Research in Intellectual Disabilities*, *5*(2), 94–129. https://doi.org/10.1080/19315864.2011.615460

Baird, C., Wagner, D., Caskey, R., & Neuenfeldt, D. (1995). *The Michigan Department of Social Services structured decision making system: An evaluation of its impact on child protection services*. Children's Research Center.

Barth, R. P. (2009). Preventing Child Abuse and Neglect with Parent Training: Evidence and Opportunities. *The Future of Children*, *19*(2), 95–118. JSTOR.

Bartlett, J. D., & Easterbrooks, M. A. (2015). The moderating effect of relationships on intergenerational risk for infant neglect by young mothers. *Child Abuse & Neglect*, *45*, 21–34. https://doi.org/10.1016/j.chiabu.2015.02.018

Benjamini, Y., & Hochberg, Y. (1995). Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing. *Journal of the Royal Statistical Society. Series B (Methodological)*, *57*(1), 289–300.

Bonanno, G. A., Galea, S., Bucciarelli, A., & Vlahov, D. (2007). What predicts psychological resilience after disaster? The role of demographics, resources, and life stress. *Journal of Consulting and Clinical Psychology*, *75*, 671–682.

Bowen, N. K., & Flora, D. B. (2002). When Is It Appropriate to Focus on Protection in Interventions for Adolescents? *American Journal of Orthopsychiatry*, *72*(4), 526–538. https://doi.org/10.1037/0002-9432.72.4.526

Britner, P. A., & Mossler, D. G. (2002). Professionals' decision-making about out-of-home placements following instances of child abuse. *Child Abuse and Neglect*, *26*(4), 317–332.

Brown, J., Cohen, P., Johnson, J. G., & Salzinger, S. (1998). A longitudinal analysis of risk factors for child maltreatment: Findings of a 17-year prospective study of officially recorded and self-reported child abuse and neglect. *Child Abuse and Neglect*, *22*(11), 1065–1078.

California Department of Social Services. (n.d.). *Structured decision making*. Retrieved March 8, 2019, from http://www.cdss.ca.gov/inforesources/Child-Welfare-Protection/Structured-Decision-Making

Carlile, J. B. (1991). Spouse Assault on Mentally Disordered Wives. *The Canadian Journal of Psychiatry*, *36*(4), 265–269. https://doi.org/10.1177/070674379103600405

Carney, C. P., Jones, L., & Woolson, R. F. (2006). Medical comorbidity in women and men with schizophrenia: A population-based controlled study. *Journal of General Internal Medicine*, *21*(11), 1133–1137. https://doi.org/10.1111/j.1525-1497.2006.00563.x

Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. S., & Hawkins, J. D. (2004). Positive Youth Development in the United States: Research Findings on Evaluations of Positive Youth Development Programs. *The ANNALS of the American Academy of Political and Social Science*, *591*(1), 98–124. https://doi.org/10.1177/0002716203260102

Center for Behavioral Health Statistics and Quality, & Substance Abuse and Mental Health Services Administration. (2016). *2015 National Survey on Drug Use and Health: Detailed Tables*.

Center for Behavioral Health Statistics and Quality, & Substance Abuse and Mental Health Services Administration. (2018). *2017 National Survey on Drug Use and Health: Detailed Tables*.

Chaffin, M., & Friedrich, B. (2004). Evidence-based treatments in child abuse and neglect. *Children and Youth Services Review*, *26*, 1097–1113.

Chaffin, M., Kelleher, K., & Hollenberg, J. (1996). Onset of physical abuse and neglect: Psychiatric, substance abuse, and social risk factors from prospective community data. *Child Abuse and Neglect*, *20*(3), 191–203.

Cicchetti, D., & Lynch, M. (1993). Toward an Ecological/Transactional Model of Community Violence and Child Maltreatment: Consequences for Children's Development. *Psychiatry*, *56*(1), 96–118. https://doi.org/10.1080/00332747.1993.11024624

Cicchetti, D., Rogosch, F. A., Lynch, M., & Holt, K. D. (1993). Resilience in maltreated children: Processes leading to adaptive outcome. *Development and Psychopathology*, *5*(4), 629–647. https://doi.org/10.1017/S0954579400006209

Collishaw, S., Hammerton, G., Mahedy, L., Sellers, R., Owen, M. J., Craddock, N., Thapar, A. K., Harold, G. T., Rice, F., & Thapar, A. (2016). Mental health resilience in the adolescent offspring of parents with depression: A prospective longitudinal study. *Lancet Psychiatry*, *3*(1), 49–57. https://doi.org/10.1016/s2215-0366(15)00358-2

Collishaw, S., Pickles, A., Messer, J., Rutter, M., Shearer, C., & Maughan, B. (2016). Resilience to adult psychopathology following childhood maltreatment: Evidence from a community sample. *Child Abuse and Neglect*, *31*(3), 211–229. http://dx.doi.org/10.1016/j.chiabu.2007.02.004

Corrigan, P. W., Druss, B. G., & Perlick, D. A. (2014). The Impact of Mental Illness Stigma on Seeking and Participating in Mental Health Care. *Psychological Science in the Public Interest*, *15*(2), 37–70. https://doi.org/10.1177/1529100614531398

Cross, T. P., & Casanueva, C. (2009). Caseworker Judgments and Substantiation. *Child Maltreatment*, *14*(1), 38–52. https://doi.org/10.1177/1077559508318400

Crouch, J. L., Milner, J. S., & Thomsen, C. (2001). Childhood physical abuse, early social support, and risk for maltreatment: Current social support as a mediator of risk for child physical abuse☆11☆ The research for this paper was conducted as part of the first author's fulfillment of the requirements for the doctoral degree and was under the

direction of the second author. *Child Abuse & Neglect*, *25*(1), 93–107. https://doi.org/10.1016/S0145-2134(00)00230-1

Currie, J., & Spatz Widom, C. (2010). Long-Term Consequences of Child Abuse and Neglect on Adult Economic Well-Being. *Child Maltreatment*, *15*(2), 111–120. https://doi.org/doi:10.1177/1077559509355316

Das-Munshi, J., Chang, C.-K., Dutta, R., Morgan, C., Nazroo, J., Stewart, R., & Prince, M. J. (2017). Ethnicity and excess mortality in severe mental illness: A cohort study. *The Lancet Psychiatry*. https://doi.org/10.1016/S2215-0366(17)30097-4

De Bellis, M. D., Broussard, E. R., Herring, D. J., Wexler, S., Moritz, G., & Benitez, J. G. (2001). Psychiatric co-morbidity in caregivers and children involved in maltreatment: A pilot research study with policy implications. *Child Abuse and Neglect*, *25*(7), 923–944.

DePanfilis, D., & Scannapieco, M. (1994). Assessing the safety of children at risk of maltreatment: Decision-making models. *Child Welfare*, *73*(3), 229–245.

DePanfilis, D., & Zuravin, S. J. (2001). Assessing risk to determine the need for services. *Children and Youth Services Review*, *23*(1), 3–20. https://doi.org/10.1016/S0190-7409(00)00125-0

Dixon, L., Browne, K., & Hamilton-Giachritsis, C. (2009). Patterns of risk and protective factors in the intergenerational cycle of maltreatment. *Journal of Family Violence*, *24*(2), 111–122.

Dorsey, S., Mustillo, S. A., Farmer, E. M. Z., & Elbogen, E. (2008). Caseworker assessments of risk for recurrent maltreatment: Association with case-specific risk factors and re-reports. *Child Abuse & Neglect*, *32*(3), 377–391. https://doi.org/10.1016/j.chiabu.2007.06.006

Drapalski, A. L., Lucksted, A., Perrin, P. B., Aakre, J. M., Brown, C. H., DeForge, B. R., & Boyd, J. E. (2013). A Model of Internalized Stigma and Its Effects on People With Mental Illness. *Psychiatric Services*, *64*(3), 264–269. https://doi.org/10.1176/appi.ps.001322012

Druss, B. G., Hwang, I., Petukhova, M., Sampson, N. A., Wang, P. S., & Kessler, R. C. (2009). Impairment in role functioning in mental and chronic medical disorders in the United States: Results from the National Comorbidity Survey Replication. *Molecular Psychiatry*, *14*(7), 728–737. https://doi.org/10.1038/mp.2008.13

Druss, B. G., Marcus, S. C., Campbell, J., Cuffel, B., Harnett, J., Ingoglia, C., & Mauer, B. (2008). *Medical Services for Clients in Community Mental Health Centers: Results From a National Survey*. *59*(8), 4.

DuMont, K. A., Widom, C. S., & Czaja, S. J. (2007). Predictors of resilience in abused and neglected children grown-up: The role of individual and neighborhood characteristics. *Child Abuse & Neglect*, *31*(3), 255–274. https://doi.org/10.1016/j.chiabu.2005.11.015

Eastman, A. L., Mitchell, M. N., & Putnam-Hornstein, E. (2016). Risk of re-report: A latent class analysis of infants reported for maltreatment. *Child Abuse & Neglect*, *55*, 22–31. https://doi.org/10.1016/j.chiabu.2016.03.002

English, D. J., Marshall, D. B., Brummel, S., & Orme, M. (1999). Characteristics of Repeated Referrals to Child Protective Services in Washington State. *Child Maltreatment*, *4*(4), 297–307. https://doi.org/10.1177/1077559599004004003

English, D. J., Marshall, D. B., Coghlan, L., Brummel, S., & Orme, M. (2002). Causes and Consequences of the Substantiation Decision in Washington State Child Protective Services. *Children and Youth Services Review*, *24*(11), 817–851. https://doi.org/10.1016/S0190-7409(02)00241-4

Fallon, B., Ma, J., Black, T., & Wekerle, C. (2011). Characteristics of Young Parents Investigated and Opened for Ongoing Services in Child Welfare. *International Journal of Mental Health and Addiction*, *9*(4), 365–381. https://doi.org/10.1007/s11469-011-9342-5

Family First Prevention Services Act, no. 1892, 115th Congress (2017-2018) (2018).

Fang, X., Brown, D. S., Florence, C. S., & Mercy, J. A. (2012). The economic burden of child maltreatment in the United States and implications for prevention. *Child Abuse and Neglect*, *36*(2), 156–165. http://dx.doi.org/10.1016/j.chiabu.2011.10.006

Gelles, R. J. (2017). *Out of harm's way creating an effective child welfare system*.

Ghertner, R., Baldwin, M., Crouse, G., Radel, L., & Waters, A. (2018). The relationship between substance use indicators and child welfare caseloads. *Foster Care*, *300*, 350–000.

Gilbert, R., Widom, C. S., Browne, K., Fergusson, D., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *The Lancet*, *373*(9657), 68–81. https://doi.org/10.1016/S0140-6736(08)61706-7

Gillingham, P. (2011). Decision-making tools and the development of expertise in child protection practitioners: Are we 'just breeding workers who are good at ticking boxes'? *Child & Family Social Work*, *16*(4), 412–421. https://doi.org/10.1111/j.1365-2206.2011.00756.x

Gillingham, P., & Humphreys, C. (2009). Child protection practitioners and decision-making tools: Observations and reflections from the front line. *British Journal of Social Work*, *40*(8), 2598–2616.

Goldiamond, I. (1974). Toward a Constructional Approach to Social Problems: Ethical and Constitutional Issues Raised by Applied Behavior Analysis. *Behaviorism*, *2*(1), 1–84. JSTOR.

Golding, J. M. (1999). Intimate Partner Violence as a Risk Factor for Mental Disorders: A Meta-Analysis. *Journal of Family Violence*, *14*(2), 99–132. https://doi.org/10.1023/A:1022079418229

Goodman, S. H., & Gotlib, I. H. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review*, *106*(3), 458–490.

Graham, J. C., Dettlaff, A. J., Baumann, D. J., & Fluke, J. D. (2015). The Decision Making Ecology of placing a child into foster care: A structural equation model. *Child Abuse & Neglect*, *49*, 12–23. https://doi.org/10.1016/j.chiabu.2015.02.020

Greenberg, M. T., Domitrovich, C., & Bumbarger, B. (2001). The prevention of mental disorders in school-aged children: Current state of the field. *Prevention & Treatment*, *4*(1), 1a.

Griffin, K. W., Scheier, L. M., Botvin, G. J., & Diaz, T. (2000). Ethnic and Gender Differences in Psychosocial Risk, Protection, and Adolescent Alcohol Use. *Prevention Science*, *1*(4), 199–212. https://doi.org/10.1023/A:1026599112279

Hegarty, K. (2011). Domestic violence: The hidden epidemic associated with mental illness. *The British Journal of Psychiatry*, *198*(3), 169–170. https://doi.org/10.1192/bjp.bp.110.083758

Henggeler, S. W., Schoenwald, S. K., Borduin, C. M., Rowland, M. D., & Cunningham, P. B. (1998). *Multisystemic treatment of antisocial behavior in children and adolescents*. Guilford Press.

Herrenkohl, T. I., Tajima, E. A., Whitney, S. D., & Huang, B. (2005). Protection against antisocial behavior in children exposed to physically abusive discipline. *Journal of Adolescent Health*, *36*(6), 457–465. https://doi.org/10.1016/j.jadohealth.2003.09.025

Hobfoll, S. E., Palmieri, P. A., Johnson, R. J., Canetti-Nisim, D., Hall, B. J., & Galea, S. (2009). Trajectories of resilience, resistance, and distress during ongoing terrorism: The case of Jews and Arabs in Israel. *Journal of Consulting and Clinical Psychology*, *77*, 138–148.

Hollingsworth, L. D. (2004). Child custody loss among women with persistent severe mental illness. *Social Work Research*, *28*(4), 199.

Howard, L. M., Trevillion, K., Khalifeh, H., Woodall, A., Agnew-Davies, R., & Feder, G. (2010). Domestic violence and severe psychiatric disorders: Prevalence and interventions. *Psychological Medicine*, *40*(6), 881–893. https://doi.org/10.1017/S0033291709991589

Jaffee, S. R., Caspi, A., Moffitt, T. E., Polo-Tomás, M., & Taylor, A. (2007). Individual, family, and neighborhood factors distinguish resilient from non-resilient maltreated children: A cumulative stressors model. *Child Abuse & Neglect*, *31*(3), 231–253. https://doi.org/10.1016/j.chiabu.2006.03.011

Jessor, R., Van Den Bos, J., Vanderryn, J., Costa, F. M., & Turbin, M. S. (1995). Protective factors in adolescent problem behavior: Moderator effects and developmental change. *Developmental Psychology*, *31*(6), 923–933. https://doi.org/10.1037/0012-1649.31.6.923

Jewell, N. (2004). *Statistic for epidemiology*. Chapman & Hall.

Johnson, W. (2004). Effectiveness of California's child welfare structured decision making (SDM) model: A prospective study of the validity of the California Family Risk Assessment. *Madison (Wisconsin, USA): Children's Research Center*.

Kim, H., Jonson-Reid, M., Kohl, P., Chiang, C., Drake, B., Brown, D., McBride, T., & Guo, S. (2020). Latent class analysis risk profiles: An effective method to predict a first re-report of maltreatment? *Evaluation and Program Planning*, *80*, 101792. https://doi.org/10.1016/j.evalprogplan.2020.101792

King, B., Lawson, J., & Putnam-Hornstein, E. (2013). Examining the Evidence: Reporter Identity, Allegation Type, and Sociodemographic Characteristics as Predictors of Maltreatment Substantiation. *Child Maltreatment*, *18*(4), 232–244. https://doi.org/10.1177/1077559513508001

Knight, K. R. (2015). *Addicted. Pregnant. Poor*.

Lansford, J. E., Dodge, K. A., Pettit, G. S., Bates, J. E., Crozier, J., & Kaplow, J. (2002). A 12-year prospective study of the long-term effects of early child physical maltreatment on psychological, behavioral, and academic problems in adolescence. *Archives of Pediatrics and Adolescent Medicine*, *156*(8), 824–830. https://doi.org/10.1001/archpedi.156.8.824

Leslie, L. K., Mehus, C. J., Hawkins, J. D., Boat, T., McCabe, M. A., Barkin, S., Perrin, E. C., Metzler, C. W., Prado, G., Tait, V. F., Brown, R., & Beardslee, W. R. (2016). Primary Health Care: Potential Home for Family-Focused Preventive Interventions. *American Journal of Preventive Medicine*, *51*(4, Supplement 2), S106–S118. http://dx.doi.org/10.1016/j.amepre.2016.05.014

Li, F., Godinet, M. T., & Arnsberger, P. (2011). Protective factors among families with children at risk of maltreatment: Follow up to early school years. *Children and Youth Services Review*, *33*(1), 139–148.

Lindell, K. U., Sorenson, C. K., & Mangold, S. V. (2020). The Family First Prevention Services Act: A New Era of Child Welfare Reform. *Public Health Reports*, *135*(2), 282–286. https://doi.org/10.1177/0033354919900892

Lindsey, D. (1991). Factors affecting the foster care placement decision: An analysis of national survey data. *American Journal of Orthopsychiatry*, *61*(2), 272–281. https://doi.org/10.1037/h0085011

Luthar, S. S. (1991). Vulnerability and resilience: A study of high-risk adolescents. *Child Development*, *62*, 600–616.

Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The Construct of Resilience: A Critical Evaluation and Guidelines for Future Work. *Child Development*, *71*, 543–562.

Luthar, S. S., Doernberger, C. H., & Zigler, E. (1993). Resilience is not a unidimensional construct: Insights from a prospective study of inner-city adolescents. *Development and Psychopathology*, *5*, 703–717.

Lyle, C. G., & Graham, E. (2000). Looks can be deceiving: Using a risk assessment instrument to evaluate the out-comes of child protection services. *Children and Youth Services Review*, *22*(11), 935–949. https://doi.org/10.1016/S0190-7409(00)00119-5

MacKenzie, M. J., Kotch, J. B., & Lee, L.-C. (2011). Toward a cumulative ecological risk model for the etiology of child maltreatment. *Children and Youth Services Review*, *33*(9), 1638–1647. https://doi.org/10.1016/j.childyouth.2011.04.018

Malhotra, M., Kumar, D., & Verma, R. (2015). Effect of psychosocial environment in children having mother with schizophrenia. *Psychiatry Research*, *226*, 418–424. https://doi.org/10.1016/j.psychres.2014.11.028

Mangurian, C., Schillinger, D., Newcomer, J. W., Vittinghoff, E., Essock, S., Zhu, Z., Dyer, W., Young-Wolff, K. C., & Schmittdiel, J. (2020). Comorbid Diabetes and Severe Mental Illness: Outcomes in an Integrated Health Care Delivery System. *Journal of General Internal Medicine*, *35*(1), 160–166. https://doi.org/10.1007/s11606-019-05489-3

Marshall, D. B., & English, D. J. (1999). Survival Analysis of Risk Factors for Recidivism in Child Abuse and Neglect. *Child Maltreatment*, *4*(4), 287–296. https://doi.org/10.1177/1077559599004004002

Martin, A., Gardner, M., & Brooks-Gunn, J. (2012). The Mediated and Moderated Effects of Family Support on Child Maltreatment. *Journal of Family Issues*, *33*(7), 920–941. https://doi.org/10.1177/0192513X11431683

Masten, A. S. (2001). Ordinary Magic: Resilience Processes in Development. *American Psychologist*, *56*, 227–238.

Masten, A. S. (2015). *Ordinary magic: Resilience in development*. The Guilford Press.

Masten, A. S., Hubbard, J. J., Gest, S. D., Tellegen, A., Garmezy. Norman, & Ramirez, M. (1999). Competence in the context of adversity: Pathways to resilience and maladaptation from childhood to late adolescence. *Development and Psychopathology*, *11*, 143–169.

Masten, A. S., & Tellegen, A. (2012). Resilience in developmental psychopathology: Contributions of the project competence longitudinal study. *Development and Psychopathology*, *24*(02), 345–361.

Masten, A. S., & Wright, M. O. (1998). Cumulative Risk and Protection Models of Child Maltreatment. *Journal of Aggression, Maltreatment & Trauma*, *2*(1), 7–30. https://doi.org/10.1300/J146v02n01_02

McDaniel, M. (2006). In the eye of the beholder: The role of reporters in bringing families to the attention of child protective services. *Children and Youth Services Review*, *28*(3), 306–324. https://doi.org/10.1016/j.childyouth.2005.04.010

McGurk, S. R., Twamley, E. W., Sitzer, D. I., McHugo, G. J., & Mueser, K. T. (2007). A Meta-Analysis of Cognitive Remediation in Schizophrenia. *American Journal of Psychiatry*, *164*(12), 1791–1802. https://doi.org/10.1176/appi.ajp.2007.07060906

McLaughlin, K. A., Gadermann, A. M., Hwang, I., Sampson, N. A., Al-Hamzawi, A., Andrade, L. H., Angermeyer, M. C., Benjet, C., Bromet, E. J., Bruffaerts, R., Caldas-de-Almeida, J. M., de Girolamo, G., de Graaf, R., Florescu, S., Gureje, O., Haro, J. M., Hinkov, H. R., Horiguchi, I., Hu, C., … Kessler, R. C. (2012). Parent psychopathology and offspring mental disorders: Results from the WHO World Mental Health Surveys. *The British Journal of Psychiatry*, *200*(4), 290–299. https://doi.org/10.1192/bjp.bp.111.101253

Miller, B. J., Paschall, C. B., & Svendsen, D. P. (2008). Mortality and Medical Comorbidity Among Patients With Serious Mental Illness. *Focus*, *6*(2), 239–245. https://doi.org/doi:10.1176/foc.6.2.foc239

Miller, K. M., Orellana, E. R., Briggs, H. E., & Quinn, A. (2014). Influence of Caregiver Substance Dependence and Serious Mental Illness on Children's Mental Health: Moderating Effects of Social Support. *Child and Adolescent Social Work Journal*, *31*(5), 435–454. https://doi.org/10.1007/s10560-014-0326-8

Motter, J. N., Pimontel, M. A., Rindskopf, D., Devanand, D. P., Doraiswamy, P. M., & Sneed, J. R. (2016). Computerized cognitive training and functional recovery in major depressive disorder: A meta-analysis. *Journal of Affective Disorders*, *189*, 184–191. https://doi.org/10.1016/j.jad.2015.09.022

Mowbray, C. T., Lewandowski, L., Bybee, D., & Oyserman, D. (2004). Children of mothers diagnosed with serious mental illness: Patterns and predictors of service use. *Mental Health Services Research*, *6*(3), 167–183.

Mowbray, C. T., Oyserman, D., Bybee, D., MacFarlane, P., & Rueda-Riedle, A. (2001). Life circumstances of mothers with serious mental illnesses. *Psychiatric Rehabilitation Journal*, *25*(2), 114.

Mrazek, P. J., & Haggerty, R. J. (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research*. National Academy Press.

Mullick, M., Miller, L. J., & Jacobsen, T. (2001). Insight into mental illness and child maltreatment risk among mothers with major psychiatric disorders. *Psychiatric Services*, *52*(4), 488–492.

Muthén, B. O. (1984). A general structural equation model with dichotomous, ordered categorical, and continuous latent variable indicators. *Psychometrika*, *49*(1), 115–132. https://doi.org/10.1007/bf02294210

Muthén, B. O., du Toit, S. H. C., & Spisic, D. (1997). *Robust inference using weighted least squares and quadratic estimating equations in latent variable modeling with categorical and continuous outcomes. (Unpublished technical report)*.

California Safety Assessment, (2012) (testimony of National Council on Crime and Delinquency; Children's Research Center & California Department of Social Services).

The Structured Decision Making® System Policy and Procedures Manual, (2015) (testimony of National Council on Crime and Delinquency; Children's Research Center & California Department of Social Services).

Nicholson, J., Biebel, K., & Katz-Leavy, J. (2002). Prevalence of parenthood among adults with severe mental illness: Implications for state and federal policymakers, programs, and providers. *Psychiatry Publications and Presentations*.

O'Donnell, M., Maclean, M. J., Sims, S., Morgan, V. A., Leonard, H., & Stanley, F. J. (2015). Maternal mental health and risk of child protection involvement: Mental health diagnoses associated with increased risk. *J Epidemiol Community Health*, *69*(12), 1175–1183. https://doi.org/10.1136/jech-2014-205240

Park, J. M., Solomon, P., & Mandell, D. S. (2006). Involvement in the child welfare system among mothers with serious mental illness. *Psychiatric Services*, *57*(4), 493–497. https://doi.org/10.1176/ps.2006.57.4.493

Pecora, P. J. (1991). Investigating Allegations of Child Maltreatment. *Child & Youth Services*, *15*(2), 73–92. https://doi.org/10.1300/J024v15n02_05

Peterson, C., Florence, C., & Klevens, J. (2018). The economic burden of child maltreatment in the United States, 2015. *Child Abuse & Neglect*, *86*, 178–183. https://doi.org/10.1016/j.chiabu.2018.09.018

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879–891.

Probst, B. (2009). Contextual Meanings of the Strengths Perspective for Social Work Practice in Mental Health. *Families in Society*, *90*(2), 162–166. https://doi.org/10.1606/1044-3894.3876

Putnam-Hornstein, E., Needell, B., King, B., & Johnson-Motoyama, M. (2013). Racial and ethnic disparities: A population-based examination of risk factors for involvement with child protective services. *Child Abuse and Neglect*, *37*(1), 33–46. https://doi.org/10.1016/j.chiabu.2012.08.005

Putnam-Hornstein, E., Simon, J. D., Eastman, A. L., & Magruder, J. (2015). Risk of Re-Reporting Among Infants Who Remain at Home Following Alleged Maltreatment. *Child Maltreatment*, *20*(2), 92–103. https://doi.org/10.1177/1077559514558586

Radel, L., Baldwin, M., Crouse, G., Ghertner, R., & Waters, A. (2018). Substance use, the opioid epidemic, and the child welfare system: Key findings from a mixed methods study. *Office of the Assistant Secretary for Planning and Evaluation*.

Rapaport, E. (2006). Mad women and desperate girls: Infanticide and child murder in law and myth. *Fordham Urban Law Journal*, *2*, 527.

Roscoe, J. N., Lery, B., & Chambers, J. E. (2018). Understanding child protection decisions involving parents with mental illness and substance abuse. *Child Abuse and Neglect*, *81*, 235–248. https://doi.org/10.1016/j.chiabu.2018.05.005

Rossi, P. H., Schuerman, J., & Budde, S. (1999). Understanding Decisions about Child Maltreatment. *Evaluation Review*, *23*(6), 579–598. https://doi.org/doi:10.1177/0193841X9902300601

Russell, B. S., Lee, J. O., Spieker, S., & Oxford, M. L. (2016). Parenting and Preschool Self-Regulation as Predictors of Social Emotional Competence in 1st Grade. *Journal of Research in Childhood Education*, *30*(2), 153–169. https://doi.org/10.1080/02568543.2016.1143414

Rutter, M., & Quinton, D. (1984). Parental psychiatric disorder: Effects on children. *Psychological Medicine*, *14*(4), 853–880.

Saleebey, D. (2002). *The strengths perspective in social work practice*. Allyn and Bacon. http://books.google.com/books?id=lTdHAAAAMAAJ

Schultz, D., Tharp-Taylor, S., Haviland, A., & Jaycox, L. (2009). The relationship between protective factors and outcomes for children investigated for maltreatment. *Child Abuse & Neglect*, *33*(10), 684–698. https://doi.org/10.1016/j.chiabu.2009.04.004

Stambaugh, L. F., Forman-Hoffman, V., Williams, J., Pemberton, M. R., Ringeisen, H., Hedden, S. L., & Bose, J. (2017). Prevalence of serious mental illness among parents in the United States: Results from the National Survey of Drug Use and Health, 2008–2014. *Annals of Epidemiology*, *27*(3), 222–224. https://doi.org/10.1016/j.annepidem.2016.12.005

Stith, S. M., Liu, T., Davies, L. C., Boykin, E. L., Alder, M. C., Harris, J. M., Som, A., McPherson, M., & Dees, J. (2009). Risk factors in child maltreatment: A meta-analytic review of the literature. *Aggression and Violent Behavior*, *14*(1), 13–29.

Sullivan, P. M., & Knutson, J. F. (2000). Maltreatment and disabilities: A population-based epidemiological study. *Child Abuse & Neglect*, *24*(10), 1257–1273. https://doi.org/10.1016/S0145-2134(00)00190-3

Szapocznik, J., & Williams, R. A. (2000). Brief Strategic Family Therapy: Twenty-Five Years of Interplay Among Theory, Research and Practice in Adolescent Behavior Problems and Drug Abuse. *Clinical Child and Family Psychology Review*, *3*(2), 117–134. https://doi.org/10.1023/A:1009512719808

Taylor, C. G., Norman, D. K., Murphy, J. M., Jellinek, M., Quinn, D., Poitrast, F. G., & Goshko, M. (1991). Diagnosed intellectual and emotional impairment among parents who seriously mistreat their children: Prevalence, type, and outcome in a court sample. *Child Abuse & Neglect*, *15*(4), 389–401. https://doi.org/10.1016/0145-2134(91)90023-7

Thompson, D. (2020, March 2). *Odd child welfare trajectories* [Personal communication].

Thompson, R., & Wiley, T. R. (2009). Predictors of Re-Referral to Child Protective Services: A Longitudinal Follow-Up of an Urban Cohort Maltreated as Infants. *Child Maltreatment*, *14*(1), 89–99. https://doi.org/10.1177/1077559508325317

U.S. Department of Health & Human Services, Children's Bureau, & Administration for Children and Families, Administration on Children, Youth and Families. (2019). *Child maltreatment 2017*. https://www.acf.hhs.gov/cb/research-data-technology/ statistics-research/child-maltreatment.

Van Loon, L. M. A., Van De Ven, M. O. M., Van Doesum, K. T. M., Hosman, C. M. H., & Witteman, C. L. M. (2015). Factors promoting mental health of adolescents who have a parent with mental illness: A longitudinal study. *Child & Youth Care Forum*, *44*(6), 777–799. https://doi.org/10.1007/s10566-015-9304-3

Van Loon, L. M. A., Van de Ven, M. O. M., Van Doesum, K. T. M., Witteman, C. L. M., & Hosman, C. M. H. (2014). The relation between parental mental illness and adolescent mental health: The role of family factors. *Journal of Child and Family Studies*, *23*(7), 1201–1214. https://doi.org/10.1007/s10826-013-9781-7

Vos, T., Barber, R. M., Bell, B., Bertozzi-Villa, A., Biryukov, S., Bolliger, I., Charlson, F., Davis, A., Degenhardt, L., Dicker, D., Duan, L., Erskine, H., Feigin, V. L., Ferrari, A. J., Fitzmaurice, C., Fleming, T., Graetz, N., Guinovart, C., Haagsma, J., … Murray, C. J. L. (2015). Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, *386*(9995), 743–800. https://doi.org/10.1016/S0140-6736(15)60692-4

Walsh, C., MacMillan, H. L., & Jamieson, E. (2003). The relationship between parental substance abuse and child maltreatment: Findings from the Ontario Health Supplement. *Child Abuse and Neglect*, *27*(12), 1409–1425.

Wan, M. W., Penketh, V., Salmon, M. P., & Abel, K. M. (2008). Content and style of speech from mothers with schizophrenia towards their infants. *Psychiatry Research*, *159*(1–2), 109–114. https://doi.org/10.1016/j.psychres.2007.05.012

Wang, Y., & Dix, T. (2015). Mothers' early depressive symptoms predict children's low social competence in first grade: Mediation by children's social cognition. *Journal of Child Psychology & Psychiatry*, *56*(2), 183–192. https://doi.org/10.1111/jcpp.12297

Werner, E. E. (1989). High-risk children in young adulthood: A longitudinal study from birth to 32 years. *American Journal of Orthopsychiatry*, *59*(1), 72–81. https://doi.org/10.1111/j.1939-0025.1989.tb01636.x

Werner, E. E., & Smith, R. S. (1982). *Vulnerable but invincible: A longitudinal study of resilient children and youth*. McGraw-Hill.

Westad, C., & McConnell, D. (2012). Child welfare involvement of mothers with mental health issues. *Community Mental Health Journal*, *48*(1), 29–37.

Windle, G. (2011). What is resilience? A review and concept analysis. *Reviews in Clinical Gerontology*, *21*(2), 152-169 18p. https://doi.org/10.1017/S0959259810000420

Wulczyn, F., Chen, L., & Hislop, K. B. (2007). *Foster care dynamics, 2000-2005: A report from the multistate foster care data archive*.

Wulczyn, F., & Lery, B. (2007). *Racial disparity in foster care admissions*.

Yan, N. (2016). Children's resilience in the presence of mothers' depressive symptoms: Examining regulatory processes related to active agency. *Children and Youth Services Review*, *61*, 90–100. https://doi.org/10.1016/j.childyouth.2015.12.008

Zuravin, S. J., & DePanfilis, D. (1997). Factors affecting foster care placement of children receiving child protective services. *Social Work Research*, *21*(1), 34–42. https://doi.org/10.1093/swr/21.1.34

Appendix

Table A1
Confounding effect of safety assessment timeliness on exposure-outcome association

	Uncontrolled		Controlled		% change
	OR	95% CI	*OR*	95% CI	in *OR*
Chapter 1					
Mental Health Problems Model					
MH	6.14***	(4.42, 8.54)	6.09***	(4.38, 8.47)	< 1
Timeliness			1.17	(0.85, 1.60)	
Intercept	0.05***	(0.04, 0.06)	0.05***	(0.04, 0.06)	
Chronic Mental Health Problems Model					
CMH	11.00***	(6.94, 17.43)	10.91***	(6.88, 17.29)	< 1
Timeliness			1.01	(0.71, 1.42)	
Intercept	0.05***	(0.04, 0.06)	0.05***	(0.04, 0.07)	
Mental Health Problems and Substance Abuse Model					
MHSA	19.14***	(13.76, 26.61)	19.19***	(13.79, 26.70)	< 1
Timeliness			0.95	(0.70, 1.28)	
Intercept	0.05***	(0.04, 0.06)	0.05***	(0.04, 0.07)	
Chapter 2					
Mental Health Problems Model					
MH	2.58***	(1.79, 3.71)	2.55***	(1.77, 3.67)	1
Timeliness			1.23	(0.87, 1.74)	
Intercept	0.24***	(0.21, 0.29)	0.21***	(0.16, 0.29)	
Substance Abuse Model					
SA	4.20***	(3.13, 5.62)	4.14***	(3.09, 5.54)	1
Timeliness			0.95	(0.70, 1.30)	
Intercept	0.24***	(0.21, 0.29)	0.25***	(0.19, 0.33)	

Mental Health Problems and Substance Abuse Model					
MHSA	5.32***	(3.73, 7.58)	5.35***	(3.75, 7.63)	< 1
Timeliness			0.99	(0.71, 1.38)	
Intercept	0.24***	(0.21, 0.29)	0.25***	(0.18, 0.33)	
Chapter 3					
Substantiations					
Mental Health Problems Model					
MH	3.97***	(3.06, 5.16)	3.93***	(3.03, 5.11)	1
Timeliness			1.02	(0.86, 1.21)	
Intercept	0.29***	(0.27, 0.32)	0.29***	(0.25, 0.34)	
Substance Abuse Model					
SA	8.56***	(6.77, 10.81)	8.55***	(6.76, 10.81)	< 1
Timeliness			1.06	(0.89, 1.26)	
Intercept	0.29***	(0.27, 0.32)	0.28***	(0.24, 0.33)	
Mental Health Problems and Substance Abuse Model					
MHSA	22.74***	(14.69, 35.20)	23.50***	(15.06, 36.66)	1
Timeliness			0.98	(0.82, 1.17)	
Intercept	0.29***	(0.27, 0.32)	0.30***	(0.26, 0.35)	
Case Openings					
Mental Health Problems Model					
MH	7.20***	(5.51, 9.41)	7.25***	(5.54, 9.48)	< 1
Timeliness			1.33*	(1.07, 1.66)	
Intercept	0.15***	(0.13, 0.17)	0.12***	(0.10, 0.15)	
Substance Abuse Model					
SA	10.86***	(8.64, 13.63)	10.88***	(8.65, 13.68)	< 1
Timeliness			1.35**	(1.09, 1.67)	
Intercept	0.15***	(0.13, 0.17)	0.12***	(0.10, 0.14)	

Mental Health Problems and Substance Abuse Model					
MHSA	26.62***	(18.30, 38.72)	27.77***	(19.00, 40.60)	1
Timeliness			1.29*	(1.03, 1.62)	
Intercept	0.15***	(0.13, 0.17)	0.12***	(0.10, 0.15)	
Family Maintenance					
Mental Health Problems Model					
MH	4.82***	(3.60, 6.45)	4.85***	(3.62, 6.50)	< 1
Timeliness			1.24†	(0.96, 1.61)	
Intercept	0.10***	(0.09, 0.11)	0.08***	(0.07, 0.10)	
Substance Abuse Model					
SA	3.61***	(2.79, 4.66)	3.64***	(2.82, 4.71)	1
Timeliness			1.23†	(0.96, 1.58)	
Intercept	0.10***	(0.09, 0.11)	0.08***	(0.07, 0.10)	
Mental Health Problems and Substance Abuse Model					
MHSA	3.24***	(2.26, 4.64)	3.29***	(2.30, 4.72)	2
Timeliness			1.19	(0.92, 1.55)	
Intercept	0.10***	(0.09, 0.11)	0.08***	(0.07, 0.11)	
Placement					
Mental Health Problems Model					
MH	6.25***	(4.51, 8.65)	6.20***	(4.48, 8.59)	< 1
Timeliness			1.22	(0.89, 1.67)	
Intercept	0.05***	(0.05, 0.06)	0.05***	(0.04, 0.06)	
Substance Abuse Model					
SA	11.89***	(9.20, 15.36)	11.72***	(9.06, 15.15)	1
Timeliness			1.26	(0.95, 1.68)	
Intercept	0.05***	(0.05, 0.06)	0.05***	(0.03, 0.06)	

Mental Health Problems and Substance Abuse Model					
MHSA	25.34***	(18.19, 35.31)	25.62***	(18.36, 35.75)	< 1
Timeliness			1.19	(0.87, 1.63)	
Intercept	0.05***	(0.05, 0.06)	0.05***	(0.04, 0.06)	
Re-Referral					
Mental Health Problems Model					
MH	1.17	(0.81, 1.68)	1.18	(0.81, 1.70)	5
Timeliness			1.00	(0.82, 1.22)	
Intercept	0.22***	(0.20, 0.24)	0.22***	(0.18, 0.25)	
Substance Abuse Model					
SA	1.71***	(1.27, 2.31)	1.72***	(1.28, 2.33)	1
Timeliness			0.95	(0.79, 1.16)	
Intercept	0.22***	(0.20, 0.24)	0.22***	(0.19, 0.26)	
Mental Health Problems and Substance Abuse Model					
MHSA	2.44***	(1.52, 3.92)	2.51***	(1.55, 4.04)	3
Timeliness			0.99	(0.81, 1.21)	
Intercept	0.22***	(0.20, 0.24)	0.22***	(0.18, 0.26)	

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse.

† $p \leq 0.10$

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

Table A2

Effect of cumulative protective factors on association between parental mental health problems/substance abuse and safety decision: Immediate versus 10-day referral response

	Households with ≥ 1 Safety Threat (n=1,420)		Households with 10-Day Response (n=516)		Households with Immediate Response (n=896)	
	OR	95% CI	OR	95% CI	OR	95% CI
Cumulative protective factors	0.54***	(0.48, 0.61)	0.63***	(0.52, 0.76)	0.50***	(0.42, 0.58)
Exposure						
MH	1.71†	(0.97, 3.01)	1.24	(0.40, 3.88)	1.78	(0.88, 3.60)
SA	3.53***	(2.14, 5.82)	2.24	(0.76, 6.56)	3.12***	(1.71, 5.67)
MHSA	3.34***	(1.90, 5.89)	4.93*	(1.27, 19.11)	2.73**	(1.41, 5.31)
Exposure-protective factor interaction						
MH	1.08	(0.83, 1.41)	1.33	(0.89, 1.99)	1.03	(0.74, 1.44)
SA	0.96	(0.77, 1.18)	1.03	(0.69, 1.55)	0.99	(0.77, 1.28)
MHSA	1.08	(0.85, 1.37)	0.63	(0.28, 1.38)	1.24	(0.95, 1.63)
Assessment year	0.95†	(0.89, 1.00)	0.93	(0.82, 1.05)	0.91**	(0.85, 0.97)
Child referral history	0.58*	(0.37, 0.92)	0.44†	(0.17, 1.11)	0.66	(0.37, 1.16)
Child ages 0-5	0.64**	(0.46, 0.88)	0.50*	(0.28, 0.90)	0.48***	(0.31, 0.74)
Race						
White	1.08	(0.72, 1.63)	1.38	(0.60, 3.18)	0.98	(0.60, 1.59)
Hispanic	0.83	(0.59, 1.18)	0.77	(0.38, 1.52)	1.04	(0.67, 1.60)
Asian	0.76	(0.48, 1.20)	0.68	(0.27, 1.70)	0.79	(0.45, 1.40)
Mixed	1.86	(0.63, 5.48)	0.00	(0.00, 0.00)	1.96	(0.56, 6.82)
Intercept	2.01**	(1.28, 3.15)	0.92	(0.41, 2.09)	4.52***	(2.46, 8.32)

Notes. MH=Current mental health problems only; SA=Current substance abuse only; MHSA=Current mental health problems and substance abuse; reference group for each exposure is no mental health problems or substance abuse; reference group for race dummy variables is Black.

† $p \leq 0.10$

* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$