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Income instability and child maltreatment: Exploring associations and mechanisms

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ABSTRACT

Income instability is an aspect of having a low-income that likely has unique implications for child maltreatment. The unpredictable nature of frequent changes in economic resources may add additional stress and strain to families already experiencing significant financial stress, which could increase risk for abuse and neglect. Work has begun to examine the relationship between income instability and child and family outcomes, but limited work has focused on the association between frequent income instability and child maltreatment. The current study begins to address this gap in the literature by examining the association of income instability and child maltreatment in a sample of low-income families deflected from Child Protective Services. Mediation analyses are conducted to investigate potential mechanisms of this association (e.g., stress, parenting, maladaptive behaviors). Findings indicate income instability significantly increases risk for child maltreatment, beyond the influence of income level. Substance abuse partially mediates this relationship. Implications of findings are discussed.

1. Introduction

Low-income families are at a disproportionately high risk of child maltreatment, and living in poverty is associated with poor parenting and child outcomes (Engle & Black, 2008; Kim & Drake, 2018; Slack, Holl, McDaniel, Yoo, & Bolger, 2004). Beyond a static low-income level, however, it is likely that experiencing income instability adds to the stress and hardship of a household. For the purpose of this study, income instability refers to changes in the sources of income for a household, including earnings and social welfare benefits. Previous work has identified that income instability has risen in recent decades (Dynan, Elmendor, & Sichel, 2012), and income instability is more common amongst low-income families (Gennetian, Wolf, Hill, & Morris, 2015). Thus, when studying income and child maltreatment, it is important to consider income instability as a unique aspect of having a low-income that may have distinct relationships with families' outcomes. Work has begun to unpack the socioemotional effects of income instability, and there is initial evidence to suggest it adds to levels of stress and decreases well-being. Indeed, a recent study tracking families' daily financial patterns found that 77% of participants chose "financial stability" as preferable to "moving up the income ladder" (Morduch & Schneider, n.d.). This demonstrates how prevalent and troublesome income instability can be for low-income families and points to its importance if we want to understand how low-incomes and poverty may be impacting child maltreatment and parenting behaviors. The current study aims to measure the relation of income instability with child maltreatment using a sample of Wisconsin families at-risk for CPS involvement. Additionally, this study examines the mechanisms through which instability may have an influence on child maltreatment by studying the mediating effects of socioemotional and behavioral factors, including stress, parenting, and maladaptive behaviors.

2. Background

2.1. Considering the role of income instability

Previous literature has established a clear link between socioeconomic disadvantage and increased risk of child maltreatment (Slack et al., 2003, 2004; Trickett, Aber, Carlson, & Cicchetti, 1991). Other aspects of a low socioeconomic status, such as unemployment and welfare receipt, have also been associated with child maltreatment risk (Brown & De Cao, 2017; Slack et al., 2003). Studies of the mechanisms of these relationships suggest stress and hardship associated with fewer economic resources may contribute to harsh and neglectful parenting (Shanahan, Runyan, Martin, & Kotch, 2017). Moreover, child neglect is the most common type of child maltreatment, and neglect is more likely to occur for reasons of poverty (Hussey, Chang, & Kotch, 2006; Sedlak, Mettenburg, Basena, Petta, McPherson, Greene, & Li, 2010). Thus, the

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likelihood of families becoming involved with the child welfare system increases greatly when dealing with scarce economic resources. Given the strongly supported relationship of income with child maltreatment, it is important to also examine the potential association of income instability with maltreatment.

Income instability is more common within low-income families, and there is preliminary evidence to suggest it contributes to the stress in a household and poor outcomes for youth. For example, studies examining trends in individual and household income volatility conclude that income instability in the United States has grown in the past thirty years (Dynan et al., 2012; Shin & Solon, 2011). One estimate found a doubling of income instability from 1980 to 2009 (Hardy & Ziliak, 2014), and another study identified a 30% increase in volatility since the 1970s (Dynan et al., 2012). Previous work also shows rates of income instability to be consistently higher amongst low-income families than their higher-income counterparts (DeNavas-Walt, Proctor, & Smith, 2009; Gennetian & Shafir, 2015; Gennetian et al., 2015). This disproportionality in income instability remains present even after accounting for other important risk factors, like race and ethnicity (Gennetian, Rodriques, Hill, & Morris, 2018). Taken together, the evidence is clear that income instability has increased over time in the United States, and that low-income families are more likely to experience this instability. Given that low-income families are overrepresented in the child welfare system, it is important to investigate any potential associations of income instability with child maltreatment that are distinct from the effects of a low income level.

2.2. Experiencing income instability

Many studies have looked at trends in income instability and how it relates to things like labor force changes and macroeconomic trends (Gottschalk, Moffitt, Katz, & Dickens, 1994; Hardy, 2017; Jorda, Schularick, & Taylor, 2011), but fewer studies have looked at instability in relation to familial, adult, and child outcomes of the families experiencing this instability. Dealing with unpredictable economic resources (e.g., frequent income shocks and dips) likely has deleterious effects on families. And, while there is a breadth of research showing the negative effects of poverty on children and families (Cancian & Danziger, 2009; Gennetian, Castells, & Morris, 2010; Wagmiller, Lennon, Kuang, Alberti, & Aber, 2006), less is known about the unique impacts of income instability. Family processes may change due to economic instability (e.g., parent work schedules, housing changes; Fredericks, Blumenfeld, & Paris, 2004), and the parental stress that arises when dealing with unpredictable economic resources may interrupt household routines and impede positive parenting practicies (e.g., increased stress, impatience; Hill, Morris, Gennetian, Wolf, & Tubbs, 2013).

Work has begun to examine the socioemotional effects of income instability, and initial evidence suggests it does add to levels of stress and decrease well-being (Gennetian et al., 2015; Morduch & Schneider, 2017). In terms of linking instability to child outcomes, Gennetian et al. (2015) found income instability to be negatively associated with school engagement in adolescents and positively associated with suspensions and expulsions. This finding held after controlling for demographic characteristics and income level—suggesting a unique impact of income instability. Experiencing income volatility as a child is also negatively associated with educational achievement, and this relationship is largest for young adults who grew up in moderate-income households (Hardy, 2014). Large amounts of income and job instability in a household are associated with worse health outcomes for children, and more recent instability appears to have the strongest negative influence (Wolf & Morrissey, 2017). In short, while additional empirical work is needed to fully understand the effects of income instability beyond static income level, initial work in this area suggests that income instability has unique, adverse effects on children.

Limited research has directly examined the relationship between patterns of income instability and parenting behaviors. One study examined income instability as a facet of a family's economic circumstances and linked income instability to greater maternal depressive affect, which was, in turn, associated with punitive parenting behaviors (Yeung, Linver, & Brooks-Gunn, 2002). However, an important limitation of this study is that income instability was measured with yearly counts of income, which does not attend to income volatility that may occur within the year. Another recent study examining the impact of the Great Recession on parenting and child maltreatment behaviors found the large, systemic shock to the nation's economic system had a direct, positive effect on rates of child abuse and neglect and a negative effect on maternal affect (Schneider, Waldfogel, & Brooks-Gunn, 2017). Other forms of instability, such as relationship changes, job loss, and shocks to disposable income due to changes in consumer costs are adversely related to parenting stress (Beck, Cooper, McLanahan, & Brooks-Gunn, 2010; Nomaguchi & Johnson, 2016), mental health (Osborne, Berger, & Magnuson, 2012), and rates of child maltreatment referrals (McLaughlin, 2017). Thus, it is likely that income instability adds unique stress to all members of a household, and these socioemotional impacts of income instability are one way in which income instability may increase risk of child maltreatment.

2.3. Parsing apart income instability

Income instability has been measured and defined in numerous ways. Some studies have focused on trends of instability in annual earnings, as well as instability in hourly wage amounts and hours worked (Congressional Budget Office, 2008; Gottschalk et al., 1994). Instability in benefit receipt (e.g., losing and gaining welfare benefits) has also been studied as an important economic experience (Newman, 2006). Finally, a combination of all earnings and benefits available to a household has been measured to assess the total household income instability (Ziliak, Hardy, & Bollinger, 2011). For the present study, I am interested in the relationship of total income instability, including both earnings and welfare transfers, with child maltreatment. Given that many of the families in the child welfare system are low-income, it is likely they rely on welfare benefits for a significant portion of their income. As such, neglecting to measure welfare benefits as a source of income would likely underestimate the economic resources available to these families. Moreover, measuring instability of total income as a combination of earnings and benefits allows for discerning between sources of instability.

Earnings instability likely has unique implications for child maltreatment. Working low-wage or seasonal jobs is more common amongst low-income families, and these jobs are more likely to lead to income instability due to predictable or unpredictable periods of unemployment and/or hours (Mills & Amick, 2010). Brown and De Cao (2017) found unemployment rates led to increases in neglect in the United States, and Berger et al. (2011) showed an increased risk of physical abuse during the economic recession, which was a time marked with increased unemployment. Thus, instability in earnings from major changes like job loss or work hour reductions may have an influence on child maltreatment. Considering this, it is important to examine the association of earnings instability separately from total income and benefit instability.

Benefit instability may also have a distinct influence on child maltreatment. Families in the child welfare system are likely to use welfare benefits and be involved with various social service systems (Fein & Lee, 2003; Paxson & Waldfogel, 2003). Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance to Needy Families (TANF), Medicaid, and childcare subsidies are important components of our social welfare safety net. However, SNAP, TANF, and childcare subsidies are means-tested programs that result in reductions in benefit amount as income rises. In addition, TANF is designed with a work or training-to-work eligibility criteria, and TANF can only be accessed for up to five years. This policy design reflects the tendency of social

welfare policies to reward the "deserving poor," or working individuals, resulting in a lack of support to particularly vulnerable families (Tach & Edin, 2017). Indeed, individuals working low-wage jobs may be more susceptible to periods of unemployment, which would increase their risk of losing valuable welfare benefits.

Previous work studying patterns of benefit receipt found TANF to be the least responsive to economic downturns (Bitler & Hoynes, 2016), and around one-fifth of low-income families experienced three or more changes in SNAP eligibility within one year (Newman, 2006). Notably, Moffitt and Ribar (2008) found families with greater income volatility experience more fluctuation in SNAP participation than their permanently low-income peers. Thus, benefit instability is likely a reality of low-income families – particularly families with significant income instability – and its association with child maltreatment should be examined separately from earnings instability.

The current study focuses on income supports in the form of cash and near-cash benefits. SNAP and TANF represent such transfers to a family, although SNAP is restricted to food-related purchases. Childcare subsidies and Medicaid, however, are used to offset medical and childcare costs, and do not directly function as supplemental disposable income. As such, benefit instability is measured through fluctuations in the combined benefit amount of SNAP and TANF. This study examines the relationship of income instability with child maltreatment by measuring total income instability, earnings instability, and combined SNAP and TANF benefit instability as separate predictors of child maltreatment. Mediation models are also tested to examine the potential indirect effect of socioemotional and behavioral factors on child maltreatment through instability.

3. Theory

Theoretical explanations specific to the effects of income instability on behaviors and outcomes are limited, but key theories within the poverty and family literature offer insight into how instability and child maltreatment may be related and what mechanisms might explain some of that relationship.

Family Chaos Model. Evidence for the negative impacts of family chaos and stress has developed in the psychology and family sociology fields (Evans & Wachs, 2010). Chaotic environments can make it extremely difficult to establish daily, meaningful routines that fit within a household's abilities and resources. In the presence of chaotic environments and lack of consistent routines, families are often unable to find meaningful engagement with their activities and their communities. This can lead to decreased well-being and elevated stress and conflict in a home (Evans & Wachs, 2010). Greater chaos in a home has been associated with less responsiveness and efficacy within parents, in addition to reduced parental competency and a reduced ability to self-regulate in children (Coldwell, Pike, & Dunn, 2006; Corapci & Wachs, 2002). Family chaos is often a result of experiences like relationship instability, evictions, unemployment, or other types of transitions due to changing familial and economic circumstances (Grandner et al., 2010; Rhoades, Kamp Dush, Atkins, Stanley, & Markman, 2011). As such, income instability is another factor that could lead to greater chaos within a household, which could add stress and strain to parent-child relationships and routines, consequently increasing risk for child maltreatment. Thus, changes in parenting behaviors (e.g., affection, routines, impatience) in the wake of frequent instability may elevate that family's risk of maltreatment.

Stress Theory. The Family Stress Model (FSM) illuminates the potential impacts of economic stress on a household. Economic resources likely affect parents and children through the pressure generated when money is scarce or negative financial events occur, such as a job loss or large medical expense. This new pressure and added stress, according to the FSM (Conger & Conger, 2002; Conger et al., 2002), gives psychological meaning to experiences of economic hardship. These significant experiences of stress can lead to emotional and behavioral problems within a family, which can contribute to hostility and conflict that may eventually lead to maltreatment. The theoretical model suggests that economic hardships disrupt functioning of a family by increasing psychological distress of parents, interfering with the parenting of the adults in the home, and contributing to the maladjustment of children (Conger, Conger, & Martin, 2010). These consequences can be exacerbated or dampened by risk and protective factors within the home (Masarik & Conger, 2017).

Studies testing this theory find that economic hardship is indeed associated with added economic pressure that contributes to emotional distress for adult couples (Conger et al., 2002; Parke et al., 2004). With regard to child maltreatment, recent work has found that the stress induced by negative economic events is linked to an increased risk for child abuse in the preschool years (Warren & Font, 2015).

Taken together, the evidence seems clear on the ability of negative economic events and pressure to influence the stress and parenting of families. As such, income instability may have unique associations with child maltreatment beyond the effects of static income level by adding to the stress of families already dealing with significant strain due to scarce economic resources. Consequently, we might expect that families experiencing frequent income instability will also report more parenting stress and financial stress. This theory also leads to a hypothesis that frequent income volatility would reduce parenting quality and increase hostile behavior as a response to increased economic pressure. As such, understanding the roles of maladaptive parenting behaviors – particularly behaviors reflective of maltreatment and stress – as potential mechanisms is important for gaining a more complete picture of how income instability may increase a family's risk for maltreatment.

Other stressors – both familial and economic – can result in maladaptive adult behaviors that are not specific to parenting but would negatively impact children and families in a variety of ways, including parental functioning. Elevated stress has been linked to increased substance use and illegal behaviors (e.g., theft, battery; Boardman, Finch, Ellison, Williams, & Jackson, 2001; Eitle & Turner, 2003; Lindenberg, Gendrop, & Reiskin, 1993). Unemployment is robustly associated with increased substance use (Compton, Gfroerer, Conway, & Finger, 2014), and job instability is associated with increased drug use (Bentler, 1992). Indeed, when parents recognize the stressors in their lives and the inability to meet their personal and familial needs, responses are often maladaptive (Kelley, 1998; Neger & Prinz, 2015). Substance use increases risk for maltreatment and CPS involvement (Hafekost et al., 2017; Suchman, Decoste, Leigh, & Borelli, 2010), so its potential mediating role in the relationship of income instability and child maltreatment should be tested. Additionally, economic stress and an inability to meet economic needs through legal means could lead to illegal behaviors (Ehrlich, 1973; Entorf, 2009), and the perceived rewards of illegal activities may seem particularly high in times of stress due to income instability. More generally, given that parental incarceration is associated with CPS involvement (Berger, Cancian, Cuesta, & Noyes, 2016), illegal behaviors are an important consideration as potential mediators of the association between income instability and child maltreatment.

In sum, these theories suggest that frequent income instability would likely increase the risk of child maltreatment, and they offer guidance on potential mechanisms of this relationship (stress, poor parenting, maladaptive behaviors). However, these relations have yet to be fully investigated. The current study hopes to address this gap in the literature using linked survey and administrative data for the following aims:

(1) Examine the association of total income instability, earnings instability, and benefit instability with child maltreatment; and
(2) Test direct, indirect, and total effects pathways for factors hypothesized to act as mechanisms of relations of income, earnings, and benefit instability with child maltreatment.

4. Methods

Sample and data. The data for this study comes from Project GAIN, a randomized control trial (RCT) conducted in Milwaukee County, Wisconsin for families at-risk of CPS involvement. In the RCT, families were randomized to the study if they had an investigation opened to CPS, but the case was not moved to ongoing services because maltreatment was not substantiated. These are families likely in need of services, but not meeting the legal threshold for maltreatment, and such deflected families are highly likely to have a repeat CPS investigation and future substantiated case (Putnam-Hornstein, Simon, Eastman, & Magruder, 2015; Waldfogel, 2009). Thus, the sample in this study is at-risk for future CPS involvement.

A cohort of the Project GAIN sample participated in an in-depth baseline and follow-up survey (N = 727). The baseline survey was conducted after individuals had been randomized to the treatment or control group (from February 3, 2016 to December 31, 2016), and the follow-up survey was conducted a year after the baseline. The survey asked questions about a variety of factors and behaviors (e.g., financial hardship, relationship quality, parenting behaviors, support networks). These data are linked to the administrative earnings and benefit data from the Wisconsin Data Core harmonized administrative data system housed at the Institute for Research on Poverty at the University of Wisconsin-Madison. This allows us to link individuals in Wisconsin across the child welfare system, social welfare benefits, and earnings. The administrative data is unique in its ability to give accurate reports of income and child maltreatment that do not rely on self-report and include the entire population of individuals and families involved in the included programs. In this way, linking the administrative data and survey sample provides a unique chance to connect interpersonal behaviors and attitudes with administrative income and child maltreatment data. Multiple imputation is used in the survey sample to address missing data on various survey measures. Missing data is due to non-response on scales and missing information on the self-report of household income. Appendix A shows descriptive statistics of the sample before and after imputation. A baseline survey weight is used in analyses for sample selection bias such that, once weighted, the survey is representative of the underlying population. Lastly, three participants were randomized to Project GAIN two separate times, so they are excluded from the analysis.

4.1. Administrative data measures

Income instability. In previous work, income instability is quantified in numerous ways. Many researchers use annually or bi-annually collected data (e.g., PSID, CPS) to measure trends over time in income volatility, with changes to income level being measured on a yearly (or bi-yearly) basis. However, family chaos theory leads us to believe that more frequent experiences of instability will have greater implications for the stress and well-being of a family, so considering multiple, more proximal time points of income to gauge a family's income instability is necessary to further our understanding of the association between instability and maltreatment. Previous work using the Survey of Income and Program Participation (SIPP) addresses this gap by using data that measures income every four months (Gennetian et al., 2015; Morris, Hill, Gennetian, Rodrigues, & Wolf, 2015). Similar to the SIPP, the current data allow me to measure earnings and benefit amounts every three months. By utilizing multiple time points of income within a year, we can gain a better picture of frequent changes in income rather than changes in income a year apart. Thus, income instability is measured using quarterly earnings and benefit data from the year before completion of the baseline survey. The administrative measures are limited because they only measure the individuals' earned income. Thus, other adult earners in the household are not accounted for in my measures of instability. This limitation will be discussed.

To measure income instability, the coefficient of variation (CV) is used, or the ratio of the standard deviation to the mean. Income was parsed into two components: earnings and benefits. Earnings data was used to create the CV for earnings, and the combined, quarterly benefit amounts for SNAP and TANF were used to calculate a benefit CV. Earnings and benefit amounts were also combined to create quarterly measures of total income, and a CV was created using these amounts. As such, three CV measures were created in the administrative data: CV for total income (earnings + benefits), CV for earnings only, and CV for benefits only. All of these CVs were calculated for the year prior to baseline survey completion. All monetary amounts were adjusted for inflation to 2017 dollars. The CV is useful in its ability to measure a continuous range of instabilities, rather than dichotomous drops or raises, but it is unable to discern the direction of instability (e.g., increases or decreases in income). Regardless of this limitation, it is a common and effective strategy for measuring income instability (Morduch & Siwicki, 2017; Morris et al., 2015).

A significant portion of the sample reported zero earnings or were missing earnings information in the administrative data. Participants may be missing from this file because they were not working or because they were earning income at a job not eligible for unemployment insurance. Dummy variables were created for each quarter of earnings to indicate if the individual was missing earnings data during that quarter. Then, individuals missing earnings data were re-coded to have zero earnings in that quarter. All dummy variables for missing earnings data are included in regression analyses. Moreover, some participants reported average earnings of zero dollars in a year, as well as a standard deviation of zero. When calculating a ratio of the standard deviation to the mean, a mean of zero is problematic because it is not possible to divide by zero. Thus, individuals with mean earnings of zero in a year were recoded to 1, which gave these individuals a CV of zero.

Child maltreatment. Using the administrative data, involvement with CPS in the time between baseline and Wave 2 survey collection (approximately 12-months later) is measured in two ways: any CPS referral and any CPS referral with the primary caregiver identified as the alleged maltreater. The distinction is made between these two categories because the primary caregiver is likely to be heavily affected by income instability in the household (as measured with the CV), while an alleged maltreater outside of the home (e.g., daycare provider, relative) is likely to be less affected. These are not mutually exclusive categories, so a family that has a caregiver referral would also be included in the broader category of any referral. Additionally, administrative data is used to identify the type of abuse that occurred. The different categories of maltreatment are neglect, physical abuse, emotional abuse, and sexual abuse. These categories are differentiated using worker codes for allegation type on each case. Individual cases could have more than one allegation type, so these categories are also not mutually exclusive. An allegation of *emotional damage* was considered emotional abuse. Physical abuse has its own indicator of allegation type. Allegations of *failure to thrive, lacking supervision, medical neglect, neglect, other medical neglect,* and *abandonment* are all considered neglect. And allegations of *sexual abuse, sexual contact/intercourse, prostitution, sexual exploitation, mutual sexual activity,* and *forced viewing of sexual activity* are considered sexual abuse. Allegations of *unborn child abuse* and *manufacturing methamphetamine* are considered allegations of substance use. It is important to note that in Wisconsin, unborn child abuse allegations are unable to be substantiated and reserved for cases of maternal substance misuse.

Because economic resources are more often predictors of neglect allegations, this analysis focuses on identifying differences in the associations of instability and child maltreatment for neglect versus abuse cases. Thus, two separate indicator categories were created: neglect only and other abuse (encompassing physical, sexual, emotional abuse, and substance use). Neglect only reflects cases where the only maltreatment allegation identified was neglect. Some cases have more than one allegation type assigned, and cases with a neglect allegation in addition to an allegation of physical or sexual abuse, for example, are

counted in the *other abuse* group. The number of cases with neglect and other abuse allegations was small (N = 12).

It is important to note that the indicators of CPS involvement measured in this study are taken from the CPS referral and do not always result in a substantiated finding of abuse or neglect. However, by measuring CPS involvement as a proxy for child maltreatment, the current study is able to capture a wide range of families both demonstrating maltreatment behaviors and at-risk for demonstrating maltreatment behaviors. Additionally, identifying the type of maltreatment attached to each referral is indicative of the types of concerns and issues in a particular family. Thus, while CPS involvement and substantiated abuse and neglect are not the same, there is a significant amount of overlap that allows CPS involvement to act as a useful proxy for child maltreatment.

4.2. Mediating variables

Theoretical considerations and prior literature guide the selection of mediator variables into four distinct groups: normative parenting behaviors, maltreatment behaviors, stress, and maladaptive behaviors. Cronbach's alpha (α) are reported for each scale as a measure of internal reliability.

4.2.1. Normative parenting behaviors

The following measures of parenting beliefs were developed specifically for the GAIN study.

Attention (α = 0.59) is measured with three items, and items are reverse coded when necessary so higher scores indicate greater attention given to children. Participants indicated their level of agreement (*1* = strongly disagree, *5* = strongly agree) with the following items: "You spend a lot of time talking or playing with your children," "You often lack the time and energy to pay close attention," and "You are comfortable with the amount of supervision you give to your children."

Affection (α = 0.48) is measured with four items, and items are reverse coded when necessary so higher scores indicate greater affection and warmth given to children. Participants indicated their level of agreement (*1* = strongly disagree, *5* = strongly agree) with the following items: "Too much affection will spoil a child," "Even teenagers need to be told that they are loved," It's very important for a parent to smile a lot at their infants," and "The more you comfort a crying newborn, the more spoiled the baby will become."

Impatience (α = 0.70) is measured with two items, and higher scores indicate more impatience. Participants indicated their level of agreement (*1* = strongly disagree, *5* = strongly agree) with the following items: "You wish you did not become impatient so quickly with your children," and "You are bothered by the amount of yelling you direct toward your children."

Routines (α = 0.52) is measured with three items, and higher scores indicate greater adherence to routines. Participants indicated their level of agreement (*1* = strongly disagree, *5* = strongly agree) with items, including "Daily routines help young kids to feel safe and secure," and "It is important to put young children to bed at about the same time every night."

The normative parenting behaviors do not refer to a specific time frame.

4.2.2. Child maltreatment behaviors

These behaviors are measured with the Parent-Child Conflict Tactics Scales (PC-CTS; Straus & Gelles, 1990). The PC-CTS includes four subscales, but the GAIN study used items from three subscales.

Psychological aggression (α = 0.60) is measured with two questions, and higher scores indicate greater psychological aggression. Participants indicate the frequency (*1* = never, *5* = very often) of behavior in response to the following questions: "In the past 12 months, how often have you sworn at your child/children," and "In the past 12 months, how often have you called your child/children stupid, dumb, or other names?"

Physical assault (α = 0.50) is measured with two questions, and higher scores indicate more abusive behaviors. Participants indicate the frequency (*1* = never, *5* = very often) of behavior in response to the following questions "In the past 12 months, how often have you hit your child/children with an object," and "In the past 12 months how often have you spanked or slapped your child/children?"

Neglect behaviors (α = 0.64) are measured using 6 items, and higher scores indicate greater neglect. Participants indicate the frequency (*1* = never, *5* = very often) of behavior in response to questions like, "In the past 12 months, how often have you had to leave your child/children home alone," and "In the past 12 months, how often were you caught up with your own problems that you were not able to care for your child the way you would have liked to."

Stress

Parental distress (α = 0.80) is measured with the 12-item Role Strain subcale from the Parenting Stress Index (PSI-SF; Abidin, 1995). Six questions ask the degree of agreement with each statement (*1* = strongly disagree, *5* = strongly agree), and six ask how often certain circumstances occur (*1* = never, *5* = very often). Items are reverse coded, so a higher score indicates greater distress. Sample items include, "You feel trapped by your responsibilities as a parent," and "You have the feeling that you cannot handle things very well."

Economic stress (α = 0.84) is a seven-item scale. Items are reverse coded, so higher scores indicate greater economic stress. Participants indicate their level of agreement (*1* = strongly disagree, *5* = strongly agree) with statements like, "You feel stressed about your financial situation."

4.2.3. Maladaptive behaviors

Substance use (α = 0.82) is measured with the CAGE-AID, a common screener for substance use that accommodates both alcohol and drug use (Brown & Rounds, 1995). It is a five-item scale, and higher scores indicate more substance use. Respondents answer yes (1) or no (0) to items like, "Have you neglected some of your usual responsibilities because of alcohol and drugs," "Have you ever felt you should cut down on your alcohol or drug use," and "Have you ever felt bad or guilty about your alcohol or drug use."

Illegal activity (α = 0.38). Illegal activity is measured with three items, and higher scores indicate more illegal actions. Participants indicate the frequency (*0* = never, *4* = very often) of behavior in response to questions like, "How often have you sold food stamps or SNAP benefits or traded them for something else." This measure of illegal activities only measures minor offenses, but these behaviors could have implications for an increased risk of coming in contact with the child welfare system if they result in legal repercussions. Both measures of maladaptive behaviors ask about behaviors in the prior twelve months.

All mediation variables that included multiple items are averaged. Thus, the range of each measure is the minimum and maximum value of the response categories. Additionally, it is important to note the limitations of self-reported survey measures, particularly in light of the participants' recent involvement with CPS. Respondents may be hesitant to accurately report parenting and behaviors if they are concerned about potential mandated reporters or future CPS involvement. In anticipation of these measurement issues, the survey collection of Project GAIN included consent forms informing participants of the confidentiality of their responses, and respondents answered sensitive questions with Audio-CASI. This is a data collection method that is often well-received by survey respondents and has been successful in eliciting greater honesty from participants, particularly in response to sensitive questions (Kinsey, Thornberry, Carson, & Duffer, 1995; O'Reily, Hubbard, Lessler, Beimer, & Turner, 1994).

Table 1
Descriptive characteristics.

CPS Involvement	%
Referral within year	22.8
Referral within six months	12.8
Caregiver referral within year	19.1
Caregiver referral within six months	10.3
Neglect only allegation within year	15.3
Neglect only allegation within six months	8.0
Other abuse allegation within year	7.6
Other abuse allegation within six months	5.6

Covariates	Referral	No referral	Neglect allegation	Other abuse allegation
Treatment	51.2	50.6	52.3	49.1
Any IA in past 3 years	30.7	16.9[1]	27.0	38.2
Any substantiation in past 3 years	2.4	3.0	2.7	1.8
Income < 5k	18.3	14.3[1]	21.4	12.7
5k < = Income < 15 k	30.2	24.3[1]	29.4	32.0
15k < = Income < 30k	30.7	28.5[1]	31.3	28.5
30k < = Income < 50k	13.3	16.4	11.5	17.3
50k < = Income	7.5	16.5[1]	6.4	9.5
Married	11.4	18.4[1]	9.9	14.5
Cohabiting	20.5	20.5	22.5	16.4
Single	68.1	61.1[1]	67.6	69.1
Female	97.0	92.7[1]	97.3	96.4
Hispanic	13.3	14.6	13.5	12.7
White	28.9	25.3[1]	29.7	27.3
Black	62.7	58.6	60.4	67.3
Other	14.5	16.4	13.5	16.4
Less than high school	25.9	23.4	28.8	20.0
High school	36.7	31.4	35.1	40.0
More than high school	37.0	45.1	36.1	40.0
Respondent Age	33.7	36.0[1]	32.8	35.4
	(0.68)	(0.42)	(0.76)	(1.35)
Born in United States	93.4	93.4	94.6	90.9
Number of kids in household	2.9	2.4[1]	2.9	2.9
	(0.12)	(0.06)	(0.15)	(0.20)
Stress				
Parental distress (1–5)	2.29	2.22	2.34	2.21
	(0.05)	(0.03)	(0.06)	(0.08)
Economic stress (1–5)	2.61	2.43[1]	2.56	2.72
	(0.06)	(0.03)	(0.07)	(0.10)
Parenting				
Attention (1–5)	2.99	2.94	2.99	2.99
	(0.03)	(0.02)	(0.04)	(0.05)
Affection (1–5)	4.13	4.15	4.12	4.16
	(0.05)	(0.03)	(0.06)	(0.07)
Impatience (1–5)	2.46	2.51	2.43	2.51
	(0.08)	(0.04)	(0.10)	(0.15)
Routines (1–5)	3.43	3.38	3.44	3.41
	(0.03)	(0.02)	(0.04)	(0.05)
Maltreatment behaviors				
Psychological aggression (1–5)	1.62	1.55	1.54	1.77
	(0.06)	(0.03)	(0.07)	(0.11)
Physical assault (1–5)	1.27	1.30	1.20	1.42[2]
	(0.04)	(0.02)	(0.03)	(0.08)
Neglect (1–5)	1.46	1.40	1.44	1.48
	(0.04)	(0.02)	(0.05)	(0.07)
Maladaptive behaviors				
Substance use (0–1)	0.12	0.07[1]	0.15	0.06[2]
	(0.02)	(0.01)	(0.03)	(0.03)
Illegal (0–4)	0.31	0.20	0.37	0.20
	(0.07)	(0.03)	(0.10)	(0.09)
Economic variables				
Total income CV	0.42	0.35[1]	0.42	0.43
	(0.03)	(0.02)	(0.04)	(0.05)
Earnings CV	0.55	0.47	0.52	0.61
	(0.05)	(0.02)	(0.06)	(0.08)
Benefit CV	0.44	0.42	0.45	0.41
	(0.04)	(0.02)	(0.05)	(0.06)
Average quarterly income ($)	2910	4150[1]	2864	3003
	(187.2)	(165.9)	(235.1)	(309.6)
Average quarterly earnings ($)	1685	3206[1]	1609	1840
	(191.2)	(177.0)	(240.6)	(314.0)
Average benefits ($)	1237	962[1]	1272	1166
	(73.7)	(37.9)	(92.4)	(121.8)
N	166	561	111	55

Standard errors in parentheses.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
IA = Initial Assessment, the term used in WI for the initial contact with families that results in a case disposition.
Total income is the combination of income from earnings, SNAP, and TANF.
Race and ethnicity are not mutually exclusive. Respondents could select multiple racial identities if appropriate, and ethnicity was identified in a separate question.
All scales are coded so that higher scores indicate more of that construct.
[1] Significant mean difference between referral and no referral.
[2] Significant mean difference between neglect only and other abuse.

4.3. Survey controls

The survey questionnaire offers various measures to include as covariates in the analyses. Self-reported household income at baseline is included in the models, split into dichotomous indicators of income falling into certain ranges (< 5000; < 15,000; < 30,000; < 50,000; > 50,000 as the reference category). This measure is used, rather than the administrative measure, which is used to construct the CVs, because it includes informal income, income from employment not subject to Unemployment Insurance contributions, and income from other adults in the household. Covariates included in the model are relationship status of reference adult (married, cohabiting, single, with single as the reference category), sex, age of the reference adult, race (black, other, with white as the reference category), ethnicity (Hispanic), nativity to the United States, educational attainment (less than high school, high school, with more than high school as the reference category), and number of kids in the household. Additionally, because this sample was involved in a Randomized-Control Trial (RCT), the treatment status of individuals is included as a control in all models. Descriptive statistics for each of the variables can be found in Table 1, separated by type of CPS involvement and maltreatment allegation.

4.4. Analysis

Logistic regression models are estimated to examine the association between income instability and child maltreatment. Results are displayed in the form of odds ratios (OR), which can be interpreted as the increased odds of the outcome given a one-unit increase in the independent variable of interest. Table 3 uses the total income CV of the year prior to baseline survey to predict CPS investigation. Table 4

Table 2
Description of coefficient of variation.

Income Construct	Without benefits	With benefits	% change
Total income CV	0.49	0.37	−25.7***
	(0.02)	(0.01)	
Average income ($)	2859	3867	35.3***
	(145)	(136)	
Average SD of income ($)	946	1015	7.3***
	(42)	(38)	

N = 727.
*** denotes a significant difference in mean values with and without benefits at a $p < 0.001$ level.
Standard errors in parentheses.
SD = standard deviation.
Total income is the combination of income from earnings, SNAP, and TANF.
"Without benefits" is the value when only earned income is measured.
"With benefits" is the value after adding SNAP and TANF amounts to earned income.

Table 3
Logistic regression results of CPS involvement regressed on total income instability.

Independent Variables	Referral within 1 year	Referral within 6 months	Caregiver referral within 1 year	Caregiver referral within 6 months
Total income instability	1.96**	2.73***	1.81*	2.93***
	[1.23,3.11]	[1.56,4.75]	[1.10,2.99]	[1.63,5.28]
Treatment	0.98	0.94	0.98	0.92
	[0.68,1.42]	[0.59,1.49]	[0.66,1.44]	[0.56,1.51]
Any IA in past three years	2.65***	2.82***	2.43***	2.50**
	[1.68,4.18]	[1.65,4.82]	[1.49,3.94]	[1.38,4.53]
Any substantiation in past 3 years	0.25*	0.11*	0.24*	0.14
	[0.08,0.82]	[0.01,0.87]	[0.06,0.98]	[0.02,1.03]
Missing earnings 2015, QT 2	2.64	2.23	2.95	2.35
	[0.87,8.02]	[0.63,7.93]	[0.87,10.01]	[0.53,10.52]
Missing earnings 2015, QT 3	0.55	0.80	0.60	0.93
	[0.20,1.52]	[0.24,2.63]	[0.20,1.84]	[0.23,3.81]
Missing earnings 2015, QT 4	0.91	0.26	0.77	0.39
	[0.28,3.00]	[0.04,1.46]	[0.21,2.81]	[0.06,2.43]
Missing earnings 2016, QT 1	1.58	0.89	1.35	0.84
	[0.87,2.87]	[0.44,1.77]	[0.72,2.54]	[0.39,1.80]
Missing earnings 2016, QT 2	0.75	1.26	0.89	1.27
	[0.24,2.39]	[0.33,4.85]	[0.26,3.07]	[0.27,6.05]
Income < =5k	1.88	1.93	2.31	2.76
	[0.80,4.41]	[0.70,5.37]	[0.89,5.97]	[0.89,8.57]
5k < Income < =15k	2.05	1.96	2.12	1.98
	[0.94,4.51]	[0.76,5.02]	[0.86,5.22]	[0.66,5.94]
15k < Income < =30k	2.00	1.27	2.28	1.54
	[0.94,4.23]	[0.50,3.22]	[0.98,5.34]	[0.53,4.44]
30k < Income < =50k	1.35	0.53	1.71	0.81
	[0.61,3.01]	[0.18,1.57]	[0.70,4.17]	[0.25,2.60]
Married	0.70	0.80	0.85	1.09
	[0.38,1.32]	[0.37,1.74]	[0.43,1.68]	[0.45,2.66]
Cohabiting	0.90	0.91	0.90	1.19
	[0.56,1.47]	[0.48,1.74]	[0.53,1.52]	[0.59,2.39]
Female	2.39	2.27	1.60	2.60
	[0.83,6.88]	[0.59,8.79]	[0.55,4.62]	[0.48,14.11]
Hispanic	0.70	0.90	0.57	0.97
	[0.37,1.34]	[0.41,1.96]	[0.28,1.17]	[0.41,2.31]
Black	0.98	1.02	0.84	1.04
	[0.61,1.58]	[0.55,1.92]	[0.51,1.40]	[0.53,2.07]
Other	1.59	2.24	1.28	1.51
	[0.57,4.44]	[0.71,7.03]	[0.46,3.57]	[0.47,4.86]
Less than high school	0.90	0.93	0.90	0.90
	[0.54,1.50]	[0.49,1.76]	[0.52,1.55]	[0.45,1.78]
High school	1.22	1.44	1.08	1.29
	[0.79,1.90]	[0.81,2.57]	[0.67,1.72]	[0.69,2.43]
Respondent Age	0.97*	0.99	0.95***	0.97*
	[0.95,0.99]	[0.96,1.01]	[0.92,0.97]	[0.94,1.00]
Born in US	0.71	0.49	0.75	0.51
	[0.32,1.56]	[0.19,1.29]	[0.31,1.81]	[0.17,1.54]
Number of kids in household	1.22**	1.24**	1.20**	1.22*
	[1.08,1.38]	[1.05,1.46]	[1.05,1.37]	[1.02,1.46]
Constant	0.10*	0.04**	0.26	0.04*
	[0.02,0.59]	[0.00,0.41]	[0.04,1.81]	[0.00,0.67]

N = 727.
*p < 0.05, **p < 0.01, ***p < 0.001.
Total income is the combination of income from earnings, SNAP, and TANF.
CV = coefficient of variation (individual-level ratio of standard deviation to the mean).
Confidence intervals shown in brackets.
Regressions computed on 10 multiply imputed datasets. Results are combined using Rubin's rule.
IA = Initial Assessment, the term used in WI for the initial contact with families that results in a case disposition.
White is reference category for race.
More than high school is reference category for education.
Income greater than 50,000 is reference category for income.

parses total income CV into earnings and benefit CV to see how the relationship between instability and child maltreatment changes depending on the source of income instability. Table 5 follows the same modeling pattern for instability, but the allegation type, rather than general CPS investigation, is examined as the outcome.

Mediation models are tested using instability as the predictor variable, socioemotional and behavioral variables as potential mediators, and CPS investigation, in general and by allegation type, as outcomes (Table 6 & Appendix B1). Instability is gauged for the year prior to survey participation, which is when the socioemotional and behavioral variables are measured. Participants are followed in the CPS administrative data for the period of time between baseline and Wave 2 survey completion, approximately one year. This ensures that measure of instability occurred before the self-reported socioemotional health and behaviors, and those characteristics were reported before the measures of CPS involvement. However, some of the survey measures ask respondents to indicate their behaviors and socioemotional health in the past 12 months. Thus, instability and maladaptive behaviors, for example, may be occurring simultaneously. This timing is important for the implications and interpretations of mediation analyses. Two

Table 4
Logistic regression results of CPS involvement regressed on earnings and benefit instability.

Independent Variables	Referral within 1 year	Referral within 6 months	Caregiver referral within 1 year	Caregiver referral within 6 months
Earnings instability	1.47	1.97**	1.37	2.01*
	[0.99,2.17]	[1.20,3.25]	[0.90,2.10]	[1.17,3.45]
Benefit instability	1.20	1.57	1.18	1.88*
	[0.82,1.76]	[0.95,2.58]	[0.78,1.79]	[1.12,3.14]
Constant	0.11*	0.03**	0.29	0.03**
	[0.02,0.61]	[0.00,0.32]	[0.04,1.84]	[0.00,0.43]

N = 727
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
Total income is the combination of income from earnings, SNAP, and TANF.
CV = coefficient of variation (individual-level ratio of standard deviation to the mean).
Confidence intervals shown in brackets.
Regressions computed on 10 multiply imputed datasets. Results are combined using Rubin's rule.
IA = Initial Assessment, the term used in WI for the initial contact with families that results in a case disposition.
White is reference category for race.
More than high school is reference category for education.
Income greater than 50,000 is reference category for income.

Table 5
Logistic regression results of allegation type regressed on instability.

	Neglect within 1 year	Neglect within 6 months	Other abuse within 1 year	Other abuse within 6 months
Panel A				
Total income instability	1.73*	2.66**	1.82	2.22*
	[1.01,2.96]	[1.39,5.09]	[0.98,3.35]	[1.09,4.53]
Panel B				
Earnings instability	1.30	2.02*	1.52	1.04*
	[0.81,2.10]	[1.11,3.67]	[0.88,2.64]	[1.00,1.07]
Benefit instability	1.30	1.50	0.97	1.01
	[0.83,2.05]	[0.83,2.70]	[0.54,1.75]	[0.98,1.05]

N = 727.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
Total income is the combination of income from earnings, SNAP, and TANF.
CV = coefficient of variation (individual-level ratio of standard deviation to the mean).
Confidence intervals shown in brackets.
Neglect categories indicate cases with an allegation of neglect *only*. Other abuse categories indicate all other cases (vast majority are abuse only allegations).
Regressions computed on 10 multiply imputed datasets. Results are combined using Rubin's rule.
Models controlled for treatment status, previous CPS involvement, race, gender, age, income, missing income, education, family structure, family size, and number of kids in household.

indicators for each measure of CPS involvement were also created, differentiating between proximal CPS referrals (within six months of the survey) and more distal CPS referrals (within 12 months). These categories are not mutually exclusive, so the individuals with referrals within six months are also considered individuals with referrals within twelve months. The same temporal distinctions were created for allegation type.

Mediation is assessed using the product of the coefficients method (*sureg* Stata command). All predictor, mediator, and outcome variables were standardized to ease interpretation. Using this method, the indirect effect is found by multiplying the regression coefficients of predictor and mediator variables as well as obtaining the standard error of that multiplied coefficient. The coefficient is divided by its standard error to evaluate the statistical significance of the indirect effect. The indirect effect can then be divided by the total effect to measure the percentage of the effect that is mediated. For example, from Fig. 1, the indirect effect is $[a_1 * b_1]$ and the total effect is $[a_1 * b_1 + c_1]$. This method is particularly useful with multiply imputed datasets because it combines the computed indirect effects for each imputed data set using Rubin's rule (UCLA Statistical Consulting Group, n.d.).

5. Results

5.1. Descriptive results

Descriptive statistics are presented in Table 1, and means are shown for four groups: any referral within the year, no referral within the year, neglect referral within the year, and other abuse referral within the year. Looking at the entire sample, just over twenty percent had at least one repeat CPS referral in the year between Wave 1 and Wave 2 survey collection. And over half of that had a repeat referral in the first six months after the Wave 1 survey. Most of those referrals were referrals with the primary caregiver named as the alleged maltreater (19.1%). About 15.3% of participants had an allegation of neglect only, which is 66.9% of total referrals in the year following the survey. This is not surprising given that neglect cases constitute the majority of child welfare caseloads. The majority of the sample is single, black, and has an annual, self-reported income of less than $30,000. This is consistent with the demographic characteristics we know are overrepresented in the child welfare system.

Mean differences are tested between individuals with a referral (N = 166) compared to those without a referral (N = 561), and individuals with a neglect only referral (N = 111) compared to those with another type of abuse referral (N = 55). Individuals with a referral are significantly more likely to have had a prior Initial Assessment (IA; investigation) in the past three years (other than that which resulted in

Table 6
Indirect effects of substance use on child maltreatment via income instability.

Substance use	ß		ß
Income Instability	0.11**		
	(0.04)		
Referral within six months		Caregiver referral within six months	
Substance use	0.02	Substance use	0.04
	(0.04)		(0.04)
Income instability	0.12***	Income instability	0.12**
	(0.04)		(0.04)
Indirect effect	0.00	Indirect effect	0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)
Referral within year		Caregiver referral within year	
Substance use	0.07 +	Substance use	0.07 +
	(0.04)		(0.04)
Income instability	0.09*	Income instability	0.07 +
	(0.04)		(0.04)
Indirect effect	0.01	Indirect effect	0.01
	(0.01)		(0.01)
Total effect	0.10**	Total effect	0.08*
	(0.04)		(0.04)
Neglect within six months		Other abuse within six months	
Substance use	0.08*	Substance use	−0.07 +
	(0.04)		(0.04)
Income instability	0.11**	Income instability	0.08*
	(0.04)		(0.04)
Indirect effect	0.01 +	Indirect effect	−0.01
	(0.01)		(0.01)
Total effect	0.12**	Total effect	0.07 +
	(0.04)		(0.04)
Neglect within year		Other abuse within year	
Substance use	0.11**	Substance use	−0.04
	(0.04)		(0.04)
Income instability	0.05	Income instability	0.07 +
	(0.04)		(0.04)
Indirect effect	0.01*	Indirect effect	−0.01
	(0.01)		(0.01)
Total effect	0.07 +	Total effect	0.07 +
	(0.04)		(0.04)

N = 727; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
Results from separated, unrelated regression analyses (sureg command in Stata). All variables are standardized.
Total income is the combination of income from earnings, SNAP, and TANF.
CV = coefficient of variation (individual-level ratio of standard deviation to the mean).
Neglect categories indicate cases with an allegation of neglect *only*. Other abuse categories indicate all other cases (vast majority are abuse only allegations).
Regressions computed on 10 multiply imputed datasets. Results are combined using Rubin's rule.
Models controlled for treatment status, previous CPS involvement, race, gender, age, income, missing income, education, family structure, family size, and number of kids in household.

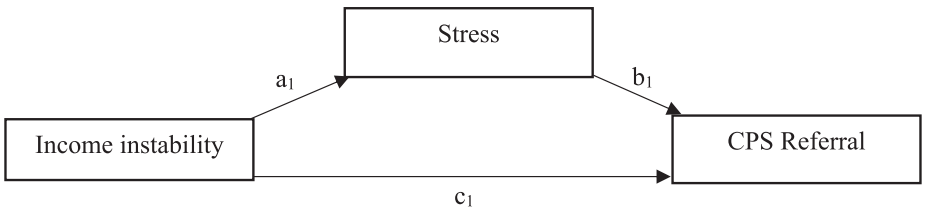
sample inclusion) and have a significantly lower total household income compared to those without a referral. Individuals with a referral are more likely to be young, white, single females with more children in the home. Those with a referral also present higher levels of economic stress and substance use than their peers without a referral. Moreover, individuals with a referral have significantly more income instability and benefit receipt, and significantly less earnings compared to those without a referral. These differences suggest that families with referrals are more economically disadvantaged.

Of the individuals with a referral, mean differences were tested between those with a neglect only allegation and those with an allegation of other forms of abuse. Individuals with a neglect only referral were similar to their peers with another abuse referral across all demographic characteristics. Not surprisingly, individuals with an allegation of abuse other than neglect reported higher levels of physical assault in their parenting practices. Interestingly, those with neglect only referrals reported greater substance use, suggesting that families abusing substances are more likely to come into contact with CPS for reasons of neglect. No significant mean differences were found in income sources between those with a neglect only referral compared to their peers with another abuse referral. Similarly, there are no significant differences in measures of instability. Thus, differences in economic resources are likely not contributing to the likelihood of a family having a neglect allegation versus an abuse allegation in this population.

Similar to the method of Morduch and Siwicki (2017), Table 2 presents descriptive statistics of the role of welfare benefits in income instability. The average CV for total income is 0.365, which suggests an average of 37% dispersion of income around an individual's mean income over the course of a year. That is fairly large variation. The CV of earnings (income without benefits) is 0.491, suggesting a 49% dispersion of earnings relative to the mean, an even larger amount of variation. The reduction in the CV after adding benefits (0.49 for earnings compared to 0.37 for total income), suggests that welfare benefits do have an income-smoothing effect for low-income families. Comparing mean earnings (income without benefits) to mean total income (including benefits) indicates that benefits account for a 35.3% increase in income in this sample. Comparing the average standard deviation (SD) of income with and without benefits indicates that benefits account for an increase of 7.3% in the average standard deviation—suggesting greater variation in income when benefits are included. This shows that benefit receipt reduces a household's overall CV by driving up the average income, though not necessarily reducing the variability in that income. Thus, while receiving benefits is helpful in that it supplements economic resources in the home, it is not demonstrating an ability to reduce variation in overall income.

5.2. Regression results: Direct associations

Table 3 shows results of logit models regressing CPS involvement on income instability. Total income instability is significantly associated with all types of CPS involvement, and the ORs show instability increases risk of CPS involvement. This suggests that experiencing more instability in the year prior to the survey increases risk of CPS involvement in the following six months and the following year. The



5. RESULTS

Fig. 1. Theoretical path model for mediation analysis.

coefficients of total income instability are largest for the association between instability and proximal measures of CPS involvement. This suggests the adverse effects of income instability are more salient in the immediate six months compared to over the full twelve months. Indeed, the odds ratios suggest that an increase in the CV for income instability from 0 to 1 (which is equivalent of a change from no variation in income to variation equal to the mean) would almost triple the odds of a referral in the next six months (OR = 2.73, 2.93, $p < 0.001$). For CPS referrals within the following year, an increase in the CV of income instability from 0 to 1 is associated with a 96% increased chance of any referral and an 81% increased chance of a caregiver referral. Overall, these initial results suggest increasing income instability substantially increases risk for CPS involvement, even after accounting for income level.

Of the covariates, the most important predictors of a referral are any previous CPS investigation in the prior three years and the number of children in the household, both of which are positively associated with referral. Also consistent with prior literature, older respondents are slightly less likely to be referred. Any substantiation in the past three years shows a fairly large, negative association with all types of CPS involvement, which is surprising. Further investigation showed 90% of families with a substantiation in the prior three years had allegations of physical abuse. Accordingly, one possible explanation is that because a majority of CPS reports allege neglect to a child (Maltreatment, 2017), families with extensive physical abuse histories may be less likely to be reported than their peers. Additionally, families with a substantiation often receive the most intensive supports and services from CPS, which may reduce their likelihood of referral in the following year. Interestingly, there are no significant associations of race/ethnicity, income, or education with referral, despite these being common predictors in the literature. This may reflect that, once income instability is accounted for, these factors are no longer as salient. Conversely, it may simply reflect a lack of statistical power and relatively large number of correlated covariates. Indeed, though non-significant, most of the coefficients function in expected directions and many are relatively large in magnitude.

Table 4 presents results when total income is parsed into earnings instability and benefit instability. Covariates are not shown in this table, but patterns are consistent with Table 3. The general pattern suggests that both earnings and benefit instability are associated with increased CPS involvement, though most of the estimates fail to attain statistical significance. Indeed, the only significant estimates are for the associations between earnings instability and referral (any and caregiver) within 6-months and that between benefit instability and caregiver-related referral within 6-months. The odds ratios indicate that an increase in the CV from 0 to 1 is associated with doubling the odds of any referral and caregiver referral in the following six months (OR = 1.97, $p < 0.01$; 2.01, $p < 0.05$). The odds ratio for benefit instability indicates an 88% increased odds of caregiver referral in the next six months given an increase in income instability. Overall, although it is important to note some associations do not reach statistical significance, these results suggest that earnings instability has a moderate association with CPS referrals both in general and caregiver-specific referrals. This association is strongest for proximal CPS involvement. Benefit instability is more closely linked to short-term than long-term referrals and is more salient with respect to caregiver-specific referrals than referrals in general.

Table 5 presents the income instability results by referral allegation type, using measures of any (rather than caregiver-specific) referral within 6 months and one year. Covariates are not shown in these table, but patterns are consistent with Table 3. The results in Panel A indicate that total income instability is similarly associated with increased referrals across all four measures, with a modestly large effect size. Of particular note, the estimates suggest that an increase in the CV of income instability from 0 to 1 is associated with nearly tripling the odds of a neglect only referral within 6 months and doubling the odds of another type of abuse allegation within 6 months. The results when instability is examined separately for earnings and benefits (Panel B) are less compelling; they are largely nonsignificant, except for significant associations of earnings instability with six-month neglect only and other abuse allegations. The coefficient size is negligible for other abuse allegations, but the odds ratio for neglect allegations indicates an increase in income instability doubles the odds of a neglect allegation in the next six months. The estimates for benefit instability are nonsignificant for each outcome and small in magnitude for other abuse, though modestly large in magnitude for neglect only. In sum, Table 5 suggests earnings instability has implications for proximal neglect and maltreatment behaviors, though the implications for neglect are most salient.

5.3. Regression results: Mediation

Mediation pathways for associations between all measures of income instability and all maltreatment indicators were tested for normative parenting behaviors, maltreatment behaviors, stress, and maladaptive behaviors. The results of these mediation tests were largely null, and all variables but one had no notable association with income instability and maltreatment indicators. That is, the vast majority of indirect effects of the mediating variables are statistically insignificant and almost all zero or close to zero in magnitude. Appendix B1 summarizes these results for the all of the potential mediators, focusing on total income instability and referrals within six months only. Table 6 shows mediation results for substance use—the only potential mediator for which there was an evidence of mediation. Note that these analyses used independent, linear regressions with standardized variables instead of logistic regressions, for ease of interpretation. As such, the estimates will not precisely mirror the coefficients discussed in the logistic regression results. Coefficients are interpreted as a percentage point change in the standardized outcome associated with a one standard deviation change in the predictor or mediator.

Turning to Table 6, consistent with the logit results (Tables 3 and 4), total income instability is associated with an increased likelihood of any referral and caregiver referral within six months. The notable mediating effect of parental substance use occurs between income instability and neglect within a year and within six months. For the association between total income instability and a neglect referral in the following year, substance use demonstrates a significant indirect effect, mediating 14.3% (indirect effect/total effect) of the association. For a neglect allegation in the next six months, substance use has a marginally significant indirect effect, mediating 8.3% of the association. For referrals within six months, other abuse referral within six months, and other abuse referral within one year, substance use does not have a significant indirect effect. In sum, Table 6 demonstrates that substance use acts as a mechanism of the relationship between income instability and neglect referrals, and this mediating effect is most salient for neglect referrals in the following year.

6. Discussion

This study investigates the unique role of income instability—beyond the influence of income level—in predicting child maltreatment. Potential mechanisms of this association were also

explored. Theoretical considerations led to a hypothesis that income instability would have an association with child maltreatment outcomes distinct from income level due to the added stress, chaos, and unpredictability that likely accompanies significant income instability. Indeed, results of logistic regressions suggest income instability increases the odds of child maltreatment, as approximated by CPS involvement, even after controlling for household income at the time of the survey. The association of instability with CPS referrals in the next six months was most robust, suggesting an approximate tripling of the odds of referral for every one-unit increase in instability. This suggests a fairly large added risk for proximal child maltreatment when experiencing significant increases in income instability. The findings also suggest an increased risk of a CPS referral in the following year, but the increased odds are smaller. As such, it seems the impact of instability on CPS involvement is more immediate. This has implications for policy and practice. If unstable economic resources are increasing risk for CPS involvement beyond the influence of scarce economic resources, it warrants a closer look at what events these families are experiencing that may be driving this instability and its association with child maltreatment. Such life events (e.g., health issue, relationship dissolution) may contribute to omitted variable bias to the extent they are driving economic instability and maltreatment. Thus, it is important to expand future work to include measures of negative life events. More work is also needed to understand the role of involvement with CPS professionals and other social workers during times of instability that may, in turn, increase the likelihood of a referral, particularly given the large proportion of this sample using social services. With a deeper understanding of the roles of these omitted variables, certain events, economic patterns, and relationships could be identified as factors for policymakers to consider when designing policies and programs to smooth the instabilities or ease the economic stress of families at-risk for child maltreatment.

When instability is parsed into earnings and benefit information, earnings instability is associated with increased odds for a proximal referral, and benefit instability is associated with increased odds for a proximal caregiver referral. Although the estimates do not always attain statistical significance, the estimates for earnings instability are of moderate magnitude for referrals both within 6 months and within a year, and those for benefit instability are of moderate magnitude for referrals within 6 months. Thus, benefit instability has a more salient influence on CPS involvement in the near future. This warrants further work to delve deeper into what factors are driving these associations and why, given implications of these findings that earnings and benefit instability do increase risk differently. However, when compared to the results of total income instability, it seems the combined effect of earnings and benefit instability is the most salient for increasing risk of child maltreatment, particularly in the near future. When considering how to improve stability of income to attenuate this increased risk of child maltreatment, it will be necessary to attend to the stability of both earnings and benefits for the largest impact.

Regarding the relationship of instability with the type of maltreatment allegation, instability shows the strongest association with neglect only. Similar to the results for types of CPS involvement, instability is most strongly associated with proximal neglect allegations and proximal allegations of other abuse. When instability is split into earnings and benefit instability, earnings instability is associated with increased risk of neglect and other abuse allegations in the next six months, and this association is strongest for neglect only allegations within six months. Taken together, these findings suggest that income instability increases risk for CPS involvement in the proximal future through behaviors or circumstances associated with neglect and abuse, but it has a lasting effect on increasing risk for neglect only. The realities of experiencing unpredictable or changing economic resources may result in the inability to provide for basic needs or caregiving duties due to the sheer lack of resources or economic slack. In turn, this would increase the likelihood of a CPS referral for neglect.

On the other hand, earnings instability is associated with joint neglect and abuse behaviors, suggesting the effects of significant earnings instability may play out through abusive behaviors and neglect behaviors. Taken together, these results reinforce the finding that instability is more salient for proximal CPS referrals. They also add to our understanding of the influence of instability on child maltreatment in that total income instability seems to increase the odds of neglectful behaviors, while earnings instability also increases the risk of abusive behaviors. Thus, when designing policies for child welfare families or working with families directly, it may be important to attend to the pattern of their economic resources – particularly patterns within distinct components of income – and have supports in place to help families continue to provide care and safe environments for children when experiencing significant income instability.

Turning to the mediation analyses, results offer no support for the mediating role of socioemotional and parenting behaviors in the relationship between income instability and child maltreatment. Thus, the theoretical hypotheses that income instability increases stress and poor parenting to consequently increase maltreatment are unsupported in this sample. If income instability was increasing parenting stress and harsh, punitive parenting, I would have expected parenting distress and maltreatment behaviors to be significant mediating variables. Yet, it seems associations of income instability and CPS referral are not operating through these factors. It may also be that parenting behaviors and beliefs, as measured in survey data, are not reliable predictors of maltreatment compared to measures of factual characteristics (e.g., household size, age). Future work should focus on economic factors and other concrete measures as mediators of this relationship (e.g., evictions, food hardship, job loss) rather than socioemotional and behavioral reports.

Interestingly, income instability does seem to operate to some extent through substance use, which in turn increases the risk of a neglect allegation in the following year and the following six months. However, because participants reported substance use behavior over the past 12 months (concurrent time frame to measure of income instability), it is important for future work to further investigate the temporal ordering of the association between instability and substance use. A fairly small amount of the association between instability and neglect allegations is explained by substance use (~14%), but it does suggest a need to focus on substance use behaviors in response to varying economic resources. Moreover, given that parents abusing illicit substances are more likely to be substantiated for maltreatment (Victor, Grogan-Kaylor, Ryan, Perron, & Gilbert, 2018), this path from income instability to substance use to neglect seems particularly worrisome. Given that substance use allegations were included in the definition of other abuse, it is interesting that substance use did not have a significant mediating role in predicting other abuse allegations. This is likely because there is only one participant in the *other abuse* category (1.8%) with an allegation of substance use in the period following survey collection. This is not surprising given that substance use allegations constitute less than five percent of all allegations. Overall, these findings suggest it would be useful for policy and practice addressing substance use in the child welfare population to also consider how unstable economic resources may be associated with increased substance use and neglect behaviors. Additionally, child welfare stakeholders should continue to consider how social welfare policies and

child welfare practice can support families economically. Previous literature demonstrates the role of income support policies in reducing rates of child maltreatment (e.g., child support, EITC; Berger, Font, Slack, & Waldfogel, 2017; Cancian, Yang, & Slack, 2013), and this study suggests it is necessary to expand these types of analyses to understand how income supports policies can assist families in times of instability to promote income-smoothing and stability for children and families.

6.1. Limitations

There are notable limitations in this study that must be considered when interpreting the findings. First, this sample is exclusively from an urban area of Milwaukee County. As such, the findings may not be generalizable outside of such context. However, the findings do offer evidence for a unique relationship between instability and child maltreatment that nationally representative data systems should consider testing as well. Second, this study is conducted with a sample of individuals who chose to participate in the survey. As such, there may be selection bias in that the families in this sample are more advantaged and demonstrate more protective factors through their willingness and ability to participate in the survey. This could result in an underestimation of income instability and its effects if these families have more resources at their disposal than the general population of families at-risk for CPS involvement. Survey weights were applied to the analyses in efforts to adjust for this bias.

Third, the administrative measure of income instability captures only one adult's earnings. Given that some of the families reported a married or cohabiting relationship status, I am likely missing a significant amount of household income in this measure of instability. It is hard to know if measuring all adult earnings would increase or decrease instability. Having a second source of income may buffer against any fluctuations in the participant's earnings and benefits, but if that second source of income is also subject to frequent volatility, it could add to the instability of a household. Regardless, the current findings suggest that an individual's income instability is associated with child maltreatment, which, itself, has important implications for how social policy and child welfare programs can support parents in the child welfare system. Moreover, a majority of the sample is single-mother families. Thus, having information on a partner's income would impact the instability measure of less than half the sample. As such, the bias in results from this omitted information is ideally small.

Fourth, the survey measures use self-reported information. Thus, these measures may not accurately represent important constructs like parenting beliefs or maltreatment behaviors, as participants' responses may reflect social desirability bias. Given the positive association of income instability and CPS involvement in these findings, it is important for future work to explore more reliable measures of parenting and maltreatment behaviors (e.g., observational methods, qualitative interviews), to accurately understand the potential of parenting supports as useful interventions to mitigate the association of economic instability and child maltreatment.

Finally, this study intended to examine the role of income instability on child maltreatment, regardless of the direction of that instability. This was an appropriate starting point since no study has previously examined the association of income instability, measured through multiple within-year time points, and child maltreatment. The findings suggest income instability does have a unique association with child maltreatment, but it does not differentiate if increases in income, decreases in income, or both are driving that association. Moreover, the magnitude of instability matters. A drop in income of $100 from one quarter to the next will affect a household differently than a drop in income of $1000. Thus, future work should consider the magnitude and direction of changes in income to more fully understand *how* income instability is influencing child maltreatment.

7. Conclusion

The present study linked administrative and survey data of a population of low-income families at-risk for CPS involvement to investigate the association between income instability and child maltreatment, as approximated by CPS investigations, as well as its mechanisms. This study is unique in its ability to link survey and administrative data in order to access reliable measures of earnings, benefits, and CPS involvement, while also gauging socioemotional and behavioral variables at an individual level. Results suggest that total income instability does have a uniquely adverse relationship with child maltreatment, and it is particularly salient for contact with CPS in the next six months and neglect allegations. Socioemotional and parenting factors do not mediate this association between income instability and child maltreatment. Substance use marginally mediates the relationship, which suggests increases in income instability are associated with substance use that, in turn, increases risk for child maltreatment. These results have implications for social welfare policy. If increasingly unstable incomes are associated with increased odds of CPS involvement and child neglect – beyond the effects of income level – it seems pertinent to investigate how our social welfare policies could more effectively smooth families' incomes and how child welfare practice could support families in times of instability. Moreover, given the importance of substance use that emerged, more attention should be paid to the influence of growing income volatility on substance use for low-income families. And while these findings only have direct implications for urban areas of Wisconsin, they offer guidance for future work to investigate these associations in nationally representative populations.

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Appendix A

See Table A1.

Table A1
Description of variables before and after imputation.

	After imputation (M/SD)	Before imputation (M/SD)
Total income	27,357	27,631
	(1045)	(26732)
Respondent Age	35.38	35.37
	(0.36)	(9.41)
Attention	2.96	2.95
	(0.01)	(0.38)
Parental distress	2.23	2.23
	(0.02)	(0.61)
Affection	4.15	4.15
	(0.02)	(0.60)
Impatience	2.50	2.50
	(0.04)	(1.00)
Psych aggression	1.56	1.56
	(0.03)	(0.67)
Physical assault	1.30	1.30
	(0.02)	(0.45)
Neglect	1.42	1.42
	(0.02)	(0.52)
Economic stress	2.45	2.46
	(0.03)	(0.81)
Substance use	0.09	0.09
	(0.01)	(0.22)
Illegal activities	0.23	0.23
	(0.03)	(0.73)
Routines	3.40	3.40
	(0.01)	(0.38)

M = mean.
SD = standard deviation.
Data imputed 10 times.

Appendix B

See Table B1.

Table B1
Indirect effects of all mediating variables via total income instability.

Parental distress	ß		ß
Income Instability	−0.04		
	(0.04)		
Referral within six months		Caregiver referral within six months	
Parental distress	0.01	Parental distress	−0.01
	(0.04)		(0.04)
Income instability	0.13***	Income instability	0.12**
	(0.04)		(0.04)
Indirect effect	−0.00	Indirect effect	0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)
Economic stress			
Income Instability	−0.02		
	(0.04)		
Referral within six months		Caregiver referral within six months	
Economic stress	0.06	Economic stress	0.04
	(0.04)		(0.04)
Income instability	0.13***	Income instability	0.12**
	(0.04)		(0.04)
Indirect effect	−0.00	Indirect effect	−0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)

(*continued on next page*)

Table B1 (*continued*)

Physical assault			
Income Instability	−0.03		
	(0.04)		
Referral within six months		Caregiver referral within six months	
Physical assault	−0.01	Physical assault	−0.00
	(0.04)		(0.04)
Income instability	0.13***	Income instability	0.12**
	(0.04)		(0.04)
Indirect effect	0.00	Indirect effect	0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)
Neglect	−0.01	Neglect	
Income Instability	(0.04)	Income Instability	
Referral within six months		Caregiver referral within six months	
Neglect	−0.00	Neglect	0.04
	(0.04)		(0.04)
Income instability	0.13***	Income instability	0.12**
	(0.04)		(0.04)
Indirect effect	−0.00	Indirect effect	−0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)
Psychological aggression			
Income Instability	0.01		
	(0.04)		
Referral within six months		Caregiver referral within six months	
Psychological aggression	0.01	Psychological aggression	0.00
	(0.04)		(0.04)
Income instability	0.13***	Income instability	0.12**
	(0.04)		(0.04)
Indirect effect	0.00	Indirect effect	0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)
Attention			
Income Instability	0.04		
	(0.04)		
Referral within six months		Caregiver referral within six months	
Attention	0.04	Attention	0.04
	(0.04)		(0.04)
Income instability	0.13***	Income instability	0.12**
	(0.04)		(0.04)
Indirect effect	−0.00	Indirect effect	−0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)
Affection			
Income Instability	−0.00		
	(0.04)		
Referral within six months		Caregiver referral within six months	
Affection	0.01	Affection	0.01
	(0.04)		(0.04)
Income instability	0.13***	Income instability	0.12**
	0.01		0.01
Indirect effect	−0.00	Indirect effect	−0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)
Impatience			
Income Instability	−0.06 +		
	(0.04)		
Referral within six months		Caregiver referral within six months	
Impatience	0.02	Impatience	0.01
	(0.04)		(0.04)
Income instability	0.13***	Income instability	0.12**
	(0.04)		(0.04)

(*continued on next page*)

Table B1 (*continued*)

Indirect effect	−0.00	Indirect effect	−0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)
Routines			
Income Instability	0.06+		
	(0.04)		
Referral within six months		Caregiver referral within six months	
Routines	0.04	Routines	0.04
	(0.04)		(0.04)
Income instability	0.12***	Income instability	0.12**
	(0.04)		(0.04)
Indirect effect	0.00	Indirect effect	0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)
Illegal			
Income Instability	0.06		
	(0.04)		
Referral within six months		Caregiver referral within six months	
Illegal	0.06+	Illegal	0.04
	(0.04)		(0.04)
Income instability	0.12***	Income instability	0.12**
	(0.04)		(0.04)
Indirect effect	0.00	Indirect effect	−0.00
	(0.00)		(0.00)
Total effect	0.13	Total effect	0.12
	(0.04)		(0.04)

N = 727.
+$p < 0.10$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
Total income is the combination of income from earnings, SNAP, and TANF.
CV = coefficient of variation (individual-level ratio of standard deviation to the mean).
Neglect categories indicate cases with an allegation of neglect *only*. Other abuse categories indicate all other cases (vast majority are abuse only allegations).
Regressions computed on 10 multiply imputed datasets. Results are combined using Rubin's rule.
Models controlled for treatment status, previous CPS involvement, race, gender, age, income, missing income, education, family structure, family size, and number of kids in household.
Results from separated, unrelated regression analyses (sureg command in Stata).

Appendix C. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.childyouth.2019.104596.

References

Abidin, R. R. (1995). *Parenting Stresss Index (PSI) manual* (3rd ed.). Charlottesville, VA: Pediatric Psychology Press.

Beck, A. N., Cooper, C. E., McLanahan, S., & Brooks-Gunn, J. (2010). Partnership transitions and maternal parenting. *Journal of Marriage and Family, 72*, 219–233.

Bentler, P. M. (1992). Etiologies and consequences of adolescent drug use: Implications for prevention. *Addictive Diseases, 11*, 47–61.

Berger, L. M., Cancian, M., Cuesta, L., & Noyes, J. L. (2016). Families at the intersection of the criminal justice and Child Protective Services systems. *The Annals of the American Academy of Political and Social Science, 665*, 171–194.

Berger, L. M., Font, S. A., Slack, K. S., & Waldfogel, J. (2017). Income and child maltreatment in unmarried families: Evidence from the earned income tax credit. *Review of Economics of the Household, 15*, 1345–1372.

Berger, R. P., Fromkin, J. B., Stutz, H., Makoroff, K., Scribano, P. V., Feldman, K., ... Fabio, A. (2011). Abusive head trauma during a time of increased unemployment: A multicenter analysis. *Pediatrics, 128*, 637–643.

Bitler, M., & Hoynes, H. (2016). The more things change, the more they stay the same? The safety net and poverty in the Great Recession. *Journal of Labor Economics, 34*, s403–s444.

Boardman, J. D., Finch, B. K., Ellison, C. G., Williams, D. R., & Jackson, J. S. (2001). Neighborhood disadvantage, stress, and drug use among adults. *Journal of Health and Social Behavior, 42*, 151–165.

Brown, D., & De Cao, E. (2017). The impact of unemployment on child maltreatment in the United States. University of Oxford Department of Economics Discussion Paper, 837.

Brown, R. L., & Rounds, L. A. (1995). Conjoint screening questionnaires for alcohol and other drug abuse: Criterion validity in a primary care practice. *Wisconsin Medical Journal, 94*(3), 135–140.

Cancian, M., & Danziger, S. (2009). *Changing poverty, changing policy*. New York, NY: Russell Sage.

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

Child Maltreatment (2017). The Children's Bureau, U.S. Department of Health & Human Services, Administration for Children and Famlies. Retrieved from https://www.acf.hhs.gov/sites/default/files/cb/cm2017.pdf.

Coldwell, J., Pike, A., & Dunn, J. (2006). Household chaos – Links with parenting and child behavior. *The Journal of Child Psychology and Psychiatry, 47*, 1116–1122.

Compton, W. M., Gfroerer, J., Conway, K. P., & Finger, M. S. (2014). Unemployment and substance outcomes in the United States 2002–2010. *Drug and Alcohol Dependence,* 350–353.

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

Conger, R. D., Conger, K. J., & Martin, M. J. (2010). Socioeconomic status, family processes, and individual development. *Journal of Marriage and Family, 72*, 685–704.

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

Congressional Budget Office (2008). *Recent trends in the variability of individual earnings and household income, 1–32.* Washington: Congressional Budget Office.

Corapci, F., & Wachs, T. D. (2002). Does parental mood or efficacy mediate the influence of environmental chaos upon parenting behavior. *Merrill-Palmer Quarterly, 48*, 182–201.

DeNavas-Walt, C., Proctor, B. D., & Smith, J. C. (2009). *Income poverty and health insurance coverage in the United States: 2008.* Washington, DC: U.S. Department of Commerce, Census Bureau.

Dynan, K., Elmendor, D., & Sichel, D. (2012). The evolution of household income volatility. *The B.E. Journal of Economic Analysis & Policy, 12*.
Ehrlich, I. (1973). Participation in illegitimate activities: A theoretical and empirical investigation. *Journal of Political Economy, 8*, 521–565.
Eitle, D., & Turner, R. J. (2003). Stress exposure, race, and young adult male crime. *The Sociological Quarterly, 44*, 243–269.
Engle, P. L., & Black, M. M. (2008). The effect of poverty on child development and educational outcomes. *Annals of the New York Academy of Sciences, 1136*, 243–256.
Entorf, H. (2009). Crime and the labour market: Evidence from a survey of inmates. *Journal of Economics and Statistics, 220*, 254–269.
Evans, G. W., & Wachs, T. D. (2010). *Chaos and its influence on children's development.* Washington, DC: American Psychological Association.
Fein, D. J., & Lee, W. S. (2003). The impacts of welfare reform on child maltreatment in Delaware. *Children and Youth Services Review, 25*, 83–111.
Fredericks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*, 59–109.
Gennetian, L. A., & Shafir, E. (2015). The persistence of poverty in the context of financial instability: A behavioral perspective. *Journal of Policy Analysis and Management, 34*, 904–936.
Gennetian, L. A., Castells, N., & Morris, P. A. (2010). Meeting the basic needs of children: Does income matter? *Children and Youth Services Review, 32*, 1138–1148.
Gennetian, L. A., Rodriques, C., Hill, H. D., & Morris, P. A. (2018). Income level and volatility by children's race and Hispanic ethnicity. *Journal of Marriage and Family, 81*, 204–229.
Gennetian, L. A., Wolf, S., Hill, H. H., & Morris, P. A. (2015). Intrayear household income dynamics and adolescent school behavior. *Demography, 52*, 455–483.
Gottschalk, P., Moffitt, R., Katz, L. F., & Dickens, W. (1994). The growth of earnings instability in the U.S. labor market. *Brookings Papers on Economic Activity, 2*, 217–272.
Grandner, M. A., Patel, N. P., Gehrman, P. R., Xie, D., Sha, D., Weaver, T., & Gooneratne, N. (2010). Who gets the best sleep? Ethnic and socioeconomic factors related to sleep complaints. *Sleep Medicine, 11*, 470–478.
Hafekost, K., Lawrence, D., O'Leary, C., Bower, C., O'Donnell, M., Semmens, J., & Zubrick, S. R. (2017). Maternal alcohol use disorder and subsequent child protection contact: A record-linkage population cohort study. *Child Abuse & Neglect, 72*, 206–214.
Hardy, B. L. (2014). Childhood income volatility and adult outcomes. *Demography, 51*, 1641–1665.
Hardy, B. L. (2017). Income instability and the response of the safety net. *Contemporary Economic Policy, 35*, 312–330.
Hardy, B., & Ziliak, J. P. (2014). Decomposing trends in income volatility: The "wild ride" at the top and bottom. *Economic Inquiry, 52*, 459–476.
Hill, H. D., Morris, P., Gennetian, L. A., Wolf, S., & Tubbs, C. (2013). The consequences of income instability for children's well-being. *Child Development Perspectives, 7*, 85–90.
Hussey, J. M., Chang, J. J., & Kotch, J. B. (2006). Child maltreatment in the United States: Prevalence, risk factors, and adolescent health. *Pediatrics, 118*, 993–1942.
Jorda, O., Schularick, M., & Taylor, A. M. (2011). Financial crises, credit booms, and external imbalances: 140 years of lessons. *IMF Economic Review, 59*, 340–378.
Kelley, S. J. (1998). Stress and coping behaviors of substance-abusing mothers. *JSPN, 3*, 103–110.
Kim, H., & Drake, B. (2018). Child maltreatment risk as a function of poverty and race/ethnicity in the USA. *International Journal of Epidemiology, 47*, 780–787.
Kinsey, S. H., Thornberry, J. S., Carson, C. P., & Duffer, A. P. (1995). Respondents preferences toward audio-CASI and how that affects data quality. American Association for Public Opinion Research: Proceedings of the Survey Research Methods Section, American Statistical Association, 1223–1228. Retrieved from: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.568.6929&rep=rep1&type=pdf.
Lindenberg, C. S., Gendrop, S. C., & Reiskin, H. K. (1993). Empirical evidence for the social stress model of substance use. *Research in Nursing & Health, 16*, 351–362.
Masarik, A. S., & Conger, R. D. (2017). Stress and child development: A review of the family stress model. *Current Opinion in Psychology, 13*, 85–90.
McLaughlin, M. (2017). Less money, more problems: How changes in disposable income affect child maltreatment. *Child Abuse & Neglect, 67*, 315–321.
Mills, G., & Amick, J. (2010). Can savings help overcome income instability? The Urban Institute, 18. Retrieved from: http://beta.accesstofinancialsecurity.org/sites/default/files/CanSavingsHelpOvercomeIncomeInstability_UrbanInstitute_1.pdf.
Moffitt, R., & Ribar, D. C. (2008). Variable effects of earnings volatility on Food Stamp participation. In D. Joliffe, & J. P. Ziliak (Eds.). *Income volatility and food assistance in the United States* (pp. 35–62). Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.
Morduch, J., & Schneider, R. (2017). *The financial diaries: How American families cope in a world of uncertainty.* Princeton, NJ: Princeton University Press.
Morduch, J., & Schneider, R. (n.d.). Spikes and dips: How income uncertainty affects households. U.S. Financial Diaries, Issue 1. Retrieved from http://www.usfinancialdiaries.org/issue1-spikes.
Morduch, J., & Siwicki, J. (2017). In and out of poverty: Episodic poverty and income volatility in the US Financial Diaries. *Social Service Review, 91*, 390–421.
Morris, P. A., Hill, H. D., Gennetian, L. A., Rodrigues, C., & Wolf, S. (2015). Income volatility in U.S. households with children: Another growing disparity between the rich and the poor? IRP Discussion Paper, 1429-15.
Neger, E. N., & Prinz, R. J. (2015). Interventions to address parenting and parental substance use: Conceptual and methodological considerations. *Clinical Psychology Review, 39*, 71–82.
Newman, C. (2006, August). The income volatility see-saw: Implications for school lunch (Economic Research Report No. 23). Washington, DC: United States Department of Agriculture, Economic Research Service.
Nomaguchi, K., & Johnson, W. (2016). Parenting stress among low-income and working-class fathers: The role of employment. *Journal of Family Issues, 37*, 1535–1557.
O'Reily, H. M., Hubbard, M. L., Lessler, J. T., Beimer, P. P., & Turner, C. F. (1994). Audio and vido computer assisted self-interviewing: Preliminary tests of new technologies for data collection. *Journal of Official Statistics, 10*, 197–214.
Osborne, C., Berger, L. M., & Magnuson, K. (2012). Family structure transitions and changes in maternal resources and well-being. *Demography, 49*, 23–47.
Parke, R. D., Coltrane, S., Duffy, S., Buriel, R., Dennis, J., Powers, J., ... Widaman, K. F. (2004). Economic stress, parenting, and child adjustment in Mexican American and European American families. *Child Development, 75*, 1632–1656.
Paxson, C., & Waldfogel, J. (2003). Welfare reforms, family resources, and child maltreatment. *Journal of Policy Analysis and Management, 22*, 85–113.
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*, 92–103.
Rhoades, G. K., Kamp Dush, C. M., Atkins, D. C., Stanley, S. M., & Markman, H. J. (2011). Breaking up is hard to do: The impact of unmarried relationship dissolution on mental health and life satisfaction. *Journal of Family Psychology, 25*, 366–374.
Schneider, W., Waldfogel, J., & Brooks-Gunn, J. (2017). The Great Recession and risk for child abuse and neglect. *Children and Youth Services Review, 72*, 71–81.
Sedlak, A. J., Mettenburg, J., Basena, M., Petta, I., McPherson, K., Greene, A., & Li, S. (2010). Fourth national incidence study of child abuse and neglect (NIS-4): Report to congress. Washington, DC: US Department of Health and Human Services, Administration for Children and Families.
Shanahan, M. E., Runyan, D. K., Martin, S. L., & Kotch, J. B. (2017). The within poverty differences in the occurrence of physical neglect. *Children and Youth Services Review, 75*, 1–6.
Shin, D., & Solon, G. (2011). Trends in men's earnings volatility: What does the panel study of income dynamics show? *Journal of Public Economics, 95*, 973–982.
Slack, K. S., Holl, J. L., Lee, B. J., McDaniel, M., Altenbernd, L., & Stevens, A. B. (2003). Child protective intervention in the context of welfare reform: The effects of work and welfare on maltreatment reports. *Journal of Policy Analysis and Management, 22*, 517–536.
Slack, K. S., Holl, J. L., McDaniel, M., Yoo, J., & Bolger, K. (2004). Understanding the risks of child neglect: An exploration of poverty and parenting characteristics. *Child Maltreatment, 9*, 395–408.
Suchman, N. E., Decoste, C., Leigh, D., & Borelli, J. (2010). Reflective functioning in mothers with drug use disorders: Implications for dyadic interactions with infants and toddlers. *Attachment & Human Development, 12*, 567–585.
Tach, L., & Edin, K. (2017). The social safety net after welfare reform: Recent developments and consequences for household dynamics. *Annual Review of Sociology, 43*, 541–561.
Trickett, P., Aber, L., Carlson, V., & Cicchetti, D. (1991). Relationship of socioeconomic status to the etiology and developmental sequelae of physical child abuse. *Developmental Psychology, 27*, 148–158.
UCLA Statistical Consulting Group. How can I compute indirect effects with imputed data? Retrieved from https://stats.idre.ucla.edu/stata/faq/how-can-i-compute-indirect-effects-with-imputed-data-method-2/.
Victor, B. G., Grogan-Kaylor, A., Ryan, J. P., Perron, B. E., & Gilbert, T. T. (2018). Domestic violence, parental substance misuse and the decision to substantiate child maltreatment. *Child Abuse & Neglect, 79*, 31–41.
Wagmiller, R. L., Lennon, M. C., Kuang, L., Alberti, P. M., & Aber, J. L. (2006). The dynamics of economic disadvantage and children's life changes. *American Sociological Review, 71*, 847–866.
Waldfogel, J. (2009). Prevention and the child protection system. *The Future of Children, 19*, 195–210.
Warren, E. J., & Font, S. A. (2015). Housing insecurity, maternal stress, and child maltreatment: An application of the family stress model. *Social Service Review, 89*, 9–39.
Wolf, S., & Morrissey, T. (2017). Economic instability, food insecurity, and child health in the wake of the Great Recession. *Social Service Review, 91*, 534–570.
Yeung, W. J., Linver, M. R., & Brooks-Gunn, J. (2002). How money matters for young children's development: Parental investment and family processes. *Child Development, 73*, 1861–1879.
Ziliak, J. P., Hardy, B., & Bollinger, C. (2011). Earnings and income volatility in America: Evidence from matched CPS. University of Kentucky Center for Poverty Research Discussion Paper Series, DP2010-05. Retrieved from http://www.ukcpr.org/Publications/DP2010-05.pdf.