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Children and Youth Services Review 118 (2020) 105502

Contents lists available at ScienceDirect

Children and Youth Services Review

journal homepage: www.elsevier.com/locate/childyouth

Household economic instability: Constructs, measurement, and implications

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ARTICLE INFO

Keywords:
Economic instability
Income
Employment
Hardship

ABSTRACT

A growing body of research demonstrates the multiple dimensions and dynamism of family income and employment. The metrics of household economic instability and their associations with household characteristics and hardship require further examination in order to compare across studies, subgroups, and historical periods. This paper empirically examines and compares commonly used measures of income and employment instability, how these measures inter-relate, vary by household characteristics, and how they predict household hardship. Using longitudinal data from the 2008 panel of the Survey of Income and Program Participation (SIPP), and focusing on households with children, this study examined a range of descriptive measures of economic instability, including in income, earnings, public assistance benefits, and employment status, and how these measures related to each other. Results indicate that overall rates of income and employment instability were high, particularly among less-educated families, those with young children, and those who did not own a home. Economic instability, particularly decreases in employment, was associated with increased household hardship three months later. Findings also show that the source of income included in the instability measure affects the patterns identified and conclusions drawn, whereas the specific type of measure used matters less. Results highlight the instability of public assistance benefits and suggest that safety net programs must take economic instability into account when designing programs and benefits.

1. Introduction

Household economic instability has increased in the past several decades, particularly during economic downturns such as the Great Recession (2007–2009) (Board of Governors, 2018; Mathematica Policy Research, 2018; Moffitt & Zhang, 2018). In the aftermath of the Great Recession, many children lived in households that experienced high levels of economic instability—defined here to include both income and employment instability—such that for some households, instability was nearly a "normative" event (Meadows, Sell, Blinkoff, Williams, & Repcheck, 2015; Wolf & Morrissey, 2017). While the recession caused instability and uncertainty for many (Kalleberg, 2009), income instability had been rising steadily among low-socioeconomic status (SES) families over the prior three decades, resulting in growing differences in experiences of income instability between low- and high-SES households (Ha, Thomas, Byrne, & Miller, 2020; Morris, Hill, Gennetian, Rodrigues, & Wolf, 2015; Wolf, Gennetian, Morris, & Hill, 2014; Wolf & Morrissey, 2017), as well as between White and Black households (Wrigley-Field & Seltzer, 2020). Further, since the 1990s, Black workers have been more likely to be displaced from their job compared to White workers (Wrigley-Field & Seltzer, 2020), suggesting widening racial gaps in employment instability. More recently, the COVID-19 pandemic has caused unprecedented economic instability and unpredictability for American families of color and those who were already falling behind (Board of Governors, 2020).

This widening "instability gap" may be one explanation for the growing health and achievement gaps observed between low- and high-SES adults and children (Crosnoe, Bonazzo, & Wu, 2015; Reardon, 2011). Unpredictable, frequent changes in resources, particularly in the context of poverty, contribute to stress and interfere with decision-making and other cognitive processes, resulting in cascading psychological effects (Gennetian & Shafir, 2015). A growing body of research indicates that, in addition to average resource levels, major income and employment changes, or "shocks," have short- and long-term implications for a range of negative health, educational, and economic outcomes for adults and children (Hardy, 2014; Hill, Morris, Gennetian,

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https://doi.org/10.1016/j.childyouth.2020.105502
Received 20 April 2020; Received in revised form 16 September 2020; Accepted 17 September 2020
Available online 22 September 2020
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Wolf, & Tubbs, 2013; Pryor, Strandberg-larsen, Andersen, & Hulvej, 2019; Wolf & Morrissey, 2017), including greater mortality (Pool et al., 2018).

Despite the growing research on the implications of economic instability for families and children (e.g., Hill et al., 2013; Jensen & Shore, 2015; Moffitt & Gottschalk, 2011; Moffitt & Zhang, 2018), the field lacks consistency in measures and definitions of economic instability and an understanding of what characteristics are most important when examining household economic changes. As economic instability has become a regular part of life for many American families (Board of Governors, 2020; Mathematica Policy Research, 2018) and this area of research grows, the metrics of economic instability need further examination. Without consistent measures, it is difficult for researchers or policymakers to make meaningful comparisons across studies, different subgroups or populations, or historical periods. Use of consistent measures can reveal underlying trends and help identify groups particularly impacted by economic instability. Understanding fluctuations in families' resources during the country's most recent recession, the Great Recession, can inform policymakers on how best to target resources during the COVID-19-induced economic downturn, which is likely to be more severe and potentially longer-lasting than the Great Recession. Focusing on households with children, we address three research questions:

1. How do two commonly used measures (arc percent change [APC] and percent change) and dimensions (e.g., earnings, employment, public assistance benefits) of economic instability inter-relate?
2. How are measures of economic instability associated with household characteristics?
3. How are measures of economic instability associated with measures of household hardship (e.g., food insecurity, difficulty paying bills)?

We first review recent literature on economic instability and its associations with household characteristics and outcomes. While not an exhaustive review of the literature, we pay particular attention to how economic instability is defined and measured and highlight several gaps in the existing research. We then conduct descriptive analyses of longitudinal, nationally representative data from 2008 to 2013 using the Survey of Income and Program Participation (SIPP), examining different measures and dimensions of economic instability, how they inter-relate to each other, how rates of economic instability vary across subpopulations, and how these measures of instability relate to several measures of hardship. These analyses are all the more important as the U.S. confronts the unprecedented COVID-19 pandemic and economic downturn. We conclude with recommendations for research and policy.

1.1. Defining economic instability

Studies assessing trends in economic instability over time have identified growing volatility for low- and middle-income households with children (Board of Governors, 2018; Mathematica Policy Research, 2018). These trends are particularly acute among low-income and low-educated workers and their families, and single-parent households (Morris et al., 2015; Western, Bloome, Sosnaud, & Tach, 2016), with serious consequences for the financial health of families. For example, in 2019, 88 percent of adults with a bachelor's degree reported that they were doing at least okay financially compared to 63 percent of adults with a high school degree or less. This 25-percentage point difference in financial well-being by education grew by 6 percentage points over the two years from 2017 to 2019 (Board of Governors, 2020).

With the growing research on economic instability comes growing variation in how instability is conceptualized and measured. Studies use different terms, definitions, and measures, making it difficult to compare findings or identify trends across time or subpopulations. For example, Wolf and Morrissey (2017) define economic instability as both income instability and employment instability, and operationalize these measures using percent and direction of change from month to month, whereas Hardy and Ziliak (2014) examine income volatility operationalized as the variance of the arc percent change (APC) in family income. In their review, Hill, Romich, Mattingly, Shamsuddin, and Wething (2017) define economic instability as "the repeated changes in employment, income, or financial well-being over time" as driven by changes in employment and earnings, family composition, and the receipt of public assistance benefits. Similarly, Western et al. (2016) discuss how often economic instability stems from adverse events such as job loss, family dissolution, and poor health.

The term *instability* may be used to describe any changes, positive or negative, in an individual's life or within a household, and its operational definition may vary by discipline or data availability – including what source of income is measured (e.g., individual or overall household earnings, non-earned income); the specific term used (e.g., volatility vs. instability); the frequency, predictability, and temporality of changes (e.g., yearly, weekly, monthly); how change is measured (e.g., the standard deviation of the arc percent change, the coefficient of variation, or the percent of income changed); and what magnitude or type of change constitutes a change substantial enough to be termed evidence of instability (Dynan, Elmendorf, & Sichel, 2012; Hardy & Ziliak, 2014; Hill et al., 2017; Moffitt & Gottschalk, 2012; Western et al., 2016).

1.2. The dimensions measured

First, *what* is measured–i.e., how income or employment is operationalized–varies across studies and datasets. Income is often used synonymously with earnings, and indeed, earnings account for the largest proportion of resources in the average household (Morduch & Schneider, 2017). However, among low-income households in particular, non-earned income such as public assistance benefits constitutes an important source of resources in the U.S. and other high-income countries (Avram, Brewer, Fisher, & Fumagalli, 2019). Safety net programs such as the Supplemental Nutrition Assistance Program (SNAP; formerly known as food stamps) and Temporary Assistance to Needy Families (TANF) are designed to provide temporary resources during periods of need (Hardy, 2017). Ideally, participation in these programs smooths household resource levels to prevent the negative effects of income losses. Similarly, other safety net programs such as Medicaid and child care subsidies provide substantial in-kind benefits, supporting health care access (Goodman-Bacon, 2016; Simon, Soni, & Cawley, 2017), financial security (Sommers, Gawande, & Baicker, 2017), and employment (Kaestner, Garrett, Chen, Gangopadhyaya, & Fleming, 2017; Morrissey, 2017).

Despite a large body of research on safety net programs, few studies include non-earned income in measures of income instability (Ha et al., 2020), and thus little is understood about how participation in such public programs affects household income patterns. For example, the vast majority of refunds from the Earned Income Tax Credit (EITC), a refundable tax credit designed to supplement workers' income, are distributed in the first quarter of the year (i.e., tax time) (Aladangady et al., 2018), and produce a once-a-year increase in income among participants. Likewise, public assistance programs can be burdensome to apply for and benefits are not always reliable or steady (Herd & Moynihan, 2018; Morduch & Schneider, 2017). Most safety net programs require participants to enroll and re-enroll, which may involve visits to a social welfare agency. Many households that drop off the enrollment rolls of public programs often remain eligible but fail to recertify, potentially due to administrative burden (Davis, Krafft, & Forry, 2017; Herd & Moynihan, 2018).

Of course, employment and income are typically intertwined, and thus job or labor force participation changes may result in substantial income changes. These changes often do not occur in isolation but are interconnected in complex ways. However, in their recent analysis of

data from the customers of a large bank, Morduch and Schneider (2017) found that while job changes caused swings in income, three-quarters of the income volatility in their sample was attributed to within-job fluctuations. Increasingly, the low-wage and less-educated workforce work variable hours from week to week (Board of Governors, 2018). Further, many households experiencing chronic income instability are stably employed (Morduch & Schneider, 2017), highlighting distinct (but interrelated) patterns. These distinct patterns of employment and income instability have unique associations with family and child outcomes (Wolf & Morrissey, 2017).

Studies vary on *whether* analyses or measures of economic instability include employment changes, and among studies that do, *how* employment instability is measured. It is relatively clear that job changes or job losses and entries into the workforce constitute employment changes, but other changes may (or may not) have similar consequences for family well-being. For example, how can changes in weekly work hours, schedules, and secondary or tertiary jobs be measured or incorporated into aspects of employment instability? Because public safety net programs are now more closely tied to employment or work-related activities than ever before (Loprest & Nightengale, 2018), public assistance may be less likely to smooth income or household resources during periods of employment instability, particularly during long periods of unemployment than found for previous historical contexts (Hardy, 2017).

1.3. How income change is measured

Several different approaches exist in the literature for assessing the magnitude of changes and providing thresholds for what is considered a change substantial enough to likely affect family functioning. Most simply, several studies have used the percent change in income compared to the prior assessment or average value, with varying thresholds or cut-offs to define income shocks, but largely clustered at 25 percent, 33 percent, or 50 percent (Miller & Votruba-Drzal, 2017; Morduch & Schneider, 2017; Prause, Dooley, & Huh, 2009; Wolf & Morrissey, 2017). Percent change measures are dependent on the baseline measure of income. This may be meaningful in that low-income households have tighter budget constraints, so smaller changes may be more impactful for daily life. On the other hand, larger values may not register as instability for moderate- or higher-income families, even though they affect family financial decisions, stress, or well-being.

Other studies have used cluster analysis to characterize groups of households experiencing high, medium, and low levels of instability, finding higher levels of problem behaviors for children in households with both low incomes and high levels of instability (Gennetian, Rodrigues, Hill, & Morris, 2018; Wolf et al., 2014), but not for children in middle-income households with high instability (Wolf et al., 2014), suggesting that the base level of income is important when measuring the effects of instability on families and children. Other studies have used the arc percent change (APC) or the standard deviation of the APC as measures of income instability (Gennetian et al., 2018; Hardy & Ziliak, 2014), which is less dependent on average income.

1.4. The characteristics of change measured

Theoretically, the direction, frequency, temporality, and predictability of changes can all have bearing on concurrent and later family well-being and present important questions for research (Hill et al., 2013). But how to measure each, and their theoretical relevance for family outcomes, is not well understood. The direction of change likely matters for its consequences—e.g., an increase or reduction in wages or employment differentially affect household resources and schedules—and some positive instability may have positive impacts on family well-being. However, some research finds that high levels of instability, whether positive or negative, are associated with poorer child outcomes, particularly behavior in adolescence (Gennetian, Wolf, Hill, & Morris, 2015). While a positive income change could increase household resources, it may be a result of caregivers taking on additional shifts or work hours, which could reduce parent–child time and lead to unpredictable resources and schedules in the household (Gennetian et al., 2015; Li et al., 2014; Prickett, 2018). Further, instability can be characterized as *episodic* or *chronic*. Episodic instability refers to discrete, acute "shocks" such as a job loss, whereas chronic instability refers to a sustained pattern of acute events, such as variable earnings due to seasonal or shifting work schedules. It is not yet known whether large changes are more consequential for family well-being than frequent, smaller changes in income or employment, or how the predictability of change relates to family outcomes. Some of this can be attributed to data limitations, as only a handful of nationally representative datasets (e.g., the Survey of Income and Program Participation [SIPP]) can be used to examine intra-year changes in income or employment.

1.5. Household factors associated with economic instability

Evidence suggests that the experience of economic instability is more prevalent among certain groups of households, particularly those disadvantaged by some measure. For example, during the Great Recession, seven in ten preschool-age children whose parents had less than a high school degree experienced a change in household income (of 33 percent or more) or parental employment status in any given year (Wolf & Morrissey, 2017). Instability is also higher in single-parent households (Leete & Bania, 2010) and households with younger children (Hernandez & Napierala, 2017). Importantly, the early childhood period is one in which families with young children face a multitude of expenses, from health care to child care, and are typically at the lowest earning years of parents careers (Traub, Hiltonsmith, & Draut, 2016).

1.6. Economic instability and family well-being

Unpredictable, frequent, or dramatic swings in household resources interfere with the ability meet or plan for basic or future needs, contributing to stress and other negative outcomes. For example, involuntary job loss has been associated with lower maternal sensitivity to children, particularly among less-educated mothers (Prickett, 2020). Job loss typically results in household budget constraints (Gundersen & Gruber, 2001) and increases the likelihood of food insecurity (Jacknowitz, Morrissey, & Brannegan, 2015; Leete & Bania, 2010). Families who experience sharp decreases in income may change their spending habits (Mills & Amick, 2010; Yeung & Hofferth, 1998) and have trouble paying bills (Mills & Amick, 2010). Households with few assets and resources are more likely to cut food expenditures following a substantial loss in income or job change (Yeung & Hofferth, 1998), whereas those with assets such as savings accounts or who own their homes are more often able to buffer the negative impacts of income loss (Mckernan, Ratcliffe, & Vinopal, 2009). Income volatility has been associated with poorer adult mental health, depression, and parenting quality (Catalano et al., 2011; Prause et al., 2009; Solantaus, Leinonen, & Punamaki, 2004), and even higher mortality (Pool et al., 2018).

Changes in household resources and dynamics are likely to affect child and adolescent well-being (Gennetian et al., 2015, 2018; Wolf & Morrissey, 2017). Income instability is linked to poorer educational and behavioral outcomes for children, and even intergenerational impacts (Hardy, 2014; Morris et al., 2015). Independent of changes in household income, employment instability has been linked with poorer outcomes at both the individual and community levels (Ananat, Gassman-Pines, Francis, & Gibson-Davis, 2017; Kalil & Wightman, 2011). Child health is adversely associated with economic instability (Solantaus et al., 2004), particularly among the children of parents with low education levels (Wolf & Morrissey, 2017). Research finds that exits from public assistance programs (and presumably the sharp decrease in household resources from fewer public benefits) are associated with

poorer health among preschool-aged children in immigrant families (Kalil & Crosby, 2010). Notably, the nature of economic instability, and its co-occurrence with other phenomenon such as housing mobility, hardship, and family instability, present challenges in drawing causal associations.

Despite growing research, many questions remain. Evidence suggests that the effects of economic hardship on child well-being may depend on *when* economic hardship occurs relative to a child's developmental stage (Duncan, Ziol-Guest, & Kalil, 2010), but it is not understood how instability at different ages and stages may differentially relate to children's outcomes. Further, research highlights the negative effects of persistent poverty for children's development (McLoyd, 1998; Ratcliffe & Kalish, 2017), but little research has compared how the experiences of persistent instability in household resources affect children and adults. One recent study using Norwegian data found that intermittent poverty, but not chronic poverty, was associated with child psychological difficulties after controlling for early risk factors (Pryor et al., 2019). Less frequently studied is how positive income shocks affect family well-being—whether beneficial or problematic, as a source of stability—or how the experiences of households with unstable resources compare to those of stable but low-income households. Finally, given the lack of consistency in measures (e.g., percent change in income, APC) or the types of domains included (e.g., some studies use earnings alone), the field lacks an understanding of what definitions or measures may best represent consequential experiences of instability.

2. The current study

The growing body of research investigating patterns of economic instability and its implications for families and children uses a variety of measures, definitions, and datasets. Given the documented trends on the rise, coupled with the negative consequences of instability for children and parents, we use nationally representative, longitudinal data from the 2008 panel of the Survey of Income and Program Participation (SIPP) to: test different measures and domains of economic instability, including various types of and changes in income and employment; examine how these measures inter-relate; describe how these measures vary across select household characteristics; and assess how measures of household hardship are associated with economic instability.

3. Methods

3.1. Data

The 2008 panel of the SIPP was collected from 2008 to 2013 by the U.S. Census Bureau. The 2008 SIPP collected monthly household economic information and periodic information on household characteristics, such as household composition and health insurance coverage, on a nationally representative sample of households over several years. The SIPP is uniquely suited for our purposes as it is one of only a few nationally representative datasets that captures intra-year income changes.[1] Our unit of analysis is households, which were surveyed from September 2008 through December 2013 in the sixteen waves of data collected in this survey. During each wave of data collection (every 4 months), the SIPP asked participants to share their personal information pertaining to the month of the interview and for each of the three months prior. The initial survey sample size of the SIPP was roughly 400,000 household-months per wave (approximately 42,000 households followed over time). As with all longitudinal datasets, there were missing data, both due to attrition and to households being unavailable at certain waves. There were 88,761 month-records for 14,433 households representing September to December 2008, followed by a high of 142,348 records for 15,135 households in 2009 and declines in the number of records and households since then, all the way down to 43,710 records for 8,664 households in 2013.

We collapsed this data into a household-month level data set containing both household-level information (ex., total household income instability) and person-level characteristics for household members (ex. reference person's employment status) for each month. Our final analytic sample consisted of 621,015 household-months for 24,083 households with at least one child under the age of 18.[2] We excluded wave 16 (households surveyed from September to December 2013) because there is no data for Rotation 2 due to the government shutdown in October 2013. We used all monthly economic data available in the SIPP, providing us with monthly household income and employment information up to 12 times per year, and up to 60 months (i.e., time points) per household, beginning in May 2008 and ending in July 2013.[3] All analyses are weighted at the household-level and thus can be generalized to U.S. households with one or more children.[4]

3.2. Measures

3.2.1. Household income and income changes

Average monthly income in the SIPP is a composite variable computed by the U.S. Census Bureau that sums the reported pre-tax income of everyone in the household. This includes earned income, cash transfer payments (i.e., benefits from means-tested programs including cash values of SNAP), lump-sum and one-time payments, regular salary or other income from self-owned business, property income, and any interest and dividend income (Westat, 2007). Importantly, the measure assesses pre-tax or gross income, and does not include tax refunds. It is collected at each wave (every 4 months) and reported for each of the previous four months. In our analyses, we distinguish between the source of income: the respondent's individual earnings; his or her spouse's earnings; his or her cohabitating partner's earnings; total household earnings; non-earned household income; and total household income. In analyses, we differentiate between married and cohabitating partnerships because these households may share or distribute income resources differently. The SIPP also provides monthly measures of participation in various types of public assistance, four of which we use in this paper. We define public assistance income as the total household benefits received from public assistance programs including TANF, SNAP (voucher amounts), and Supplemental Security Income (SSI). We also include Social Security benefits within the public assistance programs category, although Social Security benefits are linked to contributions and are not means tested.

We defined income instability in two ways. First, we created a measure of percent change in income across consecutive months. A *positive income change* (an increase in income from one month to the

[1] The Panel Study of Income Dynamics (PSID) and the Current Population Survey (CPS), the latter of which is predominantly cross-sectional with limited well-being measures, are the other two nationally representative datasets known to the authors that can be used to examine intra-year income changes.

[2] We compared the demographic characteristics of our analytic sample and dropped cases, i.e., households with no children and households with no adults. Compared to dropped cases, our sample included higher proportions of households with female and nonwhite reference persons. These households were also more likely to contain spouses and cohabiting partners, in addition to having higher average incomes. Minimal differences existed in terms of highest level of education attained by the reference person.

[3] Note that we conducted a series of sensitivity analyses that kept only the interviewees' fourth reference month (the interview month), to address seam bias and recall bias concerns. Results follow similar patterns to our main models (results are available upon request).

[4] Household weights were used to approximate population estimates for all analyses. The SIPP longitudinal codebook and exchanges with the Census/SIPP support confirmed that SIPP longitudinal weights are limited to person-level weights.

Table 1
Descriptive Statistics of Measures of Earnings Instability and Total Income Instability.

Summary Statistics of Measures of Instability

	N	Mean	Median	SD
Percent Change in Earned Household Income	590,173	3.22	0.00	34.83
Percent Change in Reference Persons' Earned Household Income	590,170	2.86	0.00	35.08
Percent Change in Spouses' Earned Household Income	405,008	2.65	0.00	33.80
Percent Change in Cohabiting Partners' Earned Household Income	33,434	3.67	0.00	38.68
Percent Change in Total Household Income	590,173	3.19	0.00	33.21
APC in Earned Household Income	590,171	0.12	0.00	36.89
APC in Reference Persons' Earned Household Income	590,170	0.13	0.00	40.00
APC in Spouses' Earned Household Income	405,008	0.10	0.00	38.53
APC in Cohabiting Partners' Earned Household Income	33,433	0.39	0.00	44.48
APC in Total Household Income	590,173	0.16	0.00	32.73

Bivariate Correlations Among Measures of Instability

	% Change Earned HH Inc	% Change Ref Per Earned HH Inc	% Change Total HH Inc	APC Earned HH Inc	APC Ref Per HH Inc	APC Total HH Inc
Percent Change in Earned Household Income	1.00					
Percent Change in Reference Persons' Earned Household Income	0.64	1.00				
Percent Change in Total Household Income	0.85	0.57	1.00			
APC in Earned Household Income	0.90	0.59	0.75	1.00		
APC in Reference Persons' Earned Household Income	0.59	0.90	0.52	0.64	1.00	
APC in Total Household Income	0.76	0.52	0.89	0.82	0.55	1.00

Note: Household weights used to approximate population estimates. All correlations statistically significant at $p < .001$ level.

next) is indicated by values greater than zero, and a *negative income change* (a decrease in income from one month to the next) is indicated by negative values. Second, we calculated the monthly arc percent change (APC). Following previous research (Hardy, 2017; Hill, 2017), monthly APC was calculated for each month of the survey using the following:

$$APC = 100^{*}(Y_t - Y_t - 1)/((Y_t + Y_{t-1})/2) \quad (1)$$

where Y is household income and t represents months of data. Both income percent changes and APC were bounded by −200 and 200, with higher absolute values indicating greater instability.

3.2.2. Household employment and employment changes

Employment status was a self-reported variable for the child's primary parent and their married spouse or cohabiting partner, defined as the average number of hours worked per week at all jobs in the previous month. Employment status was coded for both the reference person and his/her spouse or cohabitating partner at each wave. Thus, both our income and employment instability measures capture the economic activities of one or both adults in the household. Responses were categorized into three categories: full-time employed (worked 35 weekly hours or more throughout the month), part-time employed (worked fewer than 35 weekly hours throughout the month, or 35 or more hours for only part of the month), and unemployed (did not work/did not have a job, or was absent without pay from a job all weeks in the previous month).

Changes in employment status were computed for all primary or secondary jobs, and we distinguish between inclines (e.g., moving from unemployed to full- or part-time) and declines in employment (e.g., moving from full- to part-time). Changes in employment included voluntary and involuntary changes in hours and status. We considered changes in employment for each month of the survey using a binary indicator of whether respondents experienced an incline (e.g., more hours, or from part- to full-time employment) or decline (e.g., fewer hours, from part-time to no employment) in employment status compared to the previous month.

3.2.3. Household characteristics and hardship

Household characteristics examined in relation to measures of economic instability included: parent educational attainment *(less than high school; high school degree; some college or more*); home ownership; and age of the youngest child in the household (*0–5 years; 6–12 years; 13–18 years*), all as reported by survey respondents.

We examined various measures of household-level hardship, which are available in the SIPP's adult well-being topical modules offered in waves 6 and 9. Our definition of hardship is comprised of six binary indicators representing affirmative responses to six items regarding recent household experiences: food insecurity (representing affirmative response to one or more of the six food insecurity questions in the SIPP regarding the prior 4 months); children not eating enough in the prior 4 months; eviction from house or apartment in the prior 12 months; not paying gas, oil, or electricity bills in the prior 12 months; not paying for rent or mortgage in the prior 12 months; and not going to see dentist or doctor when needed in the prior 12 months.

3.3. Analyses

We first present a series of descriptive analyses, including frequencies, means, standard deviations (SDs), and medians, to examine rates of economic instability among families with children. Second, we used bivariate correlations to compare how the multiple measures and dimensions of economic instability inter-relate and are associated with household characteristics and measures of hardship.

4. Results

4.1. RQ1. How do measures and dimensions of economic instability Inter-Relate?

The first panel of Table 1 displays the means, standard deviations, and median values for each of our measures of income and public assistance instability for monthly measures from May 2008 to July 2013 (in 2013 $). As shown, the medians for all measures are 0, indicating that most families did not experience month-to-month changes in income or public assistance resources. However, the means and standard deviations for the percent change in income across all categories of income were quite high, indicative of the variation in the sample. Notably, all of the mean percent changes across types of income were

positive, consistent with the time period of the data starting during the Great Recession and lasting through the slow recovery. For example, during an average month, households with children experienced a 3.2 percent change in earned income from the previous month. The earnings of cohabitating partners showed the greatest instability, averaging a change of 3.7 percent, with a high standard deviation (38.7), while spouses' earnings showed the lowest levels of instability, highlighting the importance of family structure to household resource stability. Also notable is that the patterns across the percent change measures and the APC measures of income instability were very similar. Surprisingly, total household income was not consistently more stable than earnings, in contrast to research in the U.K. (Avram et al., 2019), which may reflect that public assistance sources are included in the total income measure.

The second panel of Table 1 shows the correlations among these income instability measures, which were positive and relatively high among the percent change and APC measures. For example, the correlation between the percent change in total household income and APC in total household income was 0.89, suggesting that these two measures capture different but highly related dimensions of instability, despite the APC being independent of average income. Within type of instability measure, however, the sources of income were only moderately correlated with each other (e.g., the correlation between percent change in earned household income and the percent change in the reference person's income was only 0.64). Thus, what is being measured—i.e., income source—appears to matter to the patterns identified and conclusions drawn, whereas the type of measure used matters less.

Table 2 shows descriptive statistics for the percent change and APC measures of instability in public benefits, namely in public cash assistance (which consists of predominantly TANF), SNAP, Social Security, and SSI. As with earnings, the average percent change and APC measures from month to month were quite low, and the median was 0 (largely reflecting that most of our sample were "stable 0's" in that they consistently did not participate in these programs month-to-month; e.g., nearly 97–98 percent of sample households reported zero SNAP changes). On average, SNAP beneficiaries showed a 1.1 percent increase in SNAP benefits, higher than the very low average percent changes for public assistance (i.e., TANF), SSI, or SSDI, which may reflect SNAP benefits levels' reliance on earnings and household composition as well the 2009 ARRA temporary eligibility expansion and increase in SNAP benefits averaged over time. The SDs for measures of SNAP benefits instability were relatively high, however, suggesting that these means are driven by a few outlier households experiencing quite high levels of monthly changes in benefits—likely those entering and exiting the program. These results suggest that public assistance programs provide relatively stable sources of household resources, with some exceptions. Importantly, though, many of these benefits, particularly TANF, are only received by a fraction of those eligible, and benefit levels are generally low in total value (Floyd, Burnside, & Schott, 2018). Further, these descriptive statistics are averaged across our entire sample, which is representative of U.S. households with one or more children under the age of 18.

Table 2
Descriptive Statistics of Measures of Public Assistance Instability.

	N	Mean	Median	SD
Percent Change in Household Public Assistance	590,173	0.20	0.00	9.84
Percent Change in Household SNAP	590,173	1.12	0.00	19.75
Percent Change in Household Social Security Income	590,173	0.52	0.00	13.55
Percent Change in Household Supplemental Security Income	590,173	0.34	0.00	11.18
APC in Household Public Assistance	590,173	−0.01	0.00	12.05
APC in Household SNAP	590,173	0.35	0.00	22.45
APC in Household Social Security Income	590,173	0.17	0.00	15.50
APC in Household Supplemental Security Income	590,173	0.09	0.00	13.01

Note: Household weights used to approximate population estimates.

Table 3
Descriptive Statistics of Measures *of Employment Instability.*

	N	Mean	Median	SD
Reference persons' usual hours worked per week	620,953	31.05	40.00	19.56
Reference persons' decrease in employment	590,110	0.01	0.00	0.11
Reference persons' increase in employment	590,110	0.01	0.00	0.11
Spouses' usual hours worked per week	424,780	30.98	40.00	20.11
Spouses' decrease in employment	404,900	0.01	0.00	0.11
Spouses' increase in employment	404,900	0.01	0.00	0.11
Cohabiting partners' usual hours worked per week	36,052	26.45	37.00	19.85
Cohabiting partners' decrease in employment	33,434	0.02	0.00	0.13
Cohabiting partners' increase in employment	33,434	0.02	0.00	0.13

Note: Household weights used to approximate population estimates. Increase/decrease in employment defined as changes between full-time employment (worked 35 weekly hours or more throughout the month), part time employment (worked fewer than 35 weekly hours throughout the month, or 35 or more hours for only part of the month), and unemployment (did not work/did not have a job, or was absent without pay from a job all weeks in the previous month). The means for increases/decreases in employment may be interpreted as the proportion of the household month sample in which the reference person/spouse/cohabiting partner experienced changes in employment.

Table 3 shows descriptive statistics for employment instability, defined as changes in the hours worked for the reference person, and when present, his/her spouse or cohabitating partner. On average, both the reference person (survey respondent) and spouse worked an average of 31 hours per week, and cohabitating partners worked 26 hours per week, with medians at 40, 40, and 37 hours per week, respectively, for these groups. Month-to-month inclines and declines in employment status were relatively similar across different members of the household, meaning that of the approximately 620,000 household-months in our sample, about 1 percent experienced some decline in their employment status, and 1 percent experienced an incline. Like income, cohabitating partners' employment status showed slightly greater levels of instability than spousal or respondent employment status.

Because the percent change and APC measures are highly correlated, we use APC measures of income sources for the remainder of the paper. Table 4 shows the bivariate correlations among total income (APC), earnings (APC), public assistance (APC), and employment instability. Instability in the various types of income was correlated with each other (earnings and total household earnings and income, 0.55–0.82), and instability in the reference person's employment status was weakly correlated with instability in the reference person's earnings (0.13 to −0.12). In general, however, correlations between income instability, public assistance instability, and employment instability were very weak or near zero, suggesting that from month to month changes in these constructs happen somewhat independently. Interestingly, instability in SNAP benefits were largely uncorrelated with instability in income or employment, somewhat surprising given that SNAP benefits are adjusted with household income changes. This may be due to a lag in SNAP receipt, which would presumably come following an income loss and applying for benefits.

4.2. RQ2. How do measures of economic instability vary with household characteristics?

Table 5 shows measures of economic instability by the highest level of educational attainment in the household. Consistent with previous research (e.g., Wolf & Morrissey, 2017), less-educated households experienced greater average levels of economic instability compared to

Table 4
Bivariate Correlations of APC Earnings, APC Public Assistance, and Employment Instability Measure.

	APC Earned HH Inc	APC Ref Per Earned HH Inc	APC Total HH Inc	APC HH Pub Ass	APC HH SNAP	APC HH Social Sec Inc	APC HH Supp Sec Inc	Ref Per Emp Decrease	Ref Per Emp Increase
APC in Earned Household Income	1.00								
APC in Reference Persons' Earned Household Income	0.64***	1.00							
APC in Total Household Income	0.82***	0.55***	1.00						
APC in Household Public Assistance	−0.01***	−0.01***	0.08***	1.00					
APC in Household SNAP	−0.01***	−0.02***	0.00	0.08***	1.00				
APC in Household Social Security Income	0.00	0.00**	0.09***	0.01***	0.01***	1.00			
APC in Household Supplemental Security Income	0.00**	0.00	0.07***	0.01***	0.01***	−0.02***	1.00		
Reference persons' decrease in employment (all hours worked per week)	−0.07***	−0.12***	−0.05***	0.01***	0.03***	0.01***	0.01***	1.00	
Reference persons' increase in employment (all hours worked per week)	0.08***	0.13***	0.07***	0.00	0.01***	0.00*	0.00	−0.01***	1.00

*Note: * $p < .05$. ** $p < .01$. *** $p < .001$. Household weights used to approximate population estimates. Increase/decrease in employment defined as changes between full-time employment (worked 35 weekly hours or more throughout the month), part time employment (worked fewer than 35 weekly hours throughout the month, or 35 or more hours for only part of the month), and unemployment (did not work/did not have a job, or was absent without pay from a job all weeks in the previous month).*

those with at least some college, particularly in employment. In a given month, two percent of households with a high school degree or less experienced a decline in employment status, and an additional two percent experienced an incline, compared to one percent of those with some college or more for each inclines and declines. Income instability differences were largely non-significant by educational attainment with one exception. Not surprisingly given the program's income eligibility requirements, APC measures for SNAP were significantly higher among the least educated, and those with some college or more were more likely to consistently not participate in SNAP. One reason for the lack of differences in instability for Social Security benefits is its universality and its detachment from assets, as benefits are based on prior contributions and not means-tested to concurrent resources, unlike other public programs. Notably, however, APC in the reference person's income was negative for those lacking a high school degree, suggesting that during our time period, this group lost income.

As shown in the second panel of Table 5, home ownership was a powerful predictor of instability in employment, total income, and in SNAP and SSI benefits. In our sample, households that did not own a home had total incomes that were nine times as unstable, and experienced double the number of job inclines as declines, as those who owned their homes. As expected, levels of household income instability varied with the age of the youngest child, displayed in the third panel of Table 5. In general, households with young children (under age 6) showed higher levels of income instability, particularly in earnings and total income. This is consistent with prior research demonstrating the swings in income for new parents in particular (Stanczyk, 2016), often driven by changes in work hours (Laughlin, 2011). The APC in SNAP was significantly higher among households with young children. In contrast, this was not the case for Social Security or SSI benefits, neither of which necessarily vary with the age or number of children in the home. Employment instability appeared relatively consistent across households by child age, but both rates of inclines and declines were significantly higher for those with children under the age of five. This was expected given that parents, particularly mothers, are more likely to break from the labor force when children are very young and re-enter the workforce as their children age.

4.3. RQ3. How are measures of economic instability associated with household hardship?

Frequencies for measures of hardship, assessed twice during the panel, indicate that substantial proportions of households had experienced hardship in the prior 12 months. Seventeen percent of the sample reported food insecurity, and 6.6 percent reported their children were not eating enough. Less than 1 percent of the sample had been evicted from their house or apartment in the last year, but 11.8 percent reported not paying rent or mortgage, consistent with research showing housing insecurity to be a common problem (Desmond, 2016; Warren & Font, 2015). Fifteen percent reported not paying gas, oil, or electricity bills, and 9.1 and 11.7 percent reported not seeing the doctor or dentist when needed, respectively.

Because economic changes likely have delayed associations with hardship, we tested bivariate correlations between measures of economic instability and lagged measures of hardship between the two survey waves (waves 6 and 9). Results are shown in Table 6. Associations between income instability and hardship were small overall, but the magnitude of correlations with the lagged measures was larger, such that measures of instability were more strongly associated with hardship three months later compared to one or two months following the experience of instability. For example, employment changes—both inclines and declines in employment—were associated with greater food insecurity, children's food insecurity, not paying utility bills, not paying the rent or mortgage, and not seeing a dentist or doctor when needed, with r ranging from 0.01 to 0.06. These results suggest that changes in employment, whether positive or negative, may contribute

Table 5
Means of Instability Measures by Highest Educational Attainment, Home Ownership, and Age of Youngest Child.

	Highest Educational Attainment			Home Ownership		Age of Youngest Child		
	Less than High School	High School Degree	Some College or Higher	Does Not Own Home	Owns Home	0–5 Years	6–12 Years	13–18 Years
Earned Income APC	0.01	0.14	0.13	0.22	0.07	0.25	−0.06**	0.13
Ref Person's Earned Income APC	−0.11	0.14	0.17	0.21	0.09	0.26	0.07+	−0.02*
Total Income APC	0.09	0.22	0.14	0.32**	0.07	0.28	0.02**	0.15
Public Assistance APC	−0.05	0.02	−0.02	−0.01	−0.01	−0.02	0.02	−0.04
SNAP APC	0.77***	0.50***	0.21	0.67***	0.18	0.54	0.24***	0.16***
Social Security Income APC	0.21	0.23*	0.13	0.23*	0.14	0.11	0.19+	0.25**
Supplemental Security Income APC	0.20*	0.13*	0.05	0.15*	0.06	0.09	0.08	0.12
Decrease in Employment Status	0.02***	0.01***	0.01	0.02***	0.01	0.01	0.01***	0.01***
Increase in Employment Status	0.02***	0.02***	0.01	0.02***	0.01	0.01	0.01**	0.01***

*Note: +$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$. Household weights used to approximate population estimates. Tests of statistical significance based on simple OLS and logistic regression models using only highest educational attainment (reference category: Some College or Higher), home ownership (reference category: Owns Home), and age of youngest child (reference category: 0–5 Years), to predict each measure of instability.*

to increases in hardship. These findings provide evidence that household economic change itself—not simply the direction of change—may be important for family well-being, and, further, that employment changes may have delayed associations with measures of household hardship.

5. Discussion

This study descriptively examined household income and employment instability, their inter-relatedness, and their associations with household characteristics and financial and material hardship. We considered a range of commonly used measures in the economic instability literature, and examined income instability for a variety of income sources that are rarely disaggregated. Consistent with the growing literature on economic instability in the United States and abroad (Avram et al., 2019; Board of Governors, 2018; Hardy & Ziliak, 2014) and the timing of our data, which were collected during the Great Recession and the initial recovery following (Finnigan, 2018), there were high levels of economic instability among households with children, and multiple dimensions and measures of economic instability varied with household characteristics and hardship (Hill et al., 2013; Wolf & Morrissey, 2017). Our study adds to this literature, finding that measures used for income instability—here, month-to-month percent change and APC—showed similar patterns. Conversely, instability patterns differed based on the specific type of income included (e.g., earnings, public assistance, total household). In particular, we found that public assistance income—particularly in SNAP benefits, one of the primary safety net programs in the U.S.—had high levels of instability during a period of economic downturn and subsequent recovery during which increasing numbers of families relied on the program (Hardy, Smeeding, & Ziliak, 2018; Nord & Prell, 2011). These findings are all the more relevant as the world enters another more severe economic downturn given the COVID-19 pandemic.

In an average month over the span of our study, from 2008 to 2013, households with children experienced a 3.2 percent change in total household income, though this overall mean masks variation by household characteristics. Instability in total income was much lower for families that owned their own homes, and for families with school-age children compared to those with young children. Home ownership, usually the most valuable asset a family has, may buffer against the negative effects of instability (Acs & Nichols, 2010; Mckernan et al., 2009), and has become more important in the context of rising housing costs. Since 1995, the median asking rent has soared by 70 percent, while incomes have remained flat (Desmond, 2016). Most low-income families spend more than half of their income on housing and constantly face the threat of eviction. However, several public programs have asset limits (e.g., in many states SNAP benefits are only available to families with assets below a certain amount) (Ratcliffe, Mckernan, Wheaton, & Kalish, 2016). Asset limits may discourage savings, which can be detrimental for the financial security of families (Chen & Lerman, 2005). Further, the historical context of our analysis was one of unprecedented foreclosure rates, also shown to have negative effects on health (Currie & Tekin, 2015). It is possible that in our study, home ownership served as an indicator of better economic and overall well-being as well as a measure of assets. Moreover, several measures indicated that income and employment were more volatile among households with young children compared to those with school-age children, consistent with income dynamics surrounding the birth of a child (Stanczyk, 2016) and that paid family leave is relatively uncommon in the U.S. (Laughlin, 2011). Given the developmental importance of the early childhood period, the high rates of instability during the early years are troubling.

Of particular concern to policymakers and scholars are the findings of high instability levels in public assistance benefits, particularly for SNAP benefits, among households with children. These instability levels were higher for less-educated households and households not owning their homes. There was a dramatic increase in SNAP enrollment and an expansion in benefits and eligibility parameters during this period (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2015). Public assistance benefits (predominantly TANF) showed the greatest stability, although in most states, absolute TANF benefits are quite low. In 2016, the average monthly benefit across the 50 states and the District of Columbia was $521 for a family of three (UKCPR, 2018). More research is needed to better understand these fluctuations in benefits and their drivers, and how policies can be better designed to smooth periods of instability.

Results highlight the volatility and vulnerability in employment faced by many American households. Each month, between one and two percent of households with children in the country experienced a member entering or exiting the workforce, with rates higher in cohabitating households. Employment instability was more common among less-educated households, households with young children, and households that did not own their homes. Research has established connections between family and community job loss and negative parent and child outcomes (Ananat et al., 2017), which are consistent with our findings that job changes (both entries and exits from employment) are associated with increased reports of food insecurity, unpaid bills, and problems accessing health care. Further, about half of the U.S. population relies on their own or a family member's employer for health insurance, such that job losses are compounded in the current public health crisis. With more than 8 million individuals applying for unemployment benefits in March 2020 alone, instability in work status

Table 6
Bivariate Correlations Between Measures of Economic and Public Assistance Instability and Lagged Measures of Household Hardship.

	Food Insecurity	Children Not Eating Enough	Evicted from House/ Apt	Did not pay gas, oil, or electric bills	Did not pay rent or mortgage	Did not see dentist when needed	Did not see doctor when needed
1 Month Prior APC in Earned Household Income	0.01	0.00	0.00	0.01	0.01	0.01	0.00
2 Month Prior APC in Earned Household Income	0.00	0.00	0.00	0.00	−0.01	0.01	0.01
3 Month Prior APC in Earned Household Income	−0.01	−0.03***	0.02*	0.00	0.01	−0.01	−0.01
1 Month Prior APC in Reference Persons' Earned Household Income	0.01+	0.00	0.01	0.01+	0.01	0.01	0.00
2 Month Prior APC in Reference Persons' Earned Household Income	0.01	0.00	0.00	0.00	0.00	0.01*	0.01
3 Month Prior APC in Reference Persons' Earned Household Income	−0.01	−0.02*	0.02*	0.00	0.00	−0.02**	−0.01+
1 Month Prior APC in Total Household Income	0.00	−0.01	0.01	0.00	0.01	0.00	−0.01
2 Month Prior APC in Total Household Income	−0.01	0.00	0.00	−0.01	−0.03***	0.00	0.00
3 Month Prior APC in Total Household Income	0.00	−0.02*	0.01+	0.00	0.00	0.00	0.00
1 Month Prior Reference persons' decrease in employment	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2 Month Prior Reference persons' decrease in employment	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 Month Prior Reference persons' decrease in employment	0.04***	0.03***	0.00	0.04***	0.05***	0.05***	0.03***
1 Month Prior Reference persons' increase in employment	0.03***	0.00	0.00	0.02**	0.00	0.01	0.01*
2 Month Prior Reference persons' increase in employment	−0.01	0.00	0.00	0.00	0.00	0.00	0.01
3 Month Prior Reference persons' increase in employment	0.04***	0.01	0.01+	0.04***	0.06***	0.04***	0.04***

*Notes: + $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$. Household weights used to approximate population estimates. Sample restricted to 4th reference months in waves 6 and 9 (adult well-being topical modules). Food insecurity measure was created by aggregating five food insecurity questions in SIPP (eafless, eafbaln, eafskip, eafdm1-5, eafday). Questions about food insecurity were based on a 4 month reference period, while the other questions were asked based on the previous 12 months.*

is a vital component to be included in measures of family resources to better understand how economic downturns affect short- and long-term health and well-being.

These findings have numerous policy and research implications, particularly during the current pandemic and its economic fallout. Policies that may promote stability in (and predictability of) household resources include less burdensome program recertification of eligibility process, longer recertification periods, or continuous eligibility policies. In general, these policies make benefits consistent, even during periods of short-term income or employment fluctuations, and thus stabilize household resources (Romich & Hill, 2018). For example, previous research showing that most families exiting the child care subsidy system remain eligible (Grobe, Weber, & Davis, 2008; Ha, Magnuson, & Ybarra, 2012; Ha & Meyer, 2010) led to a requirement that state subsidy programs use a minimum 12-month continuous eligibility period to enhance stability. Our findings also offer indicators of what types of households may be most at risk for economic instability such as those with young children or with few assets. However, future research that can shed additional light on priorities or strategies for policymakers is hampered by the lack of data, particularly data that are longitudinal and nationally representative, which can be used to examine intra-year changes in income and employment. Most importantly, our findings indicate that the specific source of or the definition of economic instability (e.g., earnings, public assistance benefits, employment hours), rather than the specific type of measure (e.g., APC, percent change), relates to the patterns identified and conclusions drawn. Studies that use different measures but the same or similar sources of economic instability may be somewhat comparable, allowing for more conclusions to be drawn regarding time trends, subgroup comparisons, and other issues vital to the study of economic instability.

Despite its strengths, including the use of monthly, longitudinal, nationally representative data, this study has limitations. First, the study is descriptive in nature. We examined unadjusted bivariate correlations between instability and later hardship, which were relatively small and cannot be interpreted as causal. Notably, the pattern of results are consistent with prior research (Pryor et al., 2019). Second, seam bias in the SIPP may lead to less accurate reporting of income during the non-reference months, which may inflate or underestimate our measures of income instability (Moore, 2007). To address these recall bias concerns, we re-ran our analyses after keeping only the interviewees' fourth reference month (the interview month), finding substantively similar patterns (results are available upon request). Third, this study does not capture receipt of private cash assistance that could smooth income volatility (Pilkauskas, Campbell, & Wimer, 2017), which may help explain the small correlations between economic instability and hardship. This study also examined a period of economic downturn and recovery, and our patterns may not generalize to other historical contexts. Finally, several of our analyses rely on the APC, which has advantages and limitations. For example, the APC is less reliant on average income and is a measure of magnitude and direction of change, but the APC assumes that the gains and losses in income can be treated symmetrically. Further, although zero earnings can be included in an APC measure, the measure assumes that households have non-zero earnings in at least one year. In addition, using the variance of the log earnings as a measure of income instability entails dropping individuals with zero earnings, presumably underestimating income instability (Ziliak, Hardy, & Bollinger, 2011). This means that the APC may not capture instability among very low-income households, in particular. However, APC measures of income instability are highly correlated with measures that are meaningful to household resources like percent change in income, as well as hardship three months later, but are less reliant on average or base income levels. Importantly, however, we did not test all possible measures of income instability, which could include coefficients of variation or number of months with stable earnings. Future research would benefit from an exhaustive review of the measures used to assess income instability to inform related research.

6. Conclusion

This descriptive study advances the growing body of research on economic instability, comparing and contrasting measures across the various dimensions of income and employment instability. We examined how these measures of economic instability varied with household characteristics and hardship. Our findings highlight the prevalence of economic instability among American households with children, the connections between economic instability and multiple forms of hardship, and for future research, the importance of specificity regarding the definitions and components of economic instability that are measured. Many questions remain regarding the role of economic instability in contributing to socioeconomic inequality and how public policies can be improved to reduce its harm. These findings have important implications for understanding and supporting families during the current and future large-scale economic crises.

CRediT authorship contribution statement

Taryn W. Morrissey: Conceptualization, Methodology, Writing - original draft, Project administration, Supervision, Funding acquisition. **Yun Cha:** Methodology, Data curation, Formal analysis, Visualization. **Sharon Wolf:** Conceptualization, Methodology, Project administration, Supervision, Funding acquisition. **Mariam Khan:** Data curation.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

This work was partially supported by a grant from the Policies and Programs to Reduce Child Poverty and its Effects Grant Program of the Institute for Research on Poverty, University of Wisconsin-Madison, U.S. Department of Health and Human Services Assistant Secretary for Planning and Evaluation.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.childyouth.2020.105502.

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