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Child-Care Instability and Behavior Problems: Does Parenting Stress Mediate the Relationship?

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Abstract

Child care instability is associated with more behavior problems in young children, but the mechanisms of this relationship are not well understood. Theoretically, this relationship is likely to emerge, at least in part, because care instability leads to increased parenting stress. Moreover, low socioeconomic status and single-mother families may be more vulnerable to the effects of instability. This study tested these hypotheses using data from the Fragile Families and Child Wellbeing study ($n=1,675$) and structural equation modeling. Three types of child care instability were examined: long-term instability, multiplicity, and needing to use back-up arrangements. Overall, findings showed little evidence that parenting stress mediated the associations between care instability and child behavior problems among the full sample. Among single-mother and low-income families, however, needing to use back-up arrangements had small positive associations with parenting stress, which partially mediated the relationship between that type of care instability and child externalizing behavior problems.

Keywords

child care arrangements; child development; Fragile Families and Child Wellbeing; parenting; stress; early childhood

Arranging non-parental care for children is a key aspect of modern parenting. The challenge of finding and maintaining affordable child care, which accommodates parents' child care preferences within various family and employment constraints, can lead parents to rely on multiple, concurrent providers (e.g., Gordon, Colaner, Usdansky, & Melgar, 2013; Morrissey, 2008) or to make frequent changes in providers as family and employment circumstances change (e.g., Davis, Carlin, Krafft, & Tout, 2014; Scott & Abelson, 2013). Single parents and those with low socioeconomic resources in particular face significant challenges in attaining stable care in the context of limited resources and low-wage employment (e.g., Henly & Lambert, 2005).

Prior research has consistently found that different types of child care instability—including changes in arrangements over time and experiencing multiple, concurrent arrangements—are associated with higher levels of behavior problems in young children of varying backgrounds (e.g., Claessens & Chen, 2013; Morrissey, 2009; NICHD Early Child Care

Research Network [ECCRN], 1998; Pilarz & Hill, 2014). These associations between child care instability and child behavior may be partially explained by the effects of instability on parents. Managing complex and changing child care arrangements is likely to increase parenting stress, which has been shown to influence child behavior (e.g., Crnic, Gaze, & Hoffman, 2005). Yet, despite the presumed importance of parenting stress as a mediator of these relationships, we know little from prior research about whether child care instability is related to parenting stress, and in turn, whether this relationship helps explain the effects of instability on child behavior.

This study contributes to the existing literature by empirically testing parenting stress as a mediator of the relationships between child care instability and child behavior problems using data from a birth cohort study of children born to predominantly unmarried parents in urban areas, the Fragile Families and Child Wellbeing Study (FFCWS). Structural equation modeling was used to predict child behavior problems at age 5 as a function of maternal parenting stress at age 3 and child care instability experienced between ages 1 to 3, controlling first for a large set of child and family characteristics and then also adjusting for prior parenting stress levels. We also examined whether family structure and socioeconomic resources moderate the associations between child care instability, parenting stress, and child behavior.

Background

Instability in non-parental care arrangements is a common experience for many young children. Prior research has identified three key types of care instability: long-term instability, multiplicity, and needing to use back-up arrangements (De Schipper, Tavecchio, Van IJzendoorn, & Linting, 2003; Morrissey, 2009; Pilarz & Hill, 2014; Tran & Weinraub, 2006). Long-term instability refers to sequential changes in non-parental care providers over a period of time, such as a move from one care setting to another. Prior studies suggest that at least 40–50% of children experience a provider change by age 3 years (Bratsch-Hines, Mokrova, Vernon-Feagans, & The Family Life Project Key Investigators, 2015; Pilarz & Hill, 2014; Tran & Weinraub, 2006). Multiplicity occurs when a child experiences two or more, concurrent providers within a single day or week at a point in time. Prior studies have found the prevalence of multiplicity increases with child age, with about 5–9% of children experiencing multiplicity at age 1 year to 13–14% at age 3 (Morrissey, 2009; Pilarz & Hill, 2014). In one study, needing to use back-up arrangements—due to the child's usual provider becoming temporarily unavailable due to an illness, holiday, or vacation—occurred in 29% of the sample (Pilarz & Hill, 2014).

All three types of child care instability have been linked to adverse child behavioral outcomes. Multiple studies have found that long-term instability and multiplicity are related to more behavior problems and/or fewer socio-emotional skills in early childhood (Bratsch-Hines et al., 2015; Claessens & Chen, 2013; De Schipper, Tavecchio, Van IJzendoorn, & Van Zeijl, 2004; De Schipper, Van IJzendoorn, & Tavecchio, 2004; Howes & Hamilton, 1993; Morrissey, 2009; NICHD ECCRN, 1998; Tran & Winsler, 2011). Using data from the FFCWS, Pilarz and Hill (2014) found that each change in care arrangements experienced by age 3 (i.e., long-term instability) was associated with .05 standard deviations more

externalizing behavior problems at age 3, whereas multiplicity at age 3 was associated with .16 to .22 standard deviations more internalizing and externalizing behavior problems. This was also the first study to show that needing to use back-up arrangements predicted more internalizing behavior problems at age 3.

The theoretical expectations for how child care instability might matter for child behavior include three possible mechanisms: First, by disrupting child-caregiver relationships, care instability may lead to lower-quality child care experiences because consistent and stable relationships are fundamental for children's formation of secure attachments and for sensitive caregiving (Barnas & Cummings, 1994; Raikes, 1993; Ritchie & Howes, 2003). Second, instability may disrupt a child's routines, including eating and sleep routines, which may lead to child stress and poor self-regulation (Fiese et al., 2002). Third, and the focus of this study, instability may increase the stress associated with parenting since parents are likely to find the process of changing providers and arranging multiple child care arrangements stressful. Parenting stress, a specific type of stress associated with the demands of caring for children, has been associated with less positive parenting and harsh discipline as well as child behavior problems (Abidin, 1992; Crnic & Low, 2002; Crnic et al., 2005; Deater-Deckard, 1998).

There are several reasons why child care instability may contribute to parenting stress. Changes in care arrangements require parents to establish new family routines and re-accommodate work and family demands, which may be stressful particularly if the changes are unpredictable or undesirable (Lowe, Weisner, & Geis, 2003; Lowe & Weisner, 2004). Multiple arrangements also involve coordinating work and child care schedules and transportation across multiple care providers, which may be challenging, especially if the arrangements are irregular or inconsistent (Chaudry, 2004; Henly & Lambert, 2005; Scott, London, & Hurst, 2005). Although the availability of back-up providers may be an asset to parents, the need to rely on back-up arrangements due to their regular provider's unavailability likely signals unpredictability in families' daily child care routines, which may also increase parents' stress (Gordon, Kaestner, & Korenman, 2008; Henly & Lyons, 2000; Usdansky & Wolf, 2008).

Qualitative studies of low-income, working parents confirm that changes in care arrangements and multiple arrangements are often driven by constraints rather than parents' preferences, and are experienced as stressful or not supportive of family well-being (Chaudry, 2004; Scott et al., 2005; Speirs, Vesely, & Roy, 2015). In fact, both child care instability and parental stress may be responses to instability in other aspects of families' lives, such as parental employment or family structure changes (Blau & Robins, 1998; Crosnoe, Prickett, Smith, & Cavanagh, 2014; Davis et al., 2014). If parents who are more stressed (due to a variety of reasons) are more likely to experience care instability, then the relationship between care instability and parenting stress may be bidirectional and accounting for prior stress levels will be important for assessing whether or not care instability leads to an increase in stress.

It is important to note that child care changes could also be stress reducing, if they represent parents' efforts to attain higher quality care or a provider that is a better fit with parents'

preferences, employment demands, or the family's needs (Gordon & Hognas, 2006; Scott & Abelson, 2013; Speirs et al., 2015; Wolf & Sonenstein, 1991). Similarly, multiplicity may reflect a purposive strategy for balancing parents' care preferences with employment and other constraints, and therefore may be supportive for parents (Gordon, et al., 2013; Morrissey, 2008). Without knowing the precise reasons for care changes or using multiple arrangements, we cannot fully anticipate whether these are stressful experiences or not.

Finally, bioecological theory suggests that parenting and child development occur in the context of family systems and societal, or "macro," contexts (Bronfenbrenner, 1994). In this case, we hypothesize that the effects of care instability on parenting stress may depend on family structure and socioeconomic resources. Higher socioeconomic status (SES) families may be more likely to attain preferred or higher quality arrangements (e.g., Ruzek, Burchinal, Farkas, & Duncan, 2014) because greater financial and human capital resources create a wider array of child care options. For the same reason, high SES families may be less likely to experience the types of unpredictable and undesired care changes and multiple arrangements that are likely to be stressful. Moreover, families with more socioeconomic resources may be better able to cope with care instability, and thus, the effects of instability on parenting stress may be less pronounced. For example, those with fewer resources may struggle to find and pay for a new provider when an arrangement falls through and thus experience more stress. Similarly, a spouse or partner in the household with whom to share caregiving responsibilities can serve as a resource for managing care changes and multiple arrangements, potentially lessening the disruption caused by care instability. Prior research has found limited evidence that family income moderates direct associations between care instability and child behavior (Claessens & Chen, 2013; Pilarz & Hill, 2014), but has not examined the moderating effects of maternal education or family structure.

Only one prior study has examined parenting stress as a potential mediator between a type of child care instability—multiplicity—and child behavior. Morrissey (2009) found that an increase in the number of concurrent arrangements used between ages 2 and 3 was associated with increases in behavior problems and decreases in prosocial behaviors, but that parenting stress did not mediate these associations. Importantly, this study used data that underrepresents minority and socioeconomically-disadvantaged families. Thus, the possibility remains that parenting stress could mediate these relationships among a less advantaged sample of families, for whom care instability may be more stressful. It is also unknown whether parenting stress may mediate associations between long-term instability or back-up arrangements and child behavior.

The purpose of this study was to examine whether the relationships between child care instability and child behavior problems operate through parenting stress. Using rich, longitudinal data from an urban, birth cohort study (FFCWS), we asked two research questions: 1) Does maternal parenting stress mediate the associations between each of three types of care instability—long-term instability, multiplicity, and needing to use back-up arrangements—and child behavior problems? 2) Do family structure and socioeconomic resources moderate the associations between instability and parenting stress, and in turn, moderate the associations between instability and behavior problems? Based on prior evidence, we expected that each form of instability would be positively associated with

parenting stress, and that, in turn, stress would be positively associated with behavior problems. Of the three forms of instability, we expected multiplicity to be less strongly associated with stress, since parents may strategically use multiple arrangements to meet the competing demands of work and family. We also hypothesized that the adverse associations between instability and stress would be stronger among those with fewer resources to manage care instability, namely low-educated, low-income, and single mothers.

Method

Data

This study used data from the FFCWS, a longitudinal, birth cohort study of 4,898 children born between 1998 and 2000 in 20 large U.S. cities with populations of 200,000 or more (Reichman, Teitler, Garfinkel, & McLanahan, 2001). The FFCWS oversampled non-marital births, such that nearly three-fourths of children were born to unmarried parents, resulting in a sample of predominantly low-income and non-white families. Families were recruited from hospitals, and both mothers and fathers were interviewed shortly after the child's birth. Follow-up telephone surveys were conducted when children were approximately 1, 3, 5, and 9 years of age. Child assessments were conducted during in-home interviews at the 3-year, 5-year, and 9-year waves. This study used data from the baseline, 1-year, and 3-year telephone surveys with mothers, as well as the 5-year in-home interview. Response rates ranged from 86% to 90% for the mothers' surveys, and were 81% for the 5-year in-home interview.

The analytic sample for this study consisted of children whose mothers participated in the 3-year survey and 5-year in-home interview, who lived with their biological mother, and who were in non-parental care at the 3-year wave. We excluded 667 children (14% of baseline sample) whose mothers did not participate in the 3-year survey and 1374 (28%) who did not participate in the 5-year in-home interview. We also excluded 22 children (<1%) not living with their biological mother at the 3-year wave and 1160 children (24%) who did not experience non-parental care at the 3-year wave because mothers who reported using exclusive parental care were not asked questions about care stability. The final analytic sample was 1675 children.

Descriptive analyses (not shown) indicate that as a result of attrition, the sample of cases who participated in the 3-year mothers' survey and 5-year in-home interview differed from the full FFCWS baseline sample in that it contains more Black and fewer Hispanic and other race/ethnicity mothers, fewer foreign-born mothers, and slightly more highly-educated mothers. Consistent with prior studies (e.g., Kalil, Dunifon, Crosby, & Su, 2014), we do not use sampling weights to adjust for sampling design or attrition because the FFCWS study does not provide weights for the in-home interviews. Finally, restricting the analysis to children in non-parental care at the 3-year wave leads to an analytic sample that includes slightly younger mothers, fewer married/cohabiting mothers, and more higher-income families than the FFCWS baseline sample.

In the final analytic sample, 83% of cases had complete data on all variables used in the analyses. Our key independent variables, mediators, and outcome variables had few missing

cases (less than 1%), but several covariates had a more substantial percentage of missing data (up to 10%). In order to reduce potential bias from the listwise deletion of cases with missing data (Allison, 2002), we used full information maximum likelihood (FIML) estimation methods to impute missing data. FIML uses a maximum likelihood function to compute model estimates using all available data from all cases regardless of missing data patterns and is a recommended approach to adjusting for missing data when data are not missing completely at random (Allison, 2003). We also estimated models using listwise deletion and found substantively similar results.

Table 1 provides sample descriptive statistics. Consistent with the FFCWS design, the sample is socioeconomically disadvantaged: At baseline, 57% of families had incomes below 200% of the federal poverty line (FPL); 58% of mothers had a high school degree or less education; 22% were married to child's father; and 76% were Black or Hispanic. At the 1-year survey, 65% of mothers were working, and 26% of children were primarily in relative care, 19% in center-based care, and 13% in non-relative care. We describe each measure in detail below.

Measures

Child care instability—Our three measures of child care instability capture instability experienced within the two years prior or at the time of the 3-year study wave using items from the mothers' survey. We measure long-term instability as the total number of changes in child care arrangements experienced between ages 1 and 3 years, based on the following item: "How many times have your child care arrangements changed since your child was one-year-old?" We measured multiplicity as an indicator for experiencing two or more concurrent child care arrangements at age 3, based on the question: "How many different child care arrangements are you currently using for your child?" The need to use back-up arrangements was defined as using "special arrangements" one or more times in the past month, based on the question: "Approximately how many times in the past month did you have to make special arrangements because your usual child care arrangement fell through?"

Parenting stress—This measure captures mothers' perceived stress brought on by the demands of caring for her child(ren) and was created from a four-item scale adapted from the Parenting Stress Index (Abidin, 1995). At the 1-year and 3-year surveys, mothers were asked to rate on a 4-point scale their level of agreement with each item from *strongly agree* (1) to *strongly disagree* (4): "Being a parent is harder than I thought it would be"; "I feel trapped by my responsibilities as a parent"; "I find that taking care of my children is much more work than pleasure"; and "I often feel tired, worn out, or exhausted from raising a family." We reverse-coded the items and computed the mean score so that higher scores indicate higher levels of stress (3-year wave $\alpha=.63$; 1-year wave $\alpha=.61$).

Child behavior problems—The FFCWS collected mothers' ratings of their child's behavior problems during the 5-year in-home interview with a subset of items from the Externalizing and Internalizing subscales of the Child Behavior Checklist/4–18 (CBCL; Achenbach, 1991). To measure externalizing behaviors, we used the Aggressive subscale of the CBCL (20 items; $\alpha=.85$), which includes items about being disobedient, arguing and

fighting, and destroying things. To measure internalizing behaviors, we used the Anxious/Depressed and Withdrawn subscales (22 items; $\alpha=.76$), which include items about being unhappy, shy, nervous, and fearful. Mothers rated each item based on whether the behavior was *not true* (0), *somewhat/sometimes true* (1), or *very/often true* (2) of the child; items were summed to create a total score for each subscale, with higher scores indicating higher levels of behavior problems.

Control variables—To adjust for potential confounding variables that may be related to child care instability, maternal parenting stress, and child behavior problems, we used a large set of control variables. We controlled for factors that theoretically may influence parenting stress and/or child behavior (Abidin, 1992; Crnic & Low, 2002; Deater-Deckard, 1998) and also be related to care instability. Most controls were measured at the baseline or 1-year surveys, prior to children's experiences of care instability. However, our findings were robust to controlling for changes across time in various domains (housing moves, family structure and income, and mothers' employment status, schedules, and school enrollment), and to including measures of family structure and income and maternal education from the 1-year survey.

Child-level controls from the baseline and 1-year survey included: gender; low birth weight; health status; and temperament, using the mean score on three items that captures the child's tendency to become easily and intensely aroused from the Emotionality scale of the Emotionality, Activity, and Sociability Temperament Survey for Children ($\alpha=.60$; Mathiesen & Tambs, 1999). We controlled for the child's age at the 3- and 5-year waves to adjust for differences in age that may contribute to parenting stress and child behavior.

Maternal and family characteristics taken from the baseline survey included the mother's age; race/ethnicity; immigrant status; highest level of education; as well as family structure and family income. Family structure was based on the mother's relationship to the child's father as the FFCWS did not ask about relationships with other partners at baseline. We used the following controls from the 1-year survey: number of adults and children in the household; mother's self-reported health status; and maternal depression, using an indicator for the mother met the criteria for a major depressive episode based on the Composite International Diagnostic Interview-Short Form (CIDI-SF; Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998; for more information see FFCWS [2005]). To control for the level of support the mother receives with parenting, we included a measure of the mother's perceived quality of co-parenting with the child's father based on six items that assess how much she trusts and can count on the father to take good care of their child and he supports her in raising their child ($\alpha=.86$). We created an indicator for high co-parenting quality based on scoring above the median on this scale.

Maternal employment and child care characteristics were drawn from the 1-year survey since experiences of care instability between the 1- and 3-year waves could influence mothers' employment and child care decisions at the 3-year wave. Mothers' employment characteristics included: hours worked; working any nonstandard hours (i.e., evenings after 6pm, overnight, weekends, or variable shifts) in current or most recent job; and enrolled in school or training program. We controlled for the type of care of the child's primary

arrangement, use of full-time non-parental care (21 hours per week or more), and an indicator for the mother reported receiving help paying for care from a government agency to measure child care subsidy receipt.

Moderators—We used three baseline characteristics: low maternal education, defined as no more than a high school degree (or equivalent); low income, defined as family income less than 200% FPL; and single parent, defined as not married to or cohabiting with the child's father.

Analytic Plan

To examine whether maternal parenting stress mediates the relationships between child care instability and child behavior problems, we estimated a structural equation model using maximum likelihood estimation in Mplus 7.3 (Muthén & Muthén, 1998–2012). The mediation model predicts child behavior at age 5 years as a function of parenting stress (when children were 3 years old) and child care instability experienced at age 3 and in the two years prior; parenting stress, in turn, is predicted by child care instability.

We used two distinct model estimation approaches to minimize endogeneity bias. In Model 1, we estimated a basic mediation model with a large set of control variables measured at the baseline and 1-year waves (shown in Table 1). In Model 2, we estimated a residualized change model (also called a lagged dependent variable model), in which we added to Model 1 a measure of parenting stress from the 1-year wave to adjust for observed and unobserved time-invariant factors that contribute to parenting stress. Model 2 estimates can be interpreted as the effects of child care instability on a change in parenting stress and provide more conservative estimates of the relationships between instability and parenting stress. Both models included a measure of child temperament from the 1-year wave to adjust for child-level time invariant differences that may contribute to both care instability and child behavior problems.

Several statistics were used to evaluate model fit. We present results for the Chi-square statistic (χ^2), for which a p -value greater than .05 is considered to indicate good fit (Bowen & Guo, 2011). We also used the root mean square error of approximation (RMSEA) and its 95% confidence interval; RMSEA values less than or equal to 0.05 are considered to indicate good fit (Browne & Cudeck, 1993). The comparative fit index (CFI) and Tucker-Lewis index (TLI) are considered to indicate good fit for values greater than or equal to .95, and the standardized root-mean-square residual (SRMR) indicates good fit for values of .08 or less (Hu & Bentler, 1999).

To identify statistically significant evidence of mediation, we estimated the indirect effects of child care instability on child behavioral outcomes and their corresponding 95% bias-corrected bootstrap confidence intervals based on 5,000 bootstrap samples. Bias-corrected bootstrap confidence intervals are recommended for assessing the statistical significance of indirect effects because the confidence limits of the estimate tend to be asymmetric, and other statistical tests, such as the Sobel test, assume a standard normal distribution for the indirect effect (MacKinnon, Lockwood, & Williams, 2004; Preacher, Rucker, & Hayes, 2007).

We also estimated a moderated mediation model to test the hypothesis that the relationship between child care instability and parenting stress would be stronger among single mothers and those with low socioeconomic resources. We followed Preacher et al.'s (2007) approach to moderated mediation by adding three sets of interaction terms (nine total) between each type of care instability and each of the three hypothesized moderators to the model one set at a time, and then estimating the conditional indirect effects for each subgroup (and 95% bias-corrected bootstrap confidence intervals) only when the interactions were significant at $p < .10$.

Results

Testing for Mediation

Results from basic model—Model fit statistics indicated that the model was a good fit to the data (see Table 2). Results from mediation Model 1 showed associations between long-term instability and the need to use back-up arrangements with maternal parenting stress; however, multiplicity was not related to parenting stress (see Figure 1). For example, a change in child care arrangements between ages 1 and 3 was associated with scoring .04 standard deviations higher on parenting stress at age 3. Additionally, parenting stress at age 3 was associated with higher levels of both externalizing and internalizing behavior problems at age 5.

Estimates and 95% bias-corrected bootstrap confidence intervals of the indirect effects provide evidence that parenting stress partially mediated the associations between long-term instability and externalizing and internalizing behavior problems, as well as the associations between the need to use back-up arrangements and behavior problems (see Table 3). For instance, the need to use back-up arrangements was associated with scoring 0.011 standard deviations higher on externalizing behaviors due to higher levels of parenting stress. Results also showed statistically significant relationships between child care instability and behavior problems, suggesting that pathways other than maternal parenting stress were also at play (see Figure 1). Overall, the model provides evidence that the effects of long-term instability and the need to use back-up arrangements on behavior problems were partially mediated by parenting stress, but suggests that the effects of multiplicity on child behavior were not.

Results from residualized change model—Mediation Model 2 estimated a residualized change model by adding a prior measure of parenting stress to test whether the associations between care instability and behavior problems were mediated by an increase in stress associated with instability. Model fit statistics indicated that the model was a good fit (see Table 2).

In contrast to Model 1 findings, Model 2 showed little evidence of mediation as none of the three measures of child care instability were associated with parenting stress and the coefficients of parenting stress in predicting behavior problems decreased substantially and/or were no longer statistically significant (see Figure 2). Moreover, estimates of the indirect effects were substantially smaller than in Model 1 and were not statistically significant (see Table 3). Nevertheless, after accounting for prior parenting stress, results continued to show associations between each type of instability and externalizing behaviors

and between multiplicity and internalizing behaviors. Taken together, these findings suggest that the relationships between child care instability and child behavior problems were not mediated by an increase in parenting stress and instead suggest that mothers who had higher levels of parenting stress to begin with may have been more likely to subsequently experience child care instability.

Testing for Moderated Mediation

When we added interactions between each type of instability and either mothers' relationship status, level of education, or family income to Model 2, we found support for the hypothesis that the associations between child care instability and parenting stress would be stronger among single mothers and low-SES mothers (results not shown in a table). We present and discuss results from interaction terms (standardized on the endogenous variables) that were statistically significant at $p < .10$. The interactions between long-term instability and low education ($\beta = 0.064$, $p = .074$), between back-up arrangements and single mother status ($\beta = 0.183$, $p = .048$), and between back-up arrangements and low family income ($\beta = 0.167$, $p = .074$) in predicting parenting stress were positive, statistically significant, and small in magnitude. For example, needing to use back-up arrangements was associated with a 0.183 standard deviations greater increase in parenting stress among single mothers relative to married or cohabiting mothers. Interestingly, we also found evidence that the direct effects of needing to use back-up arrangements on child behavior problems were larger among children with low-educated mothers. The interactions between back-up arrangements and mothers' low education were positive and statistically significant in predicting externalizing ($\beta = 0.244$, $p = .019$) and internalizing behavior problems ($\beta = 0.323$, $p = .002$). Model fit statistics for these moderated mediation models indicated good fit (see Table 3 notes).

In cases where interactions terms were statistically significant at $p < .10$, we then estimated the conditional indirect effects of child care instability on child behavior for those subgroups (bottom panel of Table 3). The conditional indirect effects of needing to use back-up arrangements on externalizing behavior problems were positive and statistically significant for single-mother and low-income families, suggesting that an increase in parenting stress partially mediated the association between needing to use back-up arrangements and externalizing behaviors among these subgroups. For instance, among single-mother families, needing to use back-up arrangements was associated with scoring 0.010 standard deviations higher on externalizing behaviors due to an increase in parenting stress. However, for low-educated mothers, the conditional indirect effects of long-term instability were not statistically significant. By comparison, none of the conditional indirect effects for the subgroups of mothers who were higher-educated, married/cohabiting, or higher-income were statistically significant. Overall, the findings suggest that, after adjusting for prior parenting stress, an increase in stress associated with needing to use back-up arrangements partially mediated the relationship between back-up arrangements and externalizing behaviors among single-mother and low-income families.

Discussion

This study sought to understand whether parenting stress mediates the established relationships between several types of child care instability—long-term instability, multiplicity, and needing to use back-up arrangements—and child behavior problems, and whether these relationships depend on family structure and socioeconomic status. To address these questions, we estimated structural equation models in which child behavior problems were modeled as a function of maternal parenting stress and child care instability. We used longitudinal data from the FFCWS study, which consists predominantly of unmarried, low-income parents, who face particular challenges in managing work and caregiving demands and maintaining stable care (Chaudry, 2004; Henly & Lambert, 2005; Scott et al., 2005).

We found limited evidence that maternal parenting stress mediates the relationships between specific types of child care instability and child behavior problems. In a basic mediation model with a rich set of control variables, parenting stress was a partial mediator of the adverse associations between long-term instability or needing to use back-up arrangements and externalizing and internalizing behavior problems. However, in a residualized change model, which adjusted for mothers' prior stress levels, we found no statistically significant relationships between any form of care instability and an increase parenting stress and thus, found no evidence of mediation. These findings suggest that mothers who were more stressed to begin with were more likely to subsequently experience care instability compared to less stressed mothers.

Consistent with our expectations, however, our results differed by family structure and socioeconomic resources. Among single-mother and low-income families, needing to use back-up arrangements was associated with small increases in parenting stress, which partially mediated the relationships between back-up arrangements and externalizing behaviors even after controlling for prior stress levels. These results suggest that single and low-income mothers may find it more difficult to cope with temporary care disruptions by virtue of having fewer social and economic resources to which to turn. Even so, for these subgroups, the indirect associations between back-up arrangements and externalizing behaviors through parenting stress were small in magnitude (0.01 standard deviations), and in comparison to the direct associations between back-up arrangements and externalizing behaviors (0.12 standard deviations). Our results also suggest that the direct, adverse associations between needing to use back-up arrangements and behavior problems are stronger for children with less-educated than higher-educated mothers.

Our finding that child care instability does not, on average, relate to an increase in mothers' parenting stress may indicate that parents make child care changes and use multiple, concurrent arrangements to better accommodate work and family demands and to manage their own stress. Although these strategies may be supportive for parents, they may ultimately take a toll on children's behavioral development. After adjusting for prior levels of parenting stress, we continued to observe direct relationships between each type of instability and child behavior problems. These results are consistent with Morrissey's (2009) study, which found no evidence that parenting stress mediated the relationships between multiplicity and child behavior.

We found most consistent evidence of relationships between child care instability and externalizing behavior problems, with small effect sizes ranging from 0.05 to 0.15 standard deviations. Multiplicity, but not the other forms of instability, was associated with scoring 0.14 standard deviations higher on internalizing behavior problems. Our findings are similar to Pilarz and Hill's (2014) study using the FFCWS that found associations between care instability experienced by age 3 and child behavior at age 3. However, in this prior study needing to use back-up arrangements at age 3 was associated with more internalizing behaviors at age 3, whereas this study found associations with externalizing behaviors at age 5. Our findings are also consistent with prior studies using different samples that have found adverse associations between long-term instability or multiplicity and child behavior (e.g., Bratsch-Hines et al., 2015; Claessens & Chen, 2013). Further research is needed to understand which types of care instability are related to different aspects of children's behavioral functioning at different ages.

One important limitation of this study is that it is non-experimental and thus not capable of providing conclusive evidence of the causal relationships between child care instability, parenting stress, and child behavior problems. Importantly, we did not attempt to model all of the likely pathways that could explain a relationship between care instability and child behavior. Instead, we used a clear theoretical framework and longitudinal data to model a plausible temporal ordering of one pathway. Despite controlling for a large set of child, maternal, and family covariates, the study still faces potential bias from omitted variables, measurement error, and simultaneity. Most importantly, no observational data can rule out a reverse causal relationship in which child behavior problems increase parenting stress while also complicating care stability. The most likely direction of bias, however, would be upward, due to the predicted positive relationship between parenting stress and care instability. Upward bias is not a concern for the null findings in the full sample, but may be more relevant in the subgroup results.

Our key measures are also limited in several ways. Because both the parenting stress and child behavior measures were reported by mothers, any relationship between the two could be biased by a mother's state of mind. Also, the internal consistency scores for the parenting stress and child temperament measures are acceptable but not strong. In addition, each type of instability we examined was measured using a single survey question, some of which require substantial recall on the part of the respondent. The FFCWS study did not collect information about daily instability or within-arrangement instability (e.g., changes in caregivers within the same care setting), the effects of which might operate through different pathways. We also do not observe care instability prior to age 1 when it might be particularly stressful or disruptive.

Finally, the data we used were drawn from a sample of children born in large U.S. cities to predominantly non-married parents, and the results may not be generalizable to the broader U.S. context or other populations. Measures of care instability were only available for children in non-parental care at age 3, and thus, similar to other studies of care instability, our sample was restricted to children in non-parental care (e.g., Morrissey, 2009; Pilarz & Hill, 2014). There is not a clear pattern of attrition or our sample restriction creating a more

or less economically-advantaged sample. Even so, our findings should not be generalized to the FFCWS population.

Findings from this study have implications for future research and policymaking. We found that parenting stress accounts at most for a small portion of the effects of care instability on child behavior problems and only among specific subgroups of families. Future studies should test other mediating pathways, like the quality of child-caregiver interactions and child stress. In addition, although we did not find that long-term instability or multiplicity were related to an increase in parenting stress, this does not mean that these types of instability may not be stressful under certain conditions. Parents' reasons for changing care arrangements and using multiple arrangements are likely varied (Gordon et al., 2013; Speirs et al., 2015), and thus, future research should explore potential heterogeneity in how different types of care instability are perceived by and affect parents. Finally, future research should seek to more fully understand how the use of back-up arrangements contributes to parent and child well-being.

One of the only policy changes that has been implemented to address child care instability is a Child Care and Development Block Grant Reauthorization Act of 2014 requirement that requires states to assign low-income, working families a minimum 12-month eligibility period for child care subsidies before redetermining their eligibility. To the extent that this policy change reduces instability in subsidy use and child care, our findings suggests that this policy change may yield benefits for children's behavioral development. Further, increasing access to child care subsidies may help low-income parents access more reliable care and reduce the need for back-up arrangements (Forry & Hofferth, 2011), which our findings suggest would benefit children as well as single and low-income mothers. Finally, given that experiences of care instability are common and that their effects are at most only partially mediated by parenting stress, this study suggests the importance of developing best practices for supporting children during child care transitions to prevent adverse behavioral consequences.

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Figure 1.

Mediation Model 1 Results. $N=1675$. Estimates were standardized on the endogenous variables (outcomes and mediator). Non-significant paths not shown. Model included all control variables listed in Table 1. ^ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 2. Mediation Model 2 Results. $N=1675$. Estimates were standardized on the endogenous variables (outcomes and mediator). Non-significant paths not shown. Model included all control variables listed in Table 1 and a measure of parenting stress from the 1-year wave. * $p<.05$, ** $p<.01$

Table 1

Sample Descriptive Statistics

	M	SD	%
Child behavior problems (at 5-year wave)			
Externalizing	10.73	6.24	
Internalizing	5.15	4.01	
Maternal parenting stress			
Parenting stress at 3-year wave	2.25	0.66	
Parenting stress at 1-year wave	2.18	0.66	
Child care instability (at 3-year wave)			
Long-term instability	0.81	1.21	
Multiplicity			13.8
Use of back-up arrangements			27.9
Control variables			
<i>Child characteristics</i>			
Gender is male			53.0
Low birth weight			10.0
Child health is poor/fair/good (at 1-year wave)			11.8
Temperament score (at 1-year wave)	2.83	1.03	
Child age at 3-year wave (months)	35.25	2.16	
Child age at 5-year wave (months)	61.20	2.38	
<i>Maternal and family characteristics</i>			
Mother's age (years)	25.00	5.94	
Mother's race/ethnicity			
non-Hispanic White			21.4
non-Hispanic Black			54.4
Hispanic			21.6
non-Hispanic other			2.6
Mother born outside U.S.			10.5
Mother's high level of education			
Less than high school			26.2
High school or equivalent			31.5
Some college or technical school			30.2
College degree or higher			12.1
Family structure			
Married			21.6
Cohabiting			34.3
Romantically involved			29.2
Other relationship			14.9
Family income			
0–99% FPL			32.1
100–199% FPL			25.3

	M	SD	%
200–299% FPL			17.3
≥300% FPL			25.3
Number of adults in HH (at 1-year wave)	2.15	0.93	
Number of children in HH (at 1-year wave)	2.23	1.26	
Mother's health is poor/fair/good (at 1-year wave)			36.6
Maternal depression (at 1-year wave)			16.5
High coparenting quality (at 1-year wave)			49.3
<i>Child care and maternal employment characteristics (at 1-year wave)</i>			
Type of primary care arrangement			
Center-based			19.1
Family child care/non-relative care			12.5
Relative care			25.9
Parental care only			42.5
Full-time non-parental care (21 hours/week +)			48.2
Child care subsidy receipt			13.4
Mother's employment status			
Not working			34.8
Employed part-time (<30 hours/week)			11.3
Employed full-time (30 hours/week +)			53.9
Nonstandard work schedule			64.6
Enrolled in school/job training			21.0
Moderators			
Mother is single (not married/cohabiting)			44.1
Low family income (<200% FPL)			57.4
Low maternal education (high school degree or lower)			57.7

Source: FFCWS Baseline, 1-Year, 3-Year, and 5-Year Wave Mother Surveys and 5-year In-Home Interview.

Notes: $N=1675$. Control variables were measured at baseline wave unless otherwise noted. Results are unweighted.

Table 2**Mediation Model Results**

Parameter Estimates	Unstandardized	Standardized	p-value
Mediation Model 1^a			
Long-term instability→ Externalizing behaviors	0.333 (0.121)	0.053	.006
Multiplicity→ Externalizing behaviors	0.952 (0.424)	0.153	.025
Use of back-up arr. → Externalizing behaviors	0.762 (0.324)	0.122	.019
Long-term instability→ Internalizing behaviors	0.133 (0.080)	0.033	.097
Multiplicity→ Internalizing behaviors	0.574 (0.280)	0.143	.040
Use of back-up arr. → Internalizing behaviors	0.357 (0.213)	0.089	.094
Long-term instability→ Parenting stress	0.027 (0.013)	0.041	.042
Multiplicity→ Parenting stress	0.072 (0.047)	0.109	.126
Use of back-up arr. → Parenting stress	0.068 (0.036)	0.103	.059
Parenting stress→ Externalizing behaviors	0.991 (0.222)	0.105	< .000
Parenting stress→ Internalizing behaviors	0.430 (0.146)	0.071	.003
Mediation Model 2^b			
Long-term instability→ Externalizing behaviors	0.317 (0.121)	0.051	.009
Multiplicity→ Externalizing behaviors	0.930 (0.424)	0.149	.028
Use of back-up arr. → Externalizing behaviors	0.742 (0.324)	0.119	.022
Long-term instability→ Internalizing behaviors	0.120 (0.080)	0.030	.133
Multiplicity→ Internalizing behaviors	0.556 (0.279)	0.139	.046
Use of back-up arr. → Internalizing behaviors	0.342 (0.213)	0.085	.108
Long-term instability→ Parenting stress	0.007 (0.012)	0.011	.556
Multiplicity→ Parenting stress	0.031 (0.040)	0.047	.441
Use of back-up arr. → Parenting stress	0.036 (0.031)	0.055	.239
Parenting stress→ Externalizing behaviors	0.634 (0.263)	0.067	.016
Parenting stress→ Internalizing behaviors	0.148 (0.173)	0.024	.393

Source: FFCWS Baseline, 1-Year, 3-Year, and 5-Year Wave Mother Surveys and 5-year In-Home Interview.

Notes: $N=1675$. Unstandardized estimates and standard errors are shown in the Unstandardized column. Standardized estimates were standardized on the endogenous variables (outcomes and mediator). Results are unweighted. Models 1 and 2 included all control variables listed in Table 1. Model 2 also included a measure of parenting stress from the 1-year wave.

^aModel fit statistics: $\chi^2(3)=6.05$, $p=.11$; RMSEA=0.025 with a 95% confidence interval of [0.000, 0.053]; CFI=.997; TLI=.872; and SRMR=.002

^bModel fit statistics: $\chi^2(3)=5.94$, $p=.11$; RMSEA=0.024 with a 95% confidence interval of [0.000, 0.053]; CFI=.998; TLI=.919; and SRMR=.002

Table 3

Indirect Effects and Conditional Indirect Effects of Child Care Instability on Child Behavior through Parenting Stress

	Externalizing Behaviors		Internalizing Behaviors	
	Estimate	BC Bootstrap 95% CI	Estimate	BC Bootstrap 95% CI
<u>Panel 1: Indirect Effects</u>				
Mediation Model 1				
Long-term instability	0.004	[0.0003, 0.010]	0.003	[0.0002, 0.008]
Multiplicity	0.011	[-0.002, 0.030]	0.008	[-0.001, 0.023]
Use of back-up arrangements	0.011	[0.001, 0.026]	0.007	[0.001, 0.020]
Mediation Model 2				
Long-term instability	0.001	[-0.002, 0.004]	0.000	[-0.001, 0.003]
Multiplicity	0.003	[-0.004, 0.016]	0.001	[-0.002, 0.011]
Use of back-up arrangements	0.004	[-0.001, 0.015]	0.001	[-0.001, 0.009]
<u>Panel 2: Conditional Indirect Effects</u>				
Moderated Mediation Model 2^a				
Long-term instability				
Low level of education	0.002	[-0.001, 0.008]	0.001	[-0.001, 0.005]
Higher level of education	-0.002	[-0.009, 0.001]	-0.001	[-0.006, 0.001]
Use of back-up arrangements				
Single	0.010	[0.001, 0.030]	0.004	[-0.004, 0.018]
Married/Cohabiting	-0.001	[-0.019, 0.006]	0.000	[-0.009, 0.002]
Low-income	0.009	[0.001, 0.025]	0.003	[-0.003, 0.016]
Higher-income	-0.002	[-0.016, 0.005]	-0.001	[-0.012, 0.002]

Source: FFCWS Baseline, 1-Year, 3-Year, and 5-Year Wave Mother Surveys and 5-year In-Home Interview.

Notes: $N=1675$. Estimates of indirect and conditional indirect effects are standardized on the child behavior outcome. Conditional indirect effects are shown only for the subgroups in which the interaction term between child care instability and the subgroup (i.e., mothers' education, relationship status, or income) was statistically significant at $p<.10$ in Moderated Mediation Model 2. Results are unweighted. Models 1 and 2 included all control variables listed in Table 1. Model 2 also included a measure of parenting stress from the 1-year wave. BC=bias-corrected; CI=confidence interval.

^aModel fit statistics:

Adding interactions with mother's relationship status: $\chi^2(3)=6.06$, $p=.11$; RMSEA=0.025 with a 95% confidence interval of [0.000, 0.053]; CF1=.998; TLI=.913; and SRMR=.002

Adding interactions with mother's education: $\chi^2(3)=5.72$, $p=.13$; RMSEA=0.023 with a 95% confidence interval of [0.000, 0.052]; CF1=.998; TLI=.923; and SRMR=.002

Adding interactions with family income: $\chi^2(3)=5.87$, $p=.12$; RMSEA=0.024 with a 95% confidence interval of [0.000, 0.053]; CF1=.998; TLI=.919; and SRMR=.002