NIH Public Access
Author Manuscript
Early Child Res Q. Author manuscript; available in PMC 2015 January 27.

Published in final edited form as:
Early Child Res Q. 2014 ; 29(4): 471–483. doi:10.1016/j.ecresq.2014.05.007.

Unstable and Multiple Child Care Arrangements and Young Children's Behavior

Alejandra Ros Pilarz[a] and **Heather D. Hill**[b]

Heather D. Hill: hhill@uchicago.edu

[b]University of Chicago, School of Social Service Administration, 969 E. 60th Street, Chicago, IL 60637, United States, Phone: 1-773-702-1142, Fax: 1-773-702-0874

Abstract

Growing evidence suggests that child care instability is associated with child behavior problems, but existing studies confound different types of instability; use small, convenience samples; and/or control insufficiently for selection into child care arrangements. This study uses survey and calendar data from the Fragile Families and Child Well-Being Study to estimate the associations between three different types of child care instability—long-term instability, multiplicity, and the use of back-up arrangements—and children's internalizing, externalizing, and prosocial behaviors at age 3, controlling for a large number of child and family background characteristics. Long-term instability between birth and age 3, as measured in both the survey and calendar data, is associated with higher levels of externalizing behavior problems. Current multiplicity at age 3 (as measured by survey data) is associated with higher levels of both externalizing and internalizing behavior problems, but stable multiplicity over time (as measured using calendar data) is not. Finally, the use of back-up arrangements at age 3 is associated with higher levels of internalizing behaviors. We find no consistent differences in these results by the timing of instability, child gender, family income, or type of care.

Keywords

Child care; stability; multiplicity; socio-emotional development

Emerging evidence indicates that instability in non-parental child care arrangements threatens child developmental processes. Experiencing a greater number of child care arrangements or multiple, concurrent arrangements is consistently associated with more internalizing and externalizing behavior problems and fewer prosocial behaviors in children younger than age 5 (Claessens & Chen, 2013; De Schipper, Van IJzendoorn, & Tavecchio, 2004; Morrissey, 2009; National Institute of Child Health and Human Development Early

© 2014 Elsevier Inc. All rights reserved.

[a]Corresponding author: University of Chicago, School of Social Service Administration, 969 E. 60th Street, Chicago, IL 60637, United States, Phone: 1-773-383-9266, aros1@uchicago.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Child Care Research Network [NICHD ECCRN], 1998). Theoretical hypotheses suggest that experiencing multiple child care arrangements, either sequentially or concurrently, may make it difficult for young children to develop secure and sensitive relationships with non-parental caregivers and that negotiating new and multiple child care environments may be stressful for children (Ahnert, Pinquart, & Lamb, 2006; Gunnar, 2006; Lamb & Ahnert, 2006; Shonkoff & Phillips, 2000).

Many unanswered questions remain in this relatively new area of research. Most prior studies focus on one type of child care instability (e.g. experiencing multiple, concurrent arrangements) or confound different types of instability, making it difficult to know which types of instability may be driving the observed effects on children's development. Several existing studies use small, convenience samples, making it difficult to generalize their results (Cryer et al., 2005; Howes & Hamilton, 1993; Howes & Stewart, 1987). Others do not control sufficiently for child and family characteristics that are likely to confound estimates of the relationship between child care instability and child outcomes (Bacharach & Baumeister, 2003; De Schipper, Van IJzendoorn, et al., 2004).

In addition, in order for parents, child care providers, and policy advocates to prevent child care instability or buffer children against the effects of instability, we need to parse out the specific relationships between different types of child care instability and child behavior. For instance, if experiencing multiple changes in child care arrangements over time is more detrimental than having multiple, concurrent arrangements at any one time, this information would be useful to policy-makers designing child care regulations and child care subsidy and early education programs. As parents weigh a complex set of preferences and constraints when making child care decisions (Chaudry, Henly, & Meyers, 2010; Meyers & Jordan, 2006; Weber, 2011), to the extent that parents have choices, a better understanding of the effects of child care instability could also be informative for deciding whether or not to change arrangements or to use multiple arrangements.

This study uses longitudinal data from the Fragile Families and Child Well-Being Study (FFCWS), to examine the associations between three types of child care instability—long-term instability, multiplicity, and the use of back-up arrangements—and child behavior at three years of age. We address the shortcomings of the existing literature by using a large, national sample of low- to middle-income families and by constructing multiple measures of child care instability using both survey and child care calendar data. This approach allows us to estimate the effects of both concurrent and longitudinal instability, as well as whether those effects differ by the timing of instability in relation to child's age. In addition, we leverage the rich FFCWS data to control for a large set of child and family characteristics that may confound the relationships between child care instability and children's behavioral outcomes, including a measure of children's temperament at age 1.

Theoretical Framework

In early childhood, child care experiences constitute an important influence on child development and well-being. According to developmental theory, development occurs through regular and repeated, reciprocal interactions between children and their environment

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

(Bronfenbrenner, 1999; Bronfenbrenner & Morris, 2006; Sameroff, 2009). Stability and continuity in child care providers promotes positive interactions between children and caregivers and the development of secure attachment relationships (Ahnert et al., 2006; Barnas & Cummings, 1994; Howes & Hamilton, 1992; Raikes, 1993). To the extent that frequent changes in providers or multiple, concurrent providers prevent these secure relationships from forming, child care instability may result in adverse behavioral and socio-emotional outcomes in early and middle childhood (Howes & Hamilton, 1993; Howes, Hamilton, & Matheson, 1994; Howes, Hamilton, & Philipsen, 1998; Howes, Rodning, Galluzzo, & Myers, 1988; Oppenheim, Sagi, & Lamb, 1988).

Additionally, child care instability may disrupt family routines and create stress for parents and children, which may in turn interfere with positive parenting and lead to child behavior problems (Conger et al., 1992; Fiese et al., 2002; McLoyd, 1998; Yeung, Linver, & Brooks–Gunn, 2002). Research suggests that parents, particularly those with low income, often find it difficult and stressful to manage changing employment demands and child care arrangements (Chaudry, 2004; Henly & Lambert, 2005; Henly & Lyons, 2000; Lowe & Weisner, 2004; Scott, London, & Hurst, 2005). It may also be difficult and stressful for children to adapt to and navigate multiple social environments with different rules and expectations, teaching and discipline styles, and peer groups. This is evidenced by studies of children's transitions into new preschool or elementary school classrooms, which find that children's stress levels peak at the beginning of the school year and then drop-off over time (Bruce, Poggi Davis, & Gunnar, 2002; Gunnar, Tout, de Haan, Pierce, & Stanbury, 1997; Russ et al., 2012).

It is important to note that not all changes in child care providers or multiple, concurrent arrangements will be detrimental to children's development. Changes that are planned and purposeful and that lead to higher quality or more developmentally-appropriate care, such as transitioning from in-home care to center-based care during the preschool years, may lead to more positive outcomes (Ansari & Winsler, 2013; Morrissey, 2010). In these cases, any negative effects of changing to a new setting or new caregiver may be short-lived or outweighed by benefits. Moreover, the effects of long-term instability may be non-linear, such that any adverse effects occur only after children have experienced multiple provider changes.

Prior Research

Prior studies identify two primary types of child care instability: *Long-term instability* refers to changes in non-parental caregivers over a period of time, such as between birth and kindergarten entry, that occur when a child leaves a child care arrangement (e.g. switches from one child care center to another) or when a child changes to a new caregiver within the same setting. *Multiplicity* refers to experiencing multiple, concurrent child care arrangements over the course of a single day or week on a regular basis (Adams & Rohacek, 2010; De Schipper, Tavecchio, Van IJzendoorn, & Linting, 2003; Morrissey, 2009; Tran & Weinraub, 2006). Both long-term instability and multiplicity have each been associated with adverse effects on a range of socio-emotional outcomes in early childhood, including internalizing and externalizing behavior problems and prosocial behaviors (Claessens &

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Chen, 2013; De Schipper et al., 2003; De Schipper, Tavecchio, Van IJzendoorn, & Van Zeijl, 2004; De Schipper, Van IJzendoorn, et al., 2004; Howes & Hamilton, 1993; Howes & Stewart, 1987; Morrissey, 2009; NICHD ECCRN, 1998; Tran & Winsler, 2011). Two of these studies also suggest that changes in arrangements are associated with a reduction in negative behaviors (e.g. noncompliance) in the child care setting (NICHD ECCRN; Tran & Winsler), perhaps suggesting that children who experience a greater number of arrangements become better able to adapt to the demands of new settings over time.

Children may also experience disruptions in their regular child care routines due to foreseen or unforeseen changes in the child care providers' schedule or availability, resulting in the use of temporary *back-up arrangements* (Gordon, Kaestner, & Korenman, 2008; Usdansky & Wolf, 2008), which we conceive of as a less-studied third type of child care instability. For example, parents may use back-up arrangements when their regular provider is temporarily unavailable due to a holiday, vacation, or illness. Children may experience back-up arrangements as stressful to the extent that they disrupt families' regular routines and/or result in the child being cared for by a less familiar caregiver. In general, we expect back-up arrangements to be less detrimental to children's behavior than either multiplicity or long-term instability because they represent short-term disruptions to children's regular care arrangements and daily routines, but not disruptions of their long-term relationships with their regular child care providers.

Importantly, prior studies tend to examine the effects of either long-term instability or multiplicity and may therefore confound the effects of these different constructs because children who have multiple, concurrent arrangements may also be more likely to experience more child care providers over the long-term (Claessens & Chen, 2013; Howes & Hamilton, 1993; Howes & Stewart, 1987; NICHD ECCRN, 1998; Tran & Winsler, 2011). The few studies that examine longterm instability and multiplicity together, but as separate variables, find inconclusive results (De Schipper et al., 2003; Loeb, Fuller, Kagan, & Carrol, 2004). In addition, many studies of this topic rely on the NICHD Study of Early Child Care and Youth Development (SECCYD) data (Morrissey, 2009; NICHD ECCRN, 1998; Tran & Weinraub, 2006), which underrepresents minority and socio-economically disadvantaged families. Other studies use small convenience samples (Howes & Hamilton, 1993; Howes & Stewart, 1987) or international samples (Claessens & Chen, 2013; De Schipper, Van IJzendoorn, et al., 2004), making it difficult to assess the generalizability of the results to U.S. children.

Potential Moderators

There are several reasons to believe that young children, particularly infants, are most vulnerable to the potentially adverse effects of child care instability. Limited evidence suggests that changes in child care arrangements prior to age 24 months are associated with less secure relationships with child care providers at age 24 and 30 months (Howes & Hamilton, 1992), and that infants and young toddlers experience changes in caregivers as more stressful compared to older toddlers (Cryer et al., 2005). Morrissey (2009) found that children who experienced multiple arrangements at younger ages (age 24 months) demonstrated a greater increase in behavior problems than those who experienced these at older ages (36 months).

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Boys and children in low-income families may also be more likely to suffer adverse effects of child care instability. Prior research suggests that boys are more vulnerable to stress (Crockenberg, 2003), and low-income children are more likely to experience instability in other aspects of their lives (Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999; Adam & Chase- Lansdale, 2002; Moore, Vandivere, & Ehrle, 2000). Finally, instability might interact with the type of care children experience. On one hand, if center-based care is, on average, of higher quality than home-based care (Li-Grining & Coley, 2006; Rigby, Ryan, & Brooks-Gunn, 2007), we might expect center-based care to buffer the effects of instability (Tran & Weinraub, 2006). On the other hand, center-based care has been associated with higher levels of behavior problems in young children (Coley, Votruba-Drzal, Miller, & Koury, 2013; NICHD ECCRN, 2004) and may instead aggravate the effects of instability on child behavior. Overall, studies examining gender, income, or type of care as a moderator find no consistent results (Claessens & Chen, 2013; Morrissey, 2009; Tran & Winsler, 2011; Youngblade, 2003).

The Current Study

The purpose of this study is to examine the associations between long-term instability, multiplicity, and the use of back-up arrangements and young children's behavior in a sample of low- to middle-income families with young children, ages 0 to 3 years. We address three questions: (1) Do long-term instability, multiplicity, and the use of back-up arrangements predict children's behavior at age 3 years? (2) Does the timing of instability matter? (3) Are the effects of child care instability moderated by the child's gender, family income, or the type of child care?

Based on prior research, we hypothesize that long-term instability, the use of back-up arrangements, and multiplicity will each be associated with higher levels of behavior problems and lower levels of prosocial behaviors. With regard to the timing of instability, we expect that the effects of instability experienced prior to age 1 year will be more detrimental than instability experienced between one and three years. Finally, we hypothesize that boys and children from poor families may be more vulnerable to the effects of child care instability, and that centerbased care may either buffer or aggravate the effect of instability on children's behavior.

Method

Sample

This study uses data from the Fragile Families and Child Well-being Study (FFCWS), a longitudinal birth cohort study of approximately 4,900 children born between 1998 and 2000 in 20 large, U.S. cities. FFCWS oversampled non-marital births, such that of the total sample approximately 3,600 children were born to unmarried parents (compared to about 1,300 born to married parents). FFCWS recruited families from hospitals and attempted to interview both mothers and fathers shortly after their child's birth (Reichman, Teitler, Garfinkel, & McLanahan, 2001). Follow-up telephone surveys were conducted with both parents when children were approximately one, three, five, and nine years of age. Additionally, the study conducted in-home assessments that included a parent survey, child

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

assessments, and child care and parental employment history calendars when children were approximately three and five years of age.

We focus on child care instability between birth and age 3, using data from the baseline, one-year, and three-year telephone surveys of mothers and the three-year in-home interview. Attrition reduces the original FFCWS sample to 4,140 (86 percent response rate) for the threeyear mothers' telephone survey and to 3,288 (79 percent) for the three-year in-home interview. We excluded 437 children from the two pilot cities of the three-year in-home interview because these pilot studies did not administer the child care calendar and used different measures of children's prosocial behaviors than the remaining 18 cities. We also excluded 64 children who did not live with their mother most or all of the time and 1,701 children who were in parental care only at the three-year mothers' survey. Our final *survey sample* consists of families in 18 cities whose focal child was in non-parental care and lived with their biological mother at the three-year study wave (N=1,637). Of the families included in the survey sample, approximately 530 participated in the parent questionnaire portion of the three-year in-home interview over the phone and did not complete a child care calendar and were therefore excluded from the calendar sample. The final *calendar sample* includes 68 percent of the survey sample families that completed a child care calendar during the three-year in-home interview (N=1,105). Following convention when using a sub-sample of FFCWS respondents (Berger, Carlson, Bzostek, & Osborne, 2008; Carlson, Pilkauskas, McLanahan, & Brooks-Gunn, 2011; Razza, Martin, & Brooks-Gunn, 2010; Ryan, Johnson, Rigby, & Brooks-Gunn, 2011; Ryan, Kalil, & Leininger, 2009), we do not apply the FFCWS survey weights in our analyses, but we include controls for family characteristics at the time of the child's birth for which the weights adjust: mother's marital status, age, race/ethnicity, and level of education.

The percentage of cases with missing data on any one item ranged from less than 1 percent to 4 percent. Because the values on the dependent variables (mother-reported behavioral outcomes) were computed by summing multiple items in a scale, children who had 25 percent or more items missing in any scale were coded as having a missing score in that scale and were dropped from our analysis. In order to reduce bias from non-random missingness, we used multiple imputation to replace missing values of the independent variables in the model using the Markov chain Monte Carlo (MCMC) technique. This generates multiple imputed datasets, which are then used to estimate the analysis models (Allison, 2002). We performed 20 imputations using Stata 12. We deleted one case that was missing the dependent variable in the analyses predicting prosocial behaviors. As a sensitivity test, we ran the analyses using listwise deletion and found substantively similar results.

Measures

Child care instability—Table 1 provides summary statistics and definitions of the survey and calendar measures of child care instability used in this study. Three measures of child care instability are available in the one-year and three-year mothers' telephone surveys: long-term instability, current use of back-up arrangements, and current multiplicity. At each survey wave, mothers were asked if the child was currently being cared for by anyone other

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

than the custodial parents (including non-residential fathers) on a regular basis, defined as at least once per week for the past month. If mothers reported not using non-parental care, they were not asked any other questions about child care arrangements.

The child care calendar in the three-year in-home interview collected information on all child care arrangements from birth until the child was approximately 3-years-old, including overlapping or concurrent arrangements. In contrast to the mothers' telephone survey, which only counted care provided by non-residential fathers as child care arrangements, all father care—regardless of whether or not the father resided in the household—was counted as a child care arrangement in the calendar. The respondent was asked to provide the start and end dates of each arrangement (recorded in yearly quarters), which we used to create measures of long-term instability and stable multiplicity.

Long-term instability: The survey measure of long-term instability captures the total number of arrangement changes the child experienced between birth and age 3. The total number of arrangement changes was computed by summing mothers' responses to the following question at the one-year and three-year telephone surveys: "How many times have your child care arrangements changed since your child was born/one-year old?" Mothers whose children were in parental care only at the one-year telephone survey were not asked this question, and therefore, these children were coded as having zero provider changes between birth and age 1. In the survey sample, children experienced an average of 1.2 arrangement changes (*SD* = 1.6) by age 3 years, and 31.1 percent experienced two or more arrangement changes.

The calendar measure of long-term instability sums the total number of transitions that the child experienced from birth until the three-year in-home assessment. A transition was defined as the start of a new arrangement or a new set of arrangements. For example, when a child begins care with two or more concurrent providers at the same time, this was counted as one transition. Thus, a child could have fewer transitions than total providers. A transition was also counted if the child resumes child care with a previous provider after a break of at least three months (one quarter). The calendar measure of long-term instability is very similar to the survey measure; however, the total number of transitions in the calendar measure includes the first transition into non-parental care, whereas the total number of changes in the survey measure should not. Therefore, children with two child care transitions in the calendar measure would likely report one arrangement change in the survey measure. On average, children in the calendar sample experienced 1.9 transitions (*SD* = .98) by age 3 years, and 23.8 percent experienced three or more transitions (which is equivalent to two or more arrangement changes).

Because the effects of long-term instability may be non-linear, we tested for threshold effects by measuring long-term instability with a set of dichotomous variables for the number of changes in arrangements. We used the following set of dichotomous variables to test for threshold effects: zero changes (i.e. one transition in calendar measure; reference group); one change (i.e. two transitions); two changes (i.e. three transitions); or three or more changes (i.e. four or more transitions). Once we determined that experiencing only one change was not associated with more adverse behavioral outcomes, we used a dichotomous

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

variable to estimate the effects of two or more changes in arrangements relative to zero or one (see Results section).

Current use of back-up arrangements: This survey measure captures short-term changes in children's current, regular child care arrangements that result in the use of "special" or backup arrangements. An indicator for whether or not the child experienced back-up arrangements was created based on mothers' response to the following survey question at the three-year survey wave: "Approximately how many times in the past month did you have to make special arrangements because your usual child care arrangement fell through?" Children who experienced one or more "special" arrangements in the past month were coded as experiencing current back-up arrangements. We also use a measure of current use of back-up arrangements at age 1 based on mothers' response to the same item at the one-year survey wave. In the survey sample, 28.5 percent experienced back-up arrangements at age 3 years and 15.2 percent experienced back-up arrangements at age 1 year.

Multiplicity: The survey measure, current multiplicity, is a dichotomous variable indicating whether a child experienced two or more regular, concurrent arrangements at the three-year survey wave. The measure of multiplicity is based on mothers' response to the following question: "How many different child care arrangements are you currently using for your child?" Current multiplicity at age 1 is based on mothers' response to the same item at the one-year survey wave. In the survey sample, 14.0 percent of children had current multiplicity at age 3 years and 9.2 percent had current multiplicity at age 1 year.

The calendar measure, stable multiplicity, is a dichotomous variable indicating whether a child had multiple, concurrent arrangements that lasted for six or more consecutive months (i.e. two yearly quarters). Because child care arrangement start and end dates were recorded by quarters, it is not possible in the data to differentiate between two concurrent arrangements that last one quarter and two consecutive arrangements that end and begin in the same quarter. If we counted two concurrent arrangements that overlap by only one quarter in our measure of multiplicity, we would likely overstate the percentage of children with multiple arrangements. This restricts our calendar measure of multiplicity to a measure of stable multiplicity or multiple, concurrent arrangements lasting for six or more consecutive months. While this is a limitation of the calendar data, it allows us to compare stable multiplicity measured longitudinally with the calendar data to the point-in-time survey measure of multiplicity, which does not distinguish between short and long spells of multiple arrangements. We use the term "stable multiplicity" only to differentiate this measure from our survey measure of "current multiplicity." We hypothesize that "current multiplicity" captures multiple arrangements lasting less than six months as well those lasting six months or more, and thus "stable multiplicity" captures a subset of multiple arrangements that are more stable on average, as evidenced by the relatively low correlation (r = .14) between these two measures of multiplicity in Table 2. In the calendar sample, 7.5 percent of children experienced stable multiplicity by age 3 years.

Table 2 provides the pairwise correlations among the measures of child care instability. The correlations within and across the survey and calendar measures are low to moderate in size. The highest correlation is between the survey and calendar measures of long-term instability

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

(r = .31) as we would expect given that these two measures are capturing a similar construct but were collected via different methods.

Child behavior outcomes—Table 3 presents descriptive statistics for the three child behavior measures. During the three-year in-home interview, the child's mother (or primary caregiver) was asked to respond to a set of items about the child's behavior problems and prosocial behaviors. Children's externalizing and internalizing behavior problems were measured using items from the 1992 Child Behavior Checklist 2-3 (CBCL; Achenbach, 1992). Externalizing behavior problem scores are the sum of 15 items on the Aggressive Subscale (α = .86), and internalizing behavior problem scores are the sum of 25 items on the Anxious/Depressed and Withdrawn Subscales of the CBCL (α = .82). Because the full externalizing behavior sub-scale of the 1992 CBCL/2-3 also includes the Destructive subscale and several items from this scale were not available, in a sensitivity check, we re-ran the analyses with an externalizing behavior problems score that did include the available Destructive subscale items, and the results were very similar. Prosocial behaviors were measured with a subset of nine items from the Express Subscale of the Adaptive Social Behavior Inventory (α = .72) ASBI; (Hogan, Scott, & Bauer, 1992). To facilitate interpretation of the results, we standardize scores on behavioral outcomes to a mean of 0 and a standard deviation of 1 based on the full analytic sample (survey sample).

Prior studies of child care instability and children's behavioral outcomes have relied on mothers' ratings of children's behavior (Claessens & Chen, 2013), child care providers' ratings (De Schipper, Tavecchio, et al., 2004), or both (Morrissey, 2009; NICHD ECCRN, 1998). Mother-reported and provider-reported ratings of children's behavior may differ due to reporter biases or differences in children's behavioral functioning across different settings (Cai, Kaiser, & Hancock, 2004). Only a small subset of children's primary child care providers were observed and interviewed at the three-year wave of the FFCWS study (N = 810); therefore, we use only mothers' ratings of children's behavior.

Control variables—We included in all models a set of baseline covariates and a set of time-varying covariates measured at post-baseline surveys that may be correlated with both our child care instability measures and child behavioral outcomes (see Table 3 for descriptive statistics).

Child characteristics: We controlled for the child's gender (female is the reference group), child's age at the three-year survey wave, and an indicator for having been born with a low-birth weight (less than 2,500 grams). We also controlled for child's temperament measured at the one-year wave with the average of the mother-reported score on six items from the Emotionality and Shyness scales of the Emotionality, Activity, and Sociability Temperament Survey for Children (Mathiesen & Tambs, 1999).

Maternal and family characteristics: Characteristics of the child's mother include mothers' age (at the child's birth), an indicator for non-native born, and an indicator for being interviewed in Spanish (a proxy for level of English proficiency). Mothers' race/ethnicity was included as a set of four dichotomous variables for White, non-Hispanic (reference group); Black, non-Hispanic; Hispanic; or other race/ethnicity. Level of education

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

was included as a set of four dichotomous variables: less than high school degree, high school degree or equivalent (reference group), some college, and college degree or higher.

Family structure was based on the biological parents' relationship at the time of the child's birth and included four categories: 1) married (reference group); 2) unmarried, cohabiting; 3) parents unmarried, romantically-involved; and 4) other (including friendly and no relationship at all). Family income as a percentage of the federal poverty line (FPL) was included in the models as a set of dichotomous variables for 0-49 percent; 59-99 percent; 100- 199 percent; 200-299 percent; and 300 percent FPL and above (reference group). The number of adults and children living in the household at the time of the child's birth were also included as continuous variables. We constructed two additional variables that take into account changes in families and income across time: indicators for having a change in family structure since the child's birth and for having family income fall below the poverty line at any survey wave.

Because the child outcome measures are based on mothers' reports of children's behaviors and mothers suffering from depression may rate their children's behavior more negatively relative to non-depressed mothers (Fergusson, Lynskey, & Horwood, 1993; Najman et al., 2000), we also included a measure of maternal depression at the three-year survey wave in all models. Maternal depression was measured as an indicator for whether or not the child's 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).

Child care and maternal employment characteristics: An indicator for whether or not the child was in non-parental care at the one-year survey wave served as a proxy for age of entry into non-parental care. Measures from the three-year survey include: type of primary child care arrangement, total weekly hours in child care, and maternal employment status. Center care refers to day care centers, Early Head Start, Head Start, and preschool programs. Non-relative care refers to care provided in a family child care home or by other non-relatives, and relative care (reference group) is care provided by relatives, including a non-resident father. The total number of weekly hours the child spends in child care was measured with a set of dichotomous variables: part-time (20 hours or less); full-time (21-40 hours; reference group); and more than 40 hours per week. Mother's employment status was also measured with a set of dichotomous variables corresponding to the number of work hours per week: not employed (reference group), working part-time (less than 30 hours per week), working full-time (30-40 hours per week) or working more than 40 hours per week.

Based on the figures shown in Table 3, children who participated in the calendar sample appear to be slightly more disadvantaged at baseline compared to those who did not complete a child care calendar in terms of maternal age, education, marital status, and family income. Children in the calendar sample also showed slightly higher (and statistically significant) levels of internalizing (mean difference = .70) and externalizing behaviors (mean difference = .97) relative to children who did not have a completed calendar.

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Analytic Plan

Multivariate OLS regression was used to examine the relationships between measures of child care instability and children's behavioral outcomes at age 3 years for the survey and calendar samples separately. In Model 1, each child behavior outcome (standardized) was regressed on the survey or calendar measures of child care instability and all control variables. Because the age at which children entered non-parental care varies across the sample, with some children starting care before age 1 and others starting care later, children who started nonparental care before age 1 had more opportunity to experience child care instability because they experienced non-parental care for more time. As a sensitivity test and in order to account for differences in age of entry into child care, in Model 2 we restricted the sample to children who were in non-parental care at the one-year-wave.

Timing Analyses—To examine the timing of effects of long-term instability, multiplicity, and back-up arrangements, we disaggregated the measures of instability by the child's age. In the survey sample analyses, one-year wave and three-year wave measures of each type of instability (long-term instability, current use of back-up arrangements, and current multiplicity) were entered into models predicting behavioral outcomes at age 3 years. For the calendar sample analyses, we were able to measure the number of transitions experienced between birth and age 1, between age 1 and age 2, and between age 2 and age 3. We were unable to do the same for stable multiplicity because children who experienced multiplicity in one time period were highly likely to experience multiplicity in other time periods due to our definition of stable multiplicity (i.e. six or more consecutive months of multiple, concurrent arrangements). In Model 3, each behavior outcome variable was regressed on child-age-specific measures of instability (from the survey and the calendar) and all control variables.

Moderation Analyses—In order to examine our third research question—whether the effects of instability and multiplicity are moderated by the child's gender, family income, or type of care, we included a set of interaction terms in Model 1. Four measures of instability and multiplicity (survey and calendar measures of long-term instability, current use of back-up arrangements, and current multiplicity) were each interacted separately with: (a) an indicator for male gender; and (b) an indicator for having ever been poor at any of the first three waves of the study (baseline, one-year, and three-year). We had insufficient sample size to interact stable multiplicity with these moderators. To test for moderation by type of care, we interacted current multiplicity and current use of back-up arrangements separately with an indicator for current use of center-based care (at the three-year wave). Each interaction term was entered separately into models predicting behavior outcomes, controlling for all covariates.

Results

Analysis of Survey Measures

Table 4 presents results from multivariate OLS regression models predicting motherreported child behavior outcomes at age 3 years from the survey measures of instability and multiplicity. Model 1 includes all children in the survey or calendar sample; Model 2 is

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

restricted to children in non-parental care at the one-year survey wave. Because our outcome variables are standardized to a mean of 0 and standard deviation of 1, the coefficients can be interpreted in terms of standard deviation units or effect sizes.

Long-term instability—The survey measure of long-term instability was associated with higher levels of externalizing behavior problems at age 3, but was not associated with internalizing behavior problems or prosocial behaviors (Model 1). Each child care arrangement change was associated with scoring .05 standard deviations higher on externalizing behavior problems. Because the effects of long-term instability may be non-linear, we tested for threshold effects by measuring long-term instability with a set of dichotomous variables for the number of changes in arrangements (see Measures section; for results, see Table A1 in online supplementary material). Experiencing only one change in arrangements was associated with *better* behavioral outcomes (although the coefficient on one change was only statistically significant for internalizing behaviors), but two and three changes were generally predictive of adverse behavioral outcomes. More specifically, experiencing two or more arrangement changes (relative to one or none) was associated with scoring .18 standard deviations higher (*SE* = .05; *p* = .001) on externalizing behavior problems (see Table A2 in online supplementary material for complete results). We found no association between two or more arrangement changes and internalizing behavior problems (*B* = .07; *SE* = .05; *p* = .16) or prosocial behaviors (*B* = .07; *SE* = .05; *p* = .22). Restricting the sample to children in non-parental care at the one-year wave in Model 2 did not substantively change the results.

Current use of back-up arrangements—Children who experienced back-up arrangements at age 3 scored .11 standard deviations higher on internalizing behavior problems at age 3 (Model 1). This association did not hold when we restricted the sample to children in non-parental care at the one-year wave in Model 2. Experiencing back-up arrangements was not associated with externalizing behavior problems or prosocial behaviors.

Current multiplicity—Children who experienced current multiplicity at age 3 scored .16 standard deviations higher on internalizing behavior problems and .22 standard deviations higher on externalizing behavior problems at age 3 (Model 1). Current multiplicity was not associated with prosocial behaviors. Restricting the sample to children in non-parental care at the one-year wave did not substantively change the results for externalizing behavior problems; however, the association between current multiplicity and internalizing behavior problems was no longer statistically significant.

Analysis of Calendar Measures

Table 5 presents results from multivariate OLS regression models predicting child behavior outcomes at age 3 years from the calendar measures of instability and multiplicity. The same models and covariates are used here as in the analysis of survey measures.

Long-term instability—Long-term instability was a statistically significant predictor of externalizing behavior problems, but was not associated with either internalizing behavior

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

problems or prosocial behaviors. Each child care transition was associated with scoring .09 standard deviations higher on externalizing behavior problems in Model 1. Restricting the sample in Model 2 to children in non-parental care at the one-year wave did not substantively change the results. The coefficient of long-term instability increased to .11 standard deviations in the model predicting externalizing behavior problems.

As with the survey sample, we tested for threshold effects by measuring long-term instability with a set of dichotomous variables for the number of changes in arrangements (see Measures section; for results, see Table A1 in online supplementary material). Similar to the results using the survey measure, we found that experiencing only one change in arrangements (equivalent to two transitions in the calendar results) was not associated with higher levels of behavior problems. Experiencing two or more changes (equivalent to three or more transitions in the calendar results) relative to zero or one change was associated with scoring .24 standard deviations (*SE* = .07; *p* = .001) higher on externalizing behavior problems and with scoring .15 standard deviations (*SE* = .07, *p* = .028) higher on internalizing behavior problems, but was not associated with prosocial behaviors (*B* = .08; *SE* = .07; *p* = .22) in Model 1 (see Table A2 in online supplementary material for complete results). However, the association with internalizing behavior problems did not hold when we restricted the sample to children in non-parental care at the one-year wave (Model 2). These findings suggest that any adverse effects of child care arrangement changes may be non-linear and only appear when children experience two or more changes.

Stable multiplicity—In both Models 1 and 2, stable multiplicity was not a statistically significant predictor of children's internalizing or externalizing behavior problems or prosocial behaviors at age 3.

Analysis of Timing and Moderation

We conducted separate analyses of instability and multiplicity by child's age using the survey and calendar measures (results shown in Table 6). In Model 3, each child behavior outcome variable was regressed on the survey or calendar measures of instability disaggregated by child age and on the full set of control variables.

Overall, we did not find evidence that child care instability experienced earlier in life is more detrimental to children's behavioral outcomes at age 3. Contrary to our expectations, instability at later ages was associated with more behavior problems. For long-term instability, only changes experienced most recently (between age 1 and age 3 in the survey sample and between age 2 and age 3 in the calendar sample) were associated with higher levels of externalizing behavior problems. Similarly, we found larger effects of current multiplicity experienced at age 3 than at age 1 on externalizing and internalizing behavior problems. One exception is current back-up arrangements, for which the results suggest that instability at any age is likely to be associated with higher levels of internalizing behaviors. Surprisingly, longterm instability earlier in life (between birth and age 2) in the calendar sample was associated with higher levels of prosocial behaviors. One possibility is that experiencing more child care transitions and being exposed to greater numbers of non-parental caregivers and peer groups facilitates the development of prosocial skills. It is

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

important to note, however, that we were unable to replicate these results in the survey sample.

As with our main models, we conducted sensitivity tests by re-estimating Model 3 with the sub-sample of children who were in non-parental care at the one-year wave. The findings were mostly null with the exception of back-up arrangements at age 1, which was associated with scoring .16 standard deviations higher on internalizing behavior problems at age 3 (*SE* = .06; $p = .014$; see Table A3 in online supplementary material). In either the survey or the calendar analyses, we found no consistent evidence that the associations between child care instability and child behavior are moderated by the child's gender, family income, or the type of child care (for results, see Tables A4-A6 in online supplementary material).

Discussion

This study examined the associations between three distinct types of child care instability—long-term instability, multiplicity, and the use of back-up arrangements—and children's behavioral outcomes at age 3 years among a sample of predominantly low-income, minority children born to unwed parents. Using both survey and child care calendar data to construct different measures of long-term instability and multiplicity, we found that the number of changes in arrangements experienced between birth and age 3 (long-term instability), as measured in both the survey and calendar data, was positively associated with externalizing behavior problems. In particular, children who changed arrangements two or more times demonstrated more behavior problems relative to children who experienced zero or one change. In addition, children who experienced back-up arrangements at age 3 demonstrated higher levels of internalizing behavior problems relative to children in non-parental care who did not experience back-up arrangements. We found that current multiplicity at age 3 was associated with higher levels of both externalizing and internalizing behavior problems, but stable multiplicity over time (as measured using calendar data) was not. However, when we conducted sub-group analyses with the sample of children who were in non-parental care at age 1, we no longer observed the associations between internalizing behaviors and current multiplicity or the use of back-up arrangements. We also found no consistent evidence that these relationships were moderated by child gender, family income, type of care, or the timing of instability. Together, these findings add considerable support and nuance to our understanding of how child care instability matters for young children's behavior.

Several key findings emerged in this study. First, consistent with prior research (Howes & Hamilton, 1993; NICHD ECCRN, 1998), we found that the number of changes in arrangements experienced between birth and age 3 was positively associated with externalizing behavior problems. However, only children who changed arrangements two or more times demonstrated higher levels of behavior problems relative to children who experienced zero or one change. These threshold effects suggest that changing arrangements once between birth and age 3 may be quite normative and that long-term instability that is detrimental for children's behavior may be better defined as multiple arrangement changes during this developmental period. These findings are also important for developing theory about the amount of change that is disruptive to children's developmental processes.

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Second, we found that current multiplicity was associated with more behavior problems. This finding provides additional evidence to the small but growing literature (Claessens & Chen, 2013; Morrissey, 2009), which finds adverse effects of current multiplicity (i.e. multiple, concurrent arrangements at a point in time) on children's behavior. The effects sizes are modest and consistent with prior studies. For internalizing and externalizing behavior problems, the effect of experiencing two or more changes in arrangements, back-up arrangements, and current multiplicity are comparable to the adjusted gender differences in behavior problems (effect size ranges from .13 to .19 standard deviations) and to about half of the adjusted effect of maternal depression on behavior problems (effect size ranges from .23 to .36 standard deviations).

Third, although we found that current multiplicity predicts behavior problems, we found no evidence that stable multiplicity, which captures a subset of multiple arrangements lasting 6 months or more, was associated with children's behavioral outcomes. This finding could suggest a potentially important interactive relationship between multiplicity and instability, whereby only unstable multiple arrangements are detrimental, or that the adverse effects of multiplicity on children's behavior are short-lived. The latter hypothesis is supported in part by our timing analyses, which suggest that the effects of multiplicity on behavior problems were larger for current multiplicity at age 3 than current multiplicity at age 1. Importantly, we also found that children who did not have a completed child care calendar (and were therefore excluded from the calendar sample) demonstrated statistically significantly lower levels of externalizing and internalizing behavior problems. We cannot rule out the possibility that the different findings between the survey (i.e., current multiplicity) and calendar (i.e., stable multiplicity) measures of multiplicity are due to these sample differences, although our concerns are tempered by the similar findings across the survey and calendar samples with regard to long-term instability.

Fourth, and in contrast to previous research (Claessens & Chen, 2013; Morrissey, 2009), we did not find consistent evidence of adverse effects of any type of child care instability on prosocial behaviors. The inconsistency of findings on this behavioral measure may reflect differences in sample composition and differential effects of child care instability on prosocial behaviors as a function of family socioeconomic status. Whereas our FFCWS sample consisted of predominantly low-income and minority children born to unwed parents in the U.S., other studies have analyzed international samples (Claessens & Chen, 2013) or used data from the NICHD SECCYD study (Morrissey, 2009), which underrepresents minority and socioeconomically disadvantaged children.

Finally, we provide some evidence that short-term changes in children's regular care arrangements may be associated with adverse behavioral outcomes. Experiencing back-up arrangements within the past month at age 3 was associated with more internalizing behavior problems among our sample of children who were in non-parental care at age 3. Importantly, the coefficients on the effects of current back-up arrangements and current multiplicity at age 3 on internalizing behaviors become insignificant in models limited to children in non-parental care at age 1, suggesting that children who have more recently transitioned into child care may find these experiences as more distressing, whereas children who have been in child care since a young age may be better able to adapt to these types

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

instability. It is also possible that the effects of child care instability on internalizing behavior problems are short-lived. In support of this, Cryer et al. (2005) found that infants and toddlers showed increased levels of distress and lower levels of externalizing behaviors immediately following a transition to a new child care classroom, but these returned to pre-transition levels within 3 weeks. Future research should further explore this possibility, as well as further explore the use of back-up arrangements as a type of child care instability distinct from long-term instability and multiplicity. Much remains to be learned about how and under what conditions short-term changes to children's regular arrangements may impact their development.

We also examined whether instability and multiplicity experienced earlier in life are more detrimental to child behavior and whether the effects of instability and multiplicity are moderated by child gender, family income, and type of care. Consistent with prior research, we found no consistent evidence of these moderating relationships. With respect to the timing of instability, we found no consistent evidence that earlier instability matters more as we had expected. In general, our results suggest that long-term instability and multiplicity experienced at older ages were associated with more behavior problems at age 3, and surprisingly, we found some evidence that earlier long-term instability was associated more prosocial behaviors. Importantly, we did not replicate these findings with the sub-sample of children who had entered non-parental care at age 1. It is possible that the associations between recent changes and behavior problems are driven by children who had recently entered non-parental care and may suggest that changes in arrangements have no lasting adverse effects (and potentially beneficial effects on prosocial behaviors).

Several limitations of this study are worth noting. Although we control for an extensive set of child and family characteristics that may confound the relationships between child care instability and children's behavioral outcomes, the possibility remains that we have left out additional confounding variables not available in our data, for example, the quality of child care arrangements, local child care market characteristics, and specific measures of family functioning. For instance, if children in low-quality child care also experience more child care instability, then it is possible that our results are also capturing the influence of low-quality care. We were not able to include a measure of child care quality in our models because the FFCWS only collected such a measure for a small sub-sample of respondents. Similarly, if children who experience child care instability are also more likely to experience other types of family instability (e.g. parental employment instability) that are correlated with children's behavior, this may also bias our results. It is also possible that the observed effects are in the opposite direction, such that children with more behavior problems experience more instability as a result. Thus, the coefficients in our models should not be interpreted as causal estimates of the effects of child care instability on children's behavior.

This study was also limited by the measures of child care instability and children's behavior available in the data. Only mothers whose children who were in regular, non-parental care at the time of the FFCWS surveys were asked any questions about child care arrangements. Thus, the child care experiences of children who were in parental care only at the time of the survey wave but who had experienced child care in between the waves were not captured in the survey data. The child care calendar data allowed us to create more nuanced measures of

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

longterm instability and multiplicity by providing a retrospective account of children's child care arrangements from birth to age 3, but start and end dates were coded in yearly quarters, which likely leads to under-estimating the amount of multiple, concurrent arrangements children experienced. The calendar data may also understate the amount of child care instability that children experienced since parents may not be able to recall arrangements that they used for short periods of time. Additionally, our analyses were constrained by the data to predicting children's behavioral outcomes at age 3, and in the case of the survey data to predicting age 3 outcomes from child care experiences at ages 1 and 3 only. Ideally, we would have had measures of both children's behavior and child care experiences at additional time points and at shorter intervals.

Despite these limitations, this study provides further evidence that long-term instability, the use of back-up arrangements, and multiplicity are each associated with moderately-sized adverse effects on young children's behavior at age 3. It also provides suggestive evidence that the effects of multiplicity may depend on how multiplicity is measured and whether or not multiple arrangements are long-term and stable. The results highlight the importance of ensuring that all families with young children have access to stable, high-quality child care.

Other important topics for future research on child care instability include the determinants of arrangement changes and of using multiple, concurrent arrangements. Knowing what family and child care provider circumstances predict instability and multiplicity could help us better understand why these conditions are associated with adverse effects on child behavior, and how policy or program interventions might promote stable, single-provider relationships. Our findings suggest that it may be important to differentiate between multiple, concurrent arrangements that are long-lasting versus those that are short-lived. In order to address these unanswered questions, there is a need for new data sources utilizing data collection methods, such as time diaries or retrospective calendars collected at shorter time intervals, that are more appropriate for capturing more detailed information on the length, timing, and overlap in child care arrangements over time.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

The authors thank Scott Allard, Amy Claessens, and Julia Henly for helpful guidance during this project, and Adam Winsler and three anonymous reviewers for comments on earlier drafts. The Fragile Families and Child Well-Being Study was supported in part by the Columbia Population Research Center through Award Numbers R25HD074544, R24HD058486, and R01HD036916 awarded by the Eunice Kennedy Shriver National Institute of Child Health and Human Development. Heather Hill also receives office space and computing resources from the Population Research Center at NORC and the University of Chicago (National Institute for Child Health and Human Development grant 5R24HD051152-07). The content of this manuscript is solely the responsibility of the authors.

References

Achenbach, TM. Manual for the Child Behavior Checklist/2-3 and 1992 profile. Burlington, VT: University of Vermont Department of Psychiatry; 1992.

NIH-PA Author Manuscript NIH-PA Author Manuscript NIH-PA Author Manuscript

Ackerman BP, Kogos J, Youngstrom E, Schoff K, Izard C. Family instability and the problem behaviors of children from economically disadvantaged families. Developmental Psychology. 1999; 35(1):258–268.10.1037/0012-1649.35.1.258 [PubMed: 9923480]

Adam EK, Chase-Lansdale LP. Home sweet home(s): Parental separations, residential moves, and adjustment problems in low-income adolescent girls. Developmental Psychology. 2002; 38(5):792–805.10.1037/0012-1649.38.5.792 [PubMed: 12220056]

Adams, G.; Rohacek, M. Child care instability: Definitions, context, and policy implications. Washington, DC: Urban Institute; 2010.

Ahnert L, Pinquart M, Lamb ME. Security of children's relationships with nonparental care providers: A meta-analysis. Child Development. 2006; 77(3):664–679.10.1111/j.1467-8624.2006.00896.x [PubMed: 16686794]

Allison, PD. Missing Data. Thousand Oaks, CA: Sage; 2002.

Ansari A, Winsler A. Stability and sequence of center-based and family childcare: Links with low-income children's school readiness. Children and Youth Services Review. 2013; 35(2):358–366. http://dx.doi.org/10.1016/j.childyouth.2012.11.017.

Bacharach VR, Baumeister AA. Child care and severe externalizing behavior in kindergarten children. Journal of Applied Developmental Psychology. 2003; 23(5):527–537. http://dx.doi.org/10.1016/S0193-3973(02)00140-5.

Barnas MV, Cummings EM. Caregiver stability and toddlers' attachment-related behavior towards caregivers in day care. Infant Behavior and Development. 1994; 17(2):141–147. http://dx.doi.org/10.1016/0163-6383(94)90049-3.

Berger LM, Carlson MJ, Bzostek SH, Osborne C. Parenting practices of resident fathers: The role of marital and biological ties. Journal of Marriage and Family. 2008; 70(3):625–639.10.1111/j.1741-3737.2008.00510.x [PubMed: 21909158]

Bronfenbrenner, U. Environments in developmental perspective: Theoretical and operational models. In: Friedman, SL.; Wachs, TD., editors. Measuring environment across the life span. Washington, DC: American Psychological Association; 1999. p. 1-28.

Bronfenbrenner, U.; Morris, PA. The bioecological model of human development. In: Lerner, RM.; Damon, W., editors. Handbook of child psychology. Hoboken, NJ: John Wiley & Sons Inc; 2006. p. 793-828.

Bruce J, Poggi Davis E, Gunnar MR. Individual differences in children's cortisol response to the beginning of a new school year. Psychoneuroendocrinology. 2002; 27(6):635–650. http://dx.doi.org/10.1016/S0306-4530(01)00031-2. [PubMed: 12084657]

Cai X, Kaiser AP, Hancock TB. Parent and teacher agreement on Child Behavior Checklist items in a sample of preschoolers from low-income and predominantly African American families. Journal of Clinical Child and Adolescent Psychology. 2004; 33(2):303–312.10.1207/s15374424jccp3302_12 [PubMed: 15136195]

Carlson MJ, Pilkauskas NV, McLanahan SS, Brooks-Gunn J. Couples as partners and parents over children's early years. Journal of Marriage and Family. 2011; 73(2):317–334.10.1111/j.1741-3737.2010.00809.x [PubMed: 21479113]

Chaudry, A. Putting children first: How low-wage working mothers manage child care. New York, NY: Russell Sage Foundation; 2004.

Chaudry, A.; Henly, JR.; Myers, M. Conceptual frameworks for child care decisionmaking. Washington, DC: U.S Department of Health and Human Services; 2010.

Claessens A, Chen J-H. Multiple child care arrangements and child well being: Early care experiences in Australia. Early Childhood Research Quarterly. 2013; 28(1):49–61. http://dx.doi.org/10.1016/j.ecresq.2012.06.003.

Coley RL, Votruba-Drzal E, Miller PL, Koury A. Timing, extent, and type of child care and children's behavioral functioning in kindergarten. Developmental Psychology. 2013; 49(10):1859–1873.10.1037/a0031251 [PubMed: 23244403]

Conger RD, Conger KJ, Elder GH, Lorenz FO, Simons RL, Whitbeck LB. A family process model of economic hardship and adjustment of early adolescent boys. Child Development. 1992; 63(3):526–541.10.1111/j.1467-8624.1992.tb01644.x [PubMed: 1600820]

NIH-PA Author Manuscript NIH-PA Author Manuscript NIH-PA Author Manuscript

Crockenberg SC. Rescuing the baby from the bathwater: How gender and temperament (may) influence how child care affects child development. Child Development. 2003; 74(4):1034–1038.10.1111/1467-8624.00585 [PubMed: 12938697]

Cryer D, Wagner-Moore L, Burchinal M, Yazejian N, Hurwitz S, Wolery M. Effects of transitions to new child care classes on infant/toddler distress and behavior. Early Childhood Research Quarterly. 2005; 20(1):37–56. http://dx.doi.org/10.1016/j.ecresq.2005.01.005.

De Schipper JC, Tavecchio LW, Van IJzendoorn MH, Linting M. The relation of flexible child care to quality of center day care and children's socio-emotional functioning: A survey and observational study. Infant Behavior and Development. 2003; 26(3):300–325. http://dx.doi.org/10.1016/S0163-6383(03)00033-X.

De Schipper JC, Tavecchio LW, Van IJzendoorn MH, Van Zeijl J. Goodness of-fit in center day care: relations of temperament, stability, and quality of care with the child's adjustment. Early Childhood Research Quarterly. 2004; 19(2):257–272. http://dx.doi.org/10.1016/j.ecresq.2004.04.004.

De Schipper JC, Van IJzendoorn MHV, Tavecchio LWC. Stability in center day care: Relations with children's well-being and problem behavior in day care. Social Development. 2004; 13(4):531–550.10.1111/j.1467-9507.2004.00282.x

Fergusson DM, Lynskey MT, Horwood LJ. The effect of maternal depression on maternal ratings of child behavior. Journal of Abnormal Child Psychology. 1993; 21(3):245–269. http://dx.doi.org/10.1007/BF00917534. [PubMed: 8335763]

Fiese BH, Tomcho TJ, Douglas M, Josephs K, Poltrock S, Baker T. A review of 50 years of research on naturally occurring family routines and rituals: Cause for celebration? Journal of Family Psychology. 2002; 16(4):381–390.10.1037/0893-3200.16.4.381 [PubMed: 12561283]

Gordon RA, Kaestner R, Korenman S. Child care and work absences: Trade-offs by type of care. Journal of Marriage and Family. 2008; 70:239–254.10.1111/j.1741-3737.2007.00475.x

Gunnar, MR. Social regulation of stress in early child development. In: McCartney, K.; Phillips, D., editors. Blackwell Handbook of Early Childhood Development. Malden, MA: Blackwell; 2006. p. 106-125.

Gunnar MR, Tout K, De Haan M, Pierce S, Stanbury K. Temperament, social competence, and adrenocortical activity in preschoolers. Developmental Psychobiology. 1997; 31(1):65–85.10.1002/(SICI)1098-2302(199707)31:1<65: :AID-DEV6>3.0.CO;2-S [PubMed: 9222117]

Henly, JR.; Lambert, S. Nonstandard work and child-care needs of low-income parents. In: Bianchi, SM.; Casper, LM.; King, BR., editors. Work, family, health, and well-being. Mahwah, NJ: Erlbaum; 2005. p. 473-492.

Henly JR, Lyons S. The negotiation of child care and employment demands among low-income parents. Journal of Social Issues. 2000; 56(4):683–706.10.1111/0022-4537.00191

Hogan AE, Scott KG, Bauer CR. The Adaptive Social Behavior Inventory (ASBI): A new assessment of social competence in high-risk three-year-olds. Journal of Psychoeducational Assessment. 1992; 10(3):230–239.10.1177/073428299201000303

Howes C, Hamilton CE. Children's relationships with child care teachers: Stability and concordance with parental attachments. Child Development. 1992; 63(4):867–878.10.1111/j.1467-8624.1992.tb01667.x [PubMed: 1505245]

Howes C, Hamilton CE. The changing experience of child care: Changes in teachers and in teacher-child relationships and children's social competence with peers. Early Childhood Research Quarterly. 1993; 8(1):15–32. http://dx.doi.org/10.1016/S0885-2006(05)80096-1.

Howes C, Hamilton CE, Matheson CC. Children's relationships with peers: Differential associations with aspects of the teacher-child relationship. Child Development. 1994; 65(1):253–263.10.1111/j.1467-8624.1994.tb00748.x [PubMed: 8131651]

Howes C, Hamilton CE, Philipsen LC. Stability and continuity of child-caregiver and child-peer relationships. Child Development. 1998; 69(2):418–426.10.1111/j.1467-8624.1998.tb06199.x [PubMed: 9586216]

Howes C, Rodning C, Galluzzo DC, Myers L. Attachment and child care: Relationships with mother and caregiver. Early Childhood Research Quarterly. 1988; 3(4):403–416. http://dx.doi.org/10.1016/0885-2006(88)90037-3.

NIH-PA Author Manuscript NIH-PA Author Manuscript NIH-PA Author Manuscript

Howes C, Stewart P. Child's play with adults, toys, and peers: An examination of family and child-care influences. Developmental Psychology. 1987; 23(3):423–430.10.1037/0012-1649.23.3.423

Kessler RC, Andrews G, Mroczek D, Ustun B, Wittchen H-U. The World Health Organization Composite International Diagnostic Interview short-form (CIDI-SF). International Journal of Methods in Psychiatric Research. 1998; 7(4):171–185.10.1002/mpr.47

Lamb, ME.; Ahnert, L. Nonparental child care: Context, concepts, correlates, and consequences. In: Renninger, AK.; Sigel, IE.; Damon, W.; Lerner, RM., editors. Handbook of Child Psychology: Child psychology in practice. 6. Vol. 4. Hoboken, NJ: Wiley; 2006. p. 950-1016.

Li-Grining CP, Coley RL. Child care experiences in low-income communities: Developmental quality and maternal views. Early Childhood Research Quarterly. 2006; 21(2):125–141. http://dx.doi.org/10.1016/j.ecresq.2006.04.001.

Loeb S, Fuller B, Kagan SL, Carrol B. Child care in poor communities: Early learning effects of type, quality, and stability. Child Development. 2004; 75(1):47–65.10.1111/j.1467-8624.2004.00653.x [PubMed: 15015674]

Lowe ED, Weisner TS. You have to push it—who's gonna raise your kids?': Situating child care and child care subsidy use in the daily routines of lower income families. Children and Youth Services Review. 2004; 26(2):143–171. http://dx.doi.org/10.1016/j.childyouth.2004.01.011.

Mathiesen KS, Tambs K. The EAS temperament questionnaire--Factor structure, age trends, reliability, and stability in a Norwegian sample. Journal of Child Psychology and Psychiatry. 1999; 40(3):431–439.10.1111/1469-7610.00460 [PubMed: 10190344]

McLoyd VC. Socioeconomic disadvantage and child development. American Psychologist. 1998; 53(2):185–204.10.1037/0003-066X.53.2.185 [PubMed: 9491747]

Meyers MK, Jordan LP. Choice and accommodation in parental child care decisions. Community Development. 2006; 37(2):53–70.10.1080/15575330609490207

Moore, KA.; Vandivere, S.; Ehrle, J. Turbulence and child well-being. Washington, DC: Urban Institute; 2000.

Morrissey TW. Multiple child-care arrangements and young children's behavioral outcomes. Child Development. 2009; 80(1):59–76.10.1111/j.1467-8624.2008.01246.x [PubMed: 19236393]

Morrissey TW. Sequence of child care type and child development: What role does peer exposure play? Early Childhood Research Quarterly. 2010; 25(1):33–50. http://dx.doi.org/10.1016/j.ecresq.2009.08.005.

Najman JM, Williams GM, Nikles J, Spence S, Bor W, O'Callaghan M, Andersen MJ, et al. Mothers' mental illness and child behavior problems: Cause-effect association or observation bias? Journal of the American Academy of Child & Adolescent Psychiatry. 2000; 39(5):592–602. http://dx.doi.org/10.1097/00004583-200005000-00013. [PubMed: 10802977]

Shonkoff, JP.; Phillips, DA., editors. From neurons to neighborhoods: The science of early childhood development. Washington, DC: National Academy Press; 2000.

NICHD Early Child Care Research Network. Early child care and self-control, compliance, and problem behavior at twenty-four and thirty-six months. Child Development. 1998; 69(4):1145–1170.10.1111/j.1467-8624.1998.tb06165.x [PubMed: 9768491]

NICHD Early Child Care Research Network. Type of child care and children's development at 54 months. Early Childhood Research Quarterly. 2004; 19(2):203–230. http://dx.doi.org/10.1016/j.ecresq.2004.04.002.

Oppenheim D, Sagi A, Lamb ME. Infant-adult attachments on the kibbutz and their relation to socioemotional development 4 years later. Developmental Psychology. 1988; 24(3):427–433.10.1037/0012-1649.24.3.427

Raikes H. Relationship duration in infant care: Time with a high-ability teacher and infant-teacher attachment. Early Childhood Research Quarterly. 1993; 8(3):309–325. http://dx.doi.org/10.1016/S0885-2006(05)80070-5.

Razza RA, Martin A, Brooks-Gunn J. Associations among family environment, sustained attention, and school readiness for low-income children. Developmental Psychology. 2010; 46(6):1528–1542.10.1037/a0020389 [PubMed: 20677860]

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Reichman NE, Teitler JO, Garfinkel I, McLanahan SS. Fragile Families: Sample and design. Children and Youth Services Review. 2001; 23(4–5):303–326. http://dx.doi.org/10.1016/S0190-7409(01)00141-4.

Rigby E, Ryan RM, Brooks-Gunn J. Child care quality in different state policy contexts. Journal of Policy Analysis and Management. 2007; 26(4):887–907.10.1002/pam.20290

Russ SJ, Herbert J, Cooper P, Gunnar MR, Goodyer I, Croudace T, Murray L. Cortisol levels in response to starting school in children at increased risk for social phobia. Psychoneuroendocrinology. 2012; 37(4):462–474. http://dx.doi.org/10.1016/j.psyneuen.2011.07.014. [PubMed: 21852051]

Ryan RM, Johnson A, Rigby E, Brooks-Gunn J. The impact of child care subsidy use on child care quality. Early Childhood Research Quarterly. 2011; 26(3):320–331. http://dx.doi.org/10.1016/j.ecresq.2010.11.004. [PubMed: 21874092]

Ryan RM, Kalil A, Leininger L. Low-income mothers' private safety nets and children's socioemotional well-being. Journal of Marriage and Family. 2009; 71:278–297.10.1111/j.1741-3737.2008.00599.x

Sameroff, A. The transactional model. In: Sameroff, A., editor. The transactional model of development: How children and contexts shape each other. Washington, DC: American Psychological Association; 2009. p. 3-21.

Scott EK, London AS, Hurst A. Instability in patchworks of child care when moving from welfare to work. Journal of Marriage and Family. 2005; 67(2):370–386.10.1111/j.0022-2445.2005.00122.x

Tran H, Weinraub M. Child care effects in context: Quality, stability, and multiplicity in nonmaternal child care arrangements during the first 15 months of life. Developmental Psychology. 2006; 42(3):566–582.10.1037/0012-1649.42.3.566 [PubMed: 16756446]

Tran H, Winsler A. Teacher and center stability and school readiness among lowincome, ethnically diverse children in subsidized, center-based child care. Children and Youth Services Review. 2011; 33(11):2241–2252. http://dx.doi.org/10.1016/j.childyouth.2011.07.008.

Usdansky ML, Wolf DA. When child care breaks down: Mothers' experiences with child care problems and resulting missed work. Journal of Family Issues. 2008; 29(9):1185–1210.10.1177/0192513X08317045

Weber, RB. Understanding parents' child care decision-making: A foundation for child care policy making. Washington, DC: U.S. Department of Health and Human Services; 2011.

Yeung WJ, Linver MR, Brooks–Gunn J. How money matters for young children's development: Parental investment and family processes. Child Development. 2002; 73(6):1861–1879.10.1111/1467-8624.t01-1-00511 [PubMed: 12487499]

Youngblade LM. Peer and teacher ratings of third- and fourth-grade children's social behavior as a function of early maternal employment. Journal of Child Psychology and Psychiatry. 2003; 44(4):477–488.10.1111/1469-7610.00138 [PubMed: 12751841]

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Research Highlights

- Survey and calendar data were used to examine the effects of child care instability.
- Long-term instability was associated with more externalizing behavior problems.
- Back-up arrangements were associated with more internalizing behavior problems.
- Current multiplicity, but not stable multiplicity, predicted more behavior problems.

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

Early Child Res Q. Author manuscript; available in PMC 2015 January 27.

Table 1

Instability and multiplicity measures (at 3-year wave)

	Mean (*SD*) or %	Definition
Survey measures (*N*=1637)		
Long-term instability		
Number of changes between birth and age 3	1.2 (1.6)	Total number of arrangement changes between 0-3 years. Summed mother-reported child care changes reported at 1-year and 3-year surveys.
2+ changes between birth and age 3	31.1%	2+ child care changes between 0-3 years (Yes/No).
Current back-up arrangements at age 3	28.5%	Use of back-up arrangement(s) within the past month at 3-year survey (Yes/No).
Current multiplicity at age 3	14.0%	Currently using 2+ concurrent arrangements at 3-year survey (Yes/No).
Calendar measures (*N*=1105)		
Long-term instability		
Number of transitions between birth and age 3	1.9 (.98)	Total number of transitions between 0-3 years. Constructed using the start and end dates of arrangements reported in the child care calendar at the 3-year in-home interview.
2+ changes between birth and age 3	23.8%	3+ child care transitions between 0-3 years (Yes/No).
Stable multiplicity	7.5%	Experienced 2+ concurrent arrangements for 6+ months between 0-3 years (Yes/No). Constructed using the start and end dates of arrangements reported in the child care calendar at the 3-year in-home interview.

Source: Fragile Families and Child Well-Being Study (FFCWS) 1-Year and 3-Year Wave Mother Surveys and 3-Year In-Home Interview

Note: Results are unweighted.

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

Table 2

Pairwise correlations among instability and multiplicity measures (at 3-year wave)

	1	2	3	4	5
Survey variables					
1. Long-term instability	—				
2. Current back-up arrangements	.13***	—			
3. Current multiplicity	.13***	.13***	—		
Calendar Variables					
4. Long-term instability	.31***	.06^	.08**	—	
5. Stable multiplicity	.03	.00	.14***	.14***	—

Source: Fragile Families and Child Well-Being Study (FFCWS) 1-Year and 3-Year Wave Mother Surveys and 3-Year In-Home Interview

Note: Results are unweighted. *N*=1637 for rows 1-3; *N*=1105 for rows 4-5.

^ *p*<.10;

** *p*<.01;

*** *p*<.001

Early Child Res Q. Author manuscript; available in PMC 2015 January 27.

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

Table 3

Sample descriptive statistics (Mean (SD) or %)

	Survey Sample	Calendar Sample
Children's Behavioral Outcomes at Age 3		
CBCL Internalizing Problems	9.21 (5.78)	9.44 (5.83)*
CBCL Externalizing Problems	9.49 (5.80)	9.80 (5.91)**
ASBI Prosocial Behaviors	15.54 (2.52)	15.57 (2.46)
Covariates		
Child's gender is male	52.72	51.40
Child had low birth weight	10.33	9.68
Child's age (at 3-year wave)	35.15 (2.09)	35.20 (2.09)
Child temperament (at 1-year wave)	2.56 (.75)	2.59 (.77)**
Mother's age	24.93 (5.93)	24.72 (5.68)*
Mother's race/ethnicity		
White, Non-Hispanic	22.35	20.27**
Black, Non-Hispanic	54.03	56.97**
Hispanic	20.31	19.68
Other	3.31	3.27
Mother is immigrant	10.38	8.86**
Mother interviewed in Spanish	3.71	3.11
Mother's level of education		
Less than high school degree	25.72	25.71
High school degree or equivalent	32.71	34.17^
Some college or technical school	29.65	29.53
College or graduate degree	11.92	10.59*
Family structure		
Married	22.54	20.36**
Cohabitating	33.84	34.66
Visiting	29.57	30.59
Single	14.05	14.39
Number of adults in the household	2.28 (.99)	2.27 (1.00)
Number of children in the household	1.15 (1.24)	1.19 (1.25)*
Family income as % of FPL		
0-49%	15.21	15.29
50-99%	14.60	15.38
100-199%	26.63	27.15
200-299%	17.10	17.65
300% +	26.45	24.52*
Maternal depression (at 3-year wave)	21.23	21.77
Use of non-parental care at 1-year wave	57.42	59.01

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

	Survey Sample	Calendar Sample
Primary child care arrangement (at 3-year wave)		
Center-based care	48.97	51.04*
Family child care home/non-relative	11.61	11.95
Relative	39.42	36.11*
Maternal employment status (at 3-year wave)		
Not working	24.93	22.81**
Part-time (<30 hours/week)	10.16	10.53
Full-time (30-40 hours/week)	52.00	54.05*
More than 40 hours/week	12.91	12.61
Total weekly hours in child care (at 3-year wave)		
Part-time (20 hours or less)	28.18	26.24*
Full-time (21-40 hours)	58.30	59.59
More than 40 hours/week	13.52	14.17
Family structure change (between birth and 3-year wave)	26.46	26.35
Ever poor (at baseline, 1-year or 3-year waves)	54.37	57.10**
Number of observations	1637	1105

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

Notes: All covariates were measured at baseline unless indicated otherwise. We conducted *t-tests* to test for mean differences on all variables between the observations included in the calendar sample and those not included. Results are unweighted.

^ $p<.10$;

* $p<.05$;

** $p<.01$

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

Early Child Res Q. Author manuscript; available in PMC 2015 January 27.

Table 4

Predicting mother-reported child behavior outcomes at age 3 years using survey measures

	Internalizing Problems		Externalizing Problems		Prosocial Behaviors	
	Model 1	2	1	2	1	2
	B (SE)	*B (SE)*	*B (SE)*	*B (SE)*	*B (SE)*	*B (SE)*
Survey measures						
Long-term instability	.01 (.02)	.01 (.02)	.05 (.02)**	.05 (.02)**	.01 (.02)	-.00 (.02)
Current back-up arrangements	.11 (.05)*	.01 (.06)	.05 (.05)	.03 (.06)	-.06 (.05)	-.02 (.07)
Current multiplicity	.16 (.07)*	.09 (.08)	.22 (.07)**	.18 (.09)*	-.01 (.07)	.13 (.09)
Covariates						
Child gender (male)	.13 (.05)**	.07 (.06)	.17 (.05)***	.17 (.06)**	-.19 (.05)***	-.07 (.06)
Child low birth weight	.12 (.08)	.16 (.09)^	.11 (.08)	.19 (.10)^	-.08 (.08)	-.12 (10)
Child's age (at 3-year wave)	.01 (.01)	-.01 (.01)	-.02 (.01)	-.03 (.02)^	.02 (.01)^	.01 (.02)
Child temperament (at 1-year wave)	.30 (.03)***	.29 (.04)***	.27 (.03)***	.37 (.04)***	-.17 (.03)***	-.12 (.04)**
Mother's age	.00 (.00)	.00 (.01)	-.01 (.00)	-.00 (.01)	-.01 (.01)*	-.01 (.01)
Mother's race/ethnicity (ref.=White, Non- Hispanic)						
Black, Non-Hispanic	-.06 (.07)	-.11 (.08)	.01 (.07)	-.03 (.08)	-.15 (.07)*	-.11 (.09)
Hispanic	.15 (.08)^	.14 (.09)	.12 (.08)	.14 (.10)	-.11 (.08)	-.10 (.10)
Other	.34 (.14)*	-.12 (.19)	.27 (.15)^	.08 (.20)	-.26 (.15)^	-.32 (.20)
Mother is immigrant	.11 (.10)	.21 (.12)^	-.10 (.10)	-.02 (.13)	.05 (.10)	.02 (.13)
Mother interviewed in Spanish	-.22 (.15)	-.36 (.19)^	-.22 (.15)	-.37 (.20)^	-.19 (.15)	-.33 (.21)
Mother's level of education (ref.=High school degree)						
Less than high school degree	.10 (.06)	.10 (.08)	.04 (.06)	.01 (.09)	-.22 (.07)**	-.09 (.09)
Some college	-.22 (.06)***	-.17 (.07)*	-.10 (.06)	.01 (.08)	.14 (.06)*	.18 (.08)*
College/graduate degree	-.30 (.10)**	-.21 (.11)^	-.14 (.10)	-.07 (.12)	.09 (.10)	.09 (.12)
Family structure (ref.=Married)						
Cohabitating	.05 (.07)	.10 (.09)	.01 (.08)	.07 (.09)	.07 (.08)	.09 (.10)
Visiting	.05 (.08)	.08 (.10)	-.07 (.08)	-.05 (.10)	.05 (.09)	-.03 (.11)
Other relationship	.09 (.09)	.15 (.11)	-.00 (.09)	.10 (.11)	-.07 (.09)	-.07 (.12)

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

	Internalizing Problems		Externalizing Problems		Prosocial Behaviors	
	Model 1	2	1	2	1	2
	B (SE)	*B (SE)*	*B (SE)*	*B (SE)*	*B (SE)*	*B (SE)*
Number of adults in the household	.02 (.02)	.03 (.03)	-.02 (.03)	.03 (.03)	-.05 (.03)*	-.06 (.03)
Number of children in the household	.02 (.02)	.02 (.03)	.04 (.02)^	.04 (.03)	-.02 (.02)	-.02 (.03)
Family income as % of FPL (ref.=300%+)						
0-49% FPL	.35 (.10)***	.29 (.13)*	.22 (.10)*	.31 (.14)*	-.26 (.11)*	-41 (.15)**
50-99%	.12 (.10)	.01 (.12)	.09 (.10)	.09 (.13)	-.27 (.10)**	-.20 (.13)
100-199%	.17 (.07)*	.15 (.09)^	.11 (.08)	.11 (.10)	-.17 (.08)*	-.15 (.10)
200-299%	.01 (.08)	.06 (.09)	.06 (.08)	.12 (.09)	-.10 (.08)	-.10 (.10)
Maternal depression (at 3-year wave)	.30 (.06)***	.23 (.07)**	.36 (.06)***	.31 (.08)***	-.05 (.06)	-.01 (.08)
Use of non-parental care at 1-year wave	-.06 (.05)	—	-.03 (.05)	—	.12 (.05)*	—
Primary child care arrangement (at 3-year wave; ref.=Relative)						
Center-based care	-.16 (.05)**	-.15 (.06)*	-.19 (.05)***	-.11 (.07)^	.12 (.05)*	.19 (.07)**
Family child care home/non-relative	-.10 (.08)	-.11 (.09)	-.04 (.08)	.06 (.10)	-.01 (.08)	.05 (.10)
Maternal employment status (at 3-year wave; ref.=Not working)						
Part-time (<30 hours/week)	-.10 (.09)	.08 (.12)	-.02 (.09)	.06 (.13)	.10 (.09)	-.14 (.13)
Full-time (30-40 hours/week)	-.08 (.06)	.10 (.08)	-.08 (.06)	.03 (.08)	.04 (.06)	-.14 (.09)
More than 40 hours/week	-.01 (.08)	.13 (.10)	.01 (.08)	.09 (.11)	.06 (.09)	-.13 (.11)
Weekly hours in child care (at 3-year wave; ref.=Full-time, 21-40)						
Part-time (20 hours or less)	-.03 (.06)	-.06 (.08)	-.05 (.06)	-.08 (.08)	.03 (.06)	.03 (.08)
More than 40 hours/week	.06 (.07)	.11 (.08)	.16 (.07)*	.29 (.08)**	-.02 (.07)	.03 (.09)
Family structure change	-.06 (.06)	-.04 (.07)	-.07 (.06)	-.09 (.07)	-.04 (.06)	-.08 (.08)
Ever poor	.09 (.07)	.19 (.08)*	.08 (.07)	.12 (.09)	-.00 (.07)	.02 (.09)
Constant	-1.33 (.43)**	-.94 (55)^	-.11 (.45)	-.48 (.60)	.32 (.46)	.78 (.61)
R^2	0.20	0.20	0.16	0.20	0.11	0.09
Number of observations	1637	906	1637	906	1636	905

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

Notes: All outcome variables are standardized. Results are unweighted. Model 1 includes all children in survey sample; Model 2 is restricted to children in the survey sample who were in non-parental care at the one-year wave.

Early Child Res Q. Author manuscript; available in PMC 2015 January 27.

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

ˆ $p<.10$;

* $p<.05$;

** $p<.01$;

*** $p<.001$

NIH-PA Author Manuscript NIH-PA Author Manuscript NIH-PA Author Manuscript

Table 5

Predicting mother-reported child behavior outcomes at age 3 years using calendar measures

	Internalizing Problems		Externalizing Problems		Prosocial Behaviors	
	Model 1	2	1	2	1	2
	B (SE)	*B (SE)*	*B (SE)*	*B (SE)*	*B (SE)*	*B (SE)*
Calendar measures						
Long-term instability	.04 (.03)	.03 (.04)	.09 (.03)**	.11 (.04)**	.04 (.03)	.01 (.04)
Stable multiplicity	.01 (.11)	-.02 (.13)	.05 (.11)	-.02 (.14)	.07 (.11)	.02 (.13)
Covariates						
Child gender (male)	.15 (.06)**	.07 (.07)	.20 (.06)**	.19 (.07)**	-.19 (.06)**	-.05 (.07)
Child low birth weight	.11 (.10)	.11 (.12)	.13 (.10)	.26 (.13)*	-.02 (.10)	-.08 (.12)
Child's age (at 3-year wave)	.01 (.01)	-.01 (.02)	-.01 (.01)	-.03 (.02)	.02 (.01)^	.01 (.02)
Child temperament (at 1-year wave)	.30 (.04)***	.31 (.05)***	.27 (.04)***	.36 (.05)***	-.18 (.04)***	-.09 (.05)^
Mother's age	.00 (.01)	.00 (.01)	-.01 (.01)	-.00 (.01)	-.01 (.01)	-.01 (.01)^
Mother's race/ethnicity (ref.=White, Non-Hispanic)						
Black, Non-Hispanic	-.15 (.08)^	-.18 (.10)^	.00 (.09)	.02 (.10)	-.15 (.08)^	-.14 (.10)
Hispanic	.07 (.10)	.00 (.12)	.10 (.10)	.11 (.13)	-.12 (.10)	-.15 (.12)
Other	.18 (.18)	-.32 (.23)	.11 (.19)	.12 (.25)	-.48 (.19)**	-.48 (.24)*
Mother is immigrant	.11 (.12)	.21 (.15)	-.10 (.13)	.00 (.16)	.19 (.13)	.24 (.16)
Mother interviewed in Spanish	.03 (.19)	-.16 (.24)	-.11 (.20)	-.30 (.26)	-.39 (.19)*	-.58 (.25)*
Mother's level of education (ref.=High school degree)						
Less than high school degree	.12 (.08)	.15 (.10)	.01 (.08)	-.03 (.11)	-.16 (.08)*	-.00 (.10)
Some college	-.25 (.07)**	-.16 (.09)^	-.08 (.08)	.07 (.09)	.12 (.07)^	.18 (.09)^
College/graduate degree	-.32 (.13)**	-.19 (.14)	-.10 (.13)	.02 (.15)	.11 (.13)	.08 (.14)
Family structure (ref.=Married)						
Cohabitating	.05 (.09)	.10 (.11)	.03 (.10)	.08 (.12)	.07 (.10)	-.02 (.11)
Visiting	.05 (.10)	.10 (.12)	-.07 (.10)	-.04 (.13)	.05 (.10)	-.03 (.12)
Other relationship	.11 (.11)	.14 (.13)	.02 (.12)	.10 (.14)	-.10 (.11)	-.09 (.14)
Number of adults in the household	.02 (.03)	.04 (.04)	-.05 (.03)	.00 (.04)	-.07 (.03)*	-.07 (.04)

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

	Internalizing Problems		Externalizing Problems		Prosocial Behaviors	
	Model 1	2	1	2	1	2
	B (SE)	*B (SE)*	*B (SE)*	*B (SE)*	*B (SE)*	*B (SE)*
Number of children in the household	.03 (.02)	.03 (.03)	.06 (.03)*	.08 (.03)*	-.02 (.03)	-.03 (.03)
Family income as % of FPL (ref.=300%+)						
0-49% FPL	.42 (.12)**	.37 (.17)*	.18 (.13)	.23 (.18)	-.41 (.13)**	-.55 (.17)**
50-99%	.05 (.12)	-.01 (.15)	-.04 (.12)	.03 (.16)	-.41 (.12)**	-.37 (.15)*
100-199%	.19 (.09)*	.18 (.11)	.08 (.10)	.08 (.12)	-.20 (.10)*	-.16 (.12)
200-299%	.03 (.09)	.06 (.11)	.02 (.10)	.08 (.12)	-.22 (.10)*	-.15 (.11)
Maternal depression (at 3-year wave)	.29 (.07)***	.26 (.08)**	.36 (.07)***	.35 (.09)***	-.04 (.07)	-.06 (.09)
Use of non-parental care at 1-year wave	-.01 (.06)	—	.01 (.06)	—	.11 (.06)^	—
Primary child care arrangement (at 3-year wave; ref.=Relative)						
Center-based care	-.25 (.06)***	-.23 (.08)**	-.25 (.07)***	-.17 (.08)^	.12 (.06)^	.28 (.08)**
Family child care home/non-relative	-.17 (.10)^	-.18 (.12)	-.05 (.10)	.07 (.13)	-.09 (.10)	.04 (.12)
Maternal employment status (at 3-year wave; ref.=Not working)						
Part-time (<30 hours/week)	-.10 (.11)	.01 (.14)	-.10 (.11)	.03 (.15)	.12 (.11)	-.04 (.15)
Full-time (30-40 hours/week)	-.09 (.08)	.07 (.10)	-.20 (.08)*	-.04 (.10)	.01 (.08)	-.07 (.10)
More than 40 hours/week	-.02 (.10)	.15 (.13)	-.15 (.11)	.03 (.14)	.06 (.11)	-.07 (.13)
Weekly hours in child care (at 3-year wave; ref.=Full-time, 21-40)						
Part-time (20 hours or less)	-.06 (.07)	-.05 (.10)	-.11 (.08)	-.08 (.10)	-.01 (.07)	.05 (.10)
More than 40 hours/week	.05 (.08)	.08 (.09)	.17 (.09)^	.29 (.10)**	-.10 (.09)	-.06 (.10)
Family structure change	-.06 (.07)	-.03 (.09)	-.06 (.07)	-.08 (.09)	-.03 (.07)	-.01 (.09)
Ever poor	02 (.08)	.17 (.10)	.08 (.09)	.12 (.11)	.07 (.08)	.09 (.10)
Constant	-1.19 (.54)*	-.84 (.70)	-.02 (.56)	-.46 (74)	.27 (.55)	.67 (.72)
R^2	0.21	0.23	0.16	0.21	0.12	0.11
Number of observations	1105	629	1105	629	1104	628

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

Notes: All outcome variables are standardized. Results are unweighted. Model 1 includes all children in calendar sample; Model 2 is restricted to children in the calendar sample who were in non-parental care at the one-year wave.

^ $p<.10$;

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript

* $p<.05$;

** $p<.01$;

*** $p<.001$

NIH-PA Author Manuscript
NIH-PA Author Manuscript
NIH-PA Author Manuscript

Early Child Res Q. Author manuscript; available in PMC 2015 January 27.

Table 6

Timing of instability and mother-reported child behavior outcomes at age 3 years

	Internalizing Problems	Externalizing Problems	Prosocial Behaviors
	Model 3	**3**	**3**
	B (SE)	***B (SE)***	***B (SE)***
Survey measures			
Long-term instability			
Changes between birth and age 1	.01 (.03)	.05 (.03)	-.02 (.03)
Changes between age 1 and age 3	.01 (.02)	.04 (.02)*	.03 (.02)
Back-up arrangements			
Back-up arr. at age 1	.14 (.07)*	.05 (.07)	.03 (.07)
Back-up arr. at age 3	.10 (.05)*	.05 (.05)	-.07 (.05)
Current multiplicity			
Multiplicity at age 1	-.00 (.08)	.07 (.09)	.12 (.09)
Multiplicity at age 3	.16 (.07)*	.20 (.07)**	-.03 (.07)
R^2	0.21	0.16	0.11
Number of observations	1637	1637	1636
Calendar measures			
Long-term instability			
Transitions between birth and age 1	.03 (.05)	.08 (.05)	.10 (.05)*
Transitions between age 1 and age 2	.01 (.05)	.05 (.05)	.10 (.05)*
Transitions between age 2 and age 3	.07 (.04)	.13 (.04)**	-.06 (.04)
Stable multiplicity	.01 (.11)	.05 (.11)	.07 (.11)
R^2	0.21	0.16	0.12
Number of observations	1105	1105	1104

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

Notes: All outcome variables are standardized. Model 3 includes all covariates. Results are unweighted.

* $p<.05$;

** $p<.01$;

** $p<.01$

NIH-PA Author Manuscript

NIH-PA Author Manuscript

NIH-PA Author Manuscript