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Child care and family processes: Bi-directional relations between child care quality, home environments, and maternal depression

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Abstract

The current study examined whether within-family changes in child care quality and quantity predicted subsequent changes in home environment quality and maternal depression across early childhood (6 to 54 months of age). Data were drawn from the NICHD Study of Early Child Care and Youth Development (n = 1239; 77% White; 48% female; data collection from 1991 to 1996), and were analyzed using Random Intercept Cross-Lagged Panel Models. Within-family increases in child care quality predicted modest increases in home environment quality (β = .13–.17). These effects were most robust from child age 6 to 15 months. Increases in child care quality produced small, statistically non-significant, reductions in depression. Time-specific increases in child care quantity were not consistently predictive of either outcome.

Traditionally, child care has been conceptualized as serving dual purposes: to provide enriching environments that nurture child development and to enable parental employment (Burchinal et al., 2022). In the last several decades, early child care has become increasingly prevalent (Cascio, 2021), and utilization of such care has been associated with increased maternal employment (Morrissey, 2017). Given heterogeneity in child care quality, and variability in the amount of care families access, considerable attention has been directed toward studying the effects of child care quality and quantity on child outcomes (Hong et al., 2019; Vandell et al., 2010). Perhaps surprisingly, there has been less investigation of the effects of child care quality and quantity on other important domains, such as the home environment and maternal well-being.

Indeed, child care has the potential to considerably affect the home environment and maternal well-being. Exposure to high-quality child care may provide families with examples of age-appropriate cognitive enrichment and models of emotionally supportive interactions. The hours of child care accessed may also affect the time parents spend

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SUPPORTING INFORMATION

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interacting with their child and engaging with adults. High-quality care may reduce concern parents feel about leaving their child in perceived-to-be poor-quality environments. These processes may have important effects on the home environment and maternal well-being. Yet, the current literature examining links between child care experiences and family processes leaves unanswered questions regarding how child care quality and quantity affect the home and maternal well-being.

Accurately estimating these relations also poses a serious statistical challenge. Indeed, stable environmental and individual factors likely drive both child care quality and quantity decisions and family processes, making causal inference in this area difficult. Unfortunately, traditional, widely used approaches to examining such relations (e.g., Cross-lagged Panel Models) are ill-equipped to account for these unobserved factors. As such, estimates from these models may, in fact, capture the association between influential stable factors, likely inflating the observed effects of child care measures on family processes (see discussion in Berry & Willoughby, 2017). Examining how within-family changes in child care affect family processes, apart from these stable factors, may produce more theoretically interpretable and causally relevant results (Brick & Bailey, 2020; Rohrer & Murayama, 2021).

In this paper, we used the National Institute of Child Health and Human Development's Study of Early Child Care and Youth Development (SECCYD) to investigate the relations among child care quality and quantity and two family processes: home environment quality and maternal depression. We used Random Intercept Cross-Lagged Panel Models (RI-CLPMs), which disaggregate within-and between-family effects, to examine bi-directional relations between our child care and family process measures over the course of early childhood (from 6 to 54 months of age). We then employed a host of sensitivity tests to internally replicate our findings across a set of alternative models.

Dual purpose of child care

One of the primary goals of child care has been to nurture early child development. As such, a large body of research has investigated child care quality as an important predictor of child development. This work has generally found that higher-quality care is associated with positive developmental outcomes in the short- and long-term (Hong et al., 2019; Vandell et al., 2010, 2016). These effects appear to be somewhat conditional on time spent in care. Indeed, at high quantities (i.e., more than 30 h a week), child care has been associated with increased behavioral problems (Gupta & Simonsen, 2010; NICHD ECCRN, 2002). Child care quality has been shown to build upon home environment quality in predicting child development such that the quality of both contexts independently contributes in predicting academic and behavioral outcomes (Duncan et al., 2019). Data from the SECCYD has been particularly important in documenting these associations.

Child care can be conceptualized as a form of Early Childhood Education (i.e., ECE) alongside early educational programming (e.g., pre-k). Time spent in early educational programs has been shown to benefit school readiness, especially for children from disadvantaged contexts (Elango et al., 2016). However, the benefits of such programs often

fadeout during elementary school (Bailey et al., 2017). Quality may be a key contributor to heterogeneity in the effects of early programming (e.g., Yoshikawa et al., 2013).

A second aim of child care has been to enable employment, particularly for mothers. The accessibility, and affordability, of child care is a critical determinant of employment patterns. Increased child care access has generally been associated with increased employment (Baker et al., 2008; Herbst & Tekin, 2010; Yamaguchi et al., 2018a), although a recent meta-analysis found substantial variability in the magnitude of these effects (Morrissey, 2017).

Family processes and child care

Gaining a broader perspective on the ways that child care influences children and families will require that we move beyond commonly studied child development and employment outcomes to consider additional domains. Widely cited ecological models of development have suggested that contexts influence family interactions, behaviors, and psychological well-being (Bronfenbrenner, 1992; Coll et al., 1996). Applying these models, one can imagine how child care quality and quantity may affect family processes and family members' internal states. Although we are not the first to call for child care research to extend beyond the study of proximate child outcomes (e.g., Edwards et al., 1986), few studies to date have rigorously evaluated outcomes such as the home environment and maternal depression.

The home environment

Conceptualizations of the quality of the home environment converge on the idea that high-quality home environments provide contingent, sensitive, and responsive parenting with materials and experiences that facilitate development. The Home Observation for Measurement of the Environment (HOME) is commonly used to measure home environment quality across these process and material levels (Caldwell & Bradley, 1979). The quality of the home has been established as a critical contributor to child development across behavioral and academic domains (Linver et al., 2002).

Through various mechanisms, increased child care quality and quantity could affect home environment quality. High-quality child care could provide parents a model of caregiving and developmentally supportive materials, which they could then adopt in their homes (Clarke-Stewart & Allhusen, 2005). By relieving parents', and particularly mothers', loads, it is also possible that higher quantities of child care could reduce stress, which may otherwise lead to lower-quality home environments (Ursache et al., 2017). Likewise, higher-quality child care could reduce the distress parents may experience when using child care. Alternately, higher-quality child care may facilitate child development which, in turn, could increase the ease with which families cultivate high-quality home environments or evoke parents' engagement in more developmentally supportive interactions (see Gelber & Isen, 2013 for discussion).

Surprisingly, there has been relatively little investigation of the relations between child care and the home environment specifically. One early small-sample study found that families

with children in child care had higher-quality home environments than those who did not access care (Edwards et al., 1986). Likewise, Gelber and Isen (2013) found that Head Start receipt improved parents' engagement in cognitively stimulating activities, and Love et al. (2005) found that combined home-and center-based Early Head Start programming improved parents engagement in supportive play and child-directed book reading, but not the quality of the home environment itself. Using a regression framework and SECCYD data, Kuger et al. (2019) found that cumulative child care quality in early childhood was predictive of the home environment when children were 54 months old and in third grade. Interestingly, using a residualized change model and SECCYD data, McCartney et al. (2007) found that higher-quality child care across early childhood buffered socioeconomic disparities in school readiness and language and that improvements in the home environment across early childhood mediated this relation.

Other studies have found mixed effects on maternal sensitivity, a component of the home environment. In Japan, staggered child care rollout improved parenting quality and parenting-related knowledge, but only among mothers with low income (Yamaguchi et al., 2018b). In contrast, the introduction of universal child care in Quebec (assessed to be of relatively poor quality) led to less developmentally supportive parenting (Baker et al., 2008). Early SECCYD analyses reported that higher-quality care was associated with more maternal sensitivity, though by first grade these effects were only present for those who accessed few hours of care (NICHD ECCRN, 1999, 2003). In contrast, a more recent analysis of SECCYD data using a fixed-effects regression model, which better controls for selection factors, found that there was little relation between quality of child care and maternal sensitivity (Nomaguchi & DeMaris, 2013).

For child care quantity, original SECCYD analyses found that more hours of child care were predictive of higher maternal sensitivity among Black and Hispanic families, and slightly lower sensitivity among White families (NICHD ECCRN, 2003). In a recent analysis using a Norwegian sample, however, earlier entry into child care, presumably also an indicator of child care quantity overtime, was unrelated to quality of mother–child and father–child interaction when analyzed using an instrumental variables approach (Zachrisson et al., 2021). Nomaguchi and DeMaris' (2013) re-analysis of SECCYD data also found little relation between child care quality and maternal sensitivity. Taken together, it is apparent that new statistically rigorous work is needed to clarify the relations between child care quality, quantity, and the home environment.

Maternal depression

Child care may also influence the quality of the home environment through changes in maternal well-being. Whereas perceiving to have low-quality child care options and arrangements could spur worry and depressive symptoms among mothers (Jackson, 1997; Johnson & Padilla, 2019), higher-quality environments might lead to peace of mind. Child care may also free up capacity for managing other areas of life or engaging in mental-health-promoting activities such as spending time with other adults. Indeed, social supports have been linked with less depressive symptoms (Wang et al., 2011). Child care itself may provide a socially supportive network (Shpancer, 2002). Child care could also have positive

effects on maternal well-being through enabling employment. Of note, some studies have found links between maternal employment and lower stress and depression levels (Turner, 2007).

A few studies have directly investigated the relation between child care receipt and maternal well-being. Using data from the SECCYD, Gordon et al. (2011) tested the associations between child care quality and maternal depression, measures of which were aggregated across child ages 6 to 36 months. They found that child care quality was not associated with maternal depressive symptoms. In Japan, high-quality child care roll out improved maternal reports of well-being and stress (Yamaguchi et al., 2018b). In contrast, programs thought be of relatively poor quality were associated with increased reports of depression, anxiety, and parenting stress (Baker et al., 2008; Herbst & Tekin, 2010).

Current study

The extent to which child care quality and quantity is related to home environment quality and maternal mental health remains unclear. A major complication of investigating these relations is that stable, latent factors may influence selection into various types and quantities of child care, and family processes (i.e., home environment quality, maternal depression; see Dearing et al., 2004; Duncan et al., 2004; McCartney et al., 2006, 2007 for discussion). As an illustration, consider family income. Higher levels of family income are likely to have strong effects on both child care and maternal depression. More income may lead to lower levels of depression, and income may also enable access to higher-quality child care environments. Past work using SECCYD data has shown strong associations between income and maternal depression across early childhood (Dearing et al., 2004). As such, it is of critical concern that observed correlations between child care quality and maternal depression, for example, are not simply reflecting the effects of income on both domains. Moreover, home environment quality and maternal depression themselves could also drive child care selection (Duncan et al., 2004). Thus, employing causally relevant approaches to addressing these research questions presents a serious methodological challenge. Indeed, a central goal of examining these relations is to determine statistical estimates that are relevant to policy discussions surrounding the likely effects of directing resources toward increasing child care quality and quantity. In the current study, we attempted to improve our understanding of the relations between features of child care and family processes by examining *within-family* associations. Essentially, our approach examines how within-family changes in, say, child care quality, affect subsequent within-family changes in maternal depression.

Our approach to examining bi-directional within-family effects relied on the recently developed Random Intercept Cross-Lagged Panel Model (RI-CLPM; Hamaker et al., 2015). RI-CLPMs extend the commonly used CLPM, which has become the standard approach to modeling longitudinal bi-directional relations in Developmental Psychology. The RI-CLPM disaggregates between-and within-family effects, allowing for estimation of cross-lagged effects within a given child or family (Hamaker et al., 2015; see also Berry & Willoughby, 2017). As such, estimates from our models capture how deviations from a family's expected child care quality and quantity at one assessment point predict deviations from their

expected home environment and maternal mental health at the subsequent assessment point, having parsed out the influence of stable variation in child care and family processes over time (see Hamaker et al., 2015 for details). The model also provides estimates of the extent to which these domains are related at the stable, latent, level longitudinally (i.e., between-family effects). Of note, our use of the term "within-family" differs from studies that use the term to describe analyses that compare differences between siblings (i.e., "family fixed effects"). Instead, the RI-CLPM disaggregates between- and within-unit variation. In our analyses, the unit of analysis was both the child and the mother (or family), as some variables were measured directly for the child (e.g., child care quality) while others were measured directly for the mother (e.g., maternal depression). Still others reflect combined experiences between the child and their family (e.g., home environment quality).

Ideally, this approach yields within-family estimates that are not biased by stable factors that may otherwise drive observed associations among variables of interest (e.g., family income). This approach has become more popular in recent years due to its' potential for providing more causally informative estimates, and it has been compared to "fixed effects" models commonly seen in econometrics (see discussion in Rohrer & Murayama, 2021). Brick and Bailey (2020) argued that when applied to longitudinal data, the within-subject components of the RI-CLPM provide estimates more in line with experimental designs, helping researchers project what effects might be expected following exogenous increases in a given domain at one point in time. In our setting, the disaggregation of between- and within-family effects allowed us to better evaluate what effects might be expected due to a one-time increase in either child care quality or quantity on subsequent family processes once the influence of stable factors have been accounted for. Of course, it should be noted that time-varying omitted variables can still bias the within-family paths estimated in such models (as can time-varying effects of stable variables; see Rohrer & Murayama, 2021), and previous work using SECCYD data has shown that within-unit variations in income are associated with both maternal depression and the home environment (Dearing & Taylor, 2007; Dearing et al., 2004). As noted in the method section, we assessed the sensitivity of our key results to the possibility of time-varying confounding due to changes in family income.

Finally, the RI-CLPM approach can be particularly instructive in determining whether the nature of the relations between child and family processes varies across development. Although we did not have specific a priori hypotheses about developmental differences in these relations, one could predict that associations might differ across various stages of early childhood. For example, higher-quality child care could be particularly potent in reducing maternal distress during very early childhood if mothers are more worried about leaving their young infant in child care. Furthermore, the home environment may be more responsive to influences from child care settings during infancy, when families are still settling into parenting and child care routines. Consequently, we did not constrain the model's cross-lagged paths to be equal across the developmental periods assessed, as we were interested in exploring whether these paths may differ across early childhood.

In the current study, RI-CLPMs were used to estimate the longitudinal relations between child care quality, quantity, home environment quality, and maternal depression across early

childhood using data from the SECCYD. Thus, our study aimed to answer two research questions: (1) Do within-family increases in child care quality or quantity predict subsequent within-family increases in the quality of the home environment? (2) Do within-family increases in child care quality or quantity predict subsequent improvements in maternal depression? Although we hypothesized that there would be substantive associations between changes in child care quality and quantity and these outcomes, and determined our preferred analytic model before performing analyses, we did not have firm a priori hypotheses about the direction of these associations. We considered theoretical reasons why increases in child care quantity, for example, could be related to both increases or decreases in home environment quality and maternal depressive symptoms. Of note, we were generally *less* equivocal about the hypothesized relation between child care quality and these outcomes, expecting that increases would likely be related to more desirable outcomes. With that said, we still imagined theoretical reasons why this might not be the case (e.g., if increases in child care quality prompted mothers to work more with negative repercussions for depressive symptoms and bandwidth to cultivate high-quality home environments). Given the richness of the SECCYD, and the lack of clarity from research in this area, we then extended these primary exploratory analyses to perform additional exploratory analyses to examine potential mechanisms. Specifically, we tested if child care quality and quantity predicted subsequent changes in maternal stress and employment.

METHODS

Data

Data for the present study were drawn from the NICHD's SECCYD. In 1991, mothers were recruited in hospitals from 10 sites in the United States (Little Rock, AR; Irvine, CA; Lawrence, KS; Boston, MA; Hickory, NC; Philadelphia, PA; Pittsburgh, PA; Charlottesville, VA; Seattle, WA; Madison, WI) after giving birth. In 24 h intervals, all women giving birth were screened. Of 8986 women screened, 3142 were excluded due to the family not speaking English, planning to move within the next 3 years, or the mother being less than 18 years old. A total of 1353 women refused to participate or could not be reached. Remaining women were randomly selected using conditional sampling to ensure socioeconomic and racial representation. Of those selected, 1364 completed the first visit when their infant was 1 month old.

Table 1 reports participant characteristics. Nearly half of the children were female (48%). At the time of their child's birth, mothers were, on average, 28.24 years old and had 14.29 years of education (31% only completed high school). Family income-to-needs ratios were generally above the poverty line ($M = 3.61$), although about 30% of sample had low income (ITN < 2.0). About 77% of children were White, 12% were Black, 5% were another race, and 6% were Hispanic.

Following the initial 1-month visit, study visits proceeded at regular intervals throughout childhood. The present study focused on 6-, 15-, 24-, 36-, and 54-month assessments. For each analysis, a unique analytic sample was created. Analytic samples were limited to participants who had at least one measure of the child care characteristic of interest (i.e., child care quality or quantity) and one measure of the outcome of interest (e.g., home

environment quality, maternal depression, etc.). Table 1 reports characteristics for 1297 children (95% of the full baseline SECCYD sample) who were present in at least one of our four key analyses (child care quality and quantity predicting the home environment and maternal depression).

Measures

Additional study measure details can be found in Supporting Information.

Child care

Quality: Centrally trained observers assessed child care quality for children spending at least 10 h in routine nonmaternal child care (e.g., center-based care, family daycare, grandparent care, etc.) per week. Observations took place over the course of two half-day sessions at the 6-, 15-, 24-, and 36-month assessments, and one half-day session at the 54-month assessment. During each of these sessions two 44-min observational cycles occurred. Observers completed two measures of child care quality using the Observation Record of the Caregiving Environment: Behavioral Frequencies (Duncan et al., 2019; NICHD ECCRN, 2000) and Quality Ratings (NICHD ECCRN, 2002; Vandell et al., 2010), which were averaged for robustness.

Behavioral frequency.: The Behavioral Frequency component measured the number of times an observer witnessed various caregiving behaviors (e.g., asking questions, speaking positively, speaking negatively, responding to the child's talk, positive physical contact, etc.) across observation cycles. At each timepoint, the frequency of each of these behaviors was summed across observation cycles, standardized, and then summed to form the composite score. Negative items were reverse scaled. Behavioral frequency composites, comprised of 8 to 14 behaviors at each assessment point, were defined by SECCYD researchers a priori and adapted based on confirmatory factor analyses. Higher scores indicated higher frequency of positive caregiving behaviors. Internal reliability was acceptable (α = .76–.81) across timepoints.

Quality ratings.: Observers completed Quality Ratings by rating caregiving quality across several domains (e.g., sensitivity/responsivity to distress, stimulation of development, detachment/disengagement, positive regard for the child) using a 4-point scale (1 = not at all, 2 = minimally, 3 = moderately, 4 = highly characteristic). Ratings for up to three caregivers per child were reported. If a child had multiple caregiver observations, the average quality scores across their caregivers was used in analyses. SECCYD researchers formed Quality Rating Composites through averaging ratings across five to seven domains, depending on the timepoint. Negative items were reverse coded. As such, higher scores reflected higher caregiving quality. Internal reliability was acceptable (α = .72–.89) across timepoints.

Quantity: Mothers reported the total number of hours of nonmaternal child care per week their child received across child care settings at ages: 6, 15, 24, 36, and 53 months. Mothers who reported receiving no care (i.e., 0 h) were included in the analyses.

Home environment—The HOME Inventory (Caldwell & Bradley, 1979) was used to measure home environment quality at 6, 15, 36, and 54 months of child age. The HOME is an in-home observer-based measure of the quality of the home environment including the availability of resources to support development (e.g., toys, books, etc.), provision of developmentally supportive parenting behaviors (e.g., responsivity, cognitive stimulation, etc.), and conditions of the environment (e.g., safety, organization). HOME scores were based on both observer report and parent-report (in cases when the observers were unable to observe a particular behavior or home characteristic). The 44-item Infant/Toddler version of the HOME was used at 6 and 15 months (validated for children ages 0 months to 3 years). This version was comprised of 6 subscales: Responsivity, Acceptance, Organization, Learning Materials, Involvement, and Variety. The 55-item Early Childhood version was used at 36 and 54 months (validated for children ages 3 to 6 years) and included nine subscales: Learning Materials, Language Stimulation, Physical Environment, Responsivity, Academic Stimulation, Modeling, Variety, and Acceptance. Of note, at 54 months, all items of the Learning Materials scale were asked via questionnaire (not observation). At all timepoints, the parenting behavior or home characteristic was either endorsed or not endorsed. Endorsed items were tallied to create a total HOME score, which was used in the present study. There was adequate internal reliability ($\propto$ = .78–.87) for HOME scores at each timepoint.

In post-hoc analyses, we used item-level data to generate two HOME subscales: Cognitive Stimulation and Warmth. We began by grouping items related to cognitive stimulation (e.g., “child is encouraged to learn shapes”) and warmth (e.g., “mother’s voice conveys positive feelings about child”) for both versions of the HOME. We then used confirmatory factor analyses to test if these items loaded onto the two factors at each timepoint. Items with loadings greater than .4 were retained and averaged to form the cognitive stimulation and warmth composites. The cognitive stimulation ($\propto$ = .65–.79) and warmth ($\propto$ = .54–.78) subscales showed adequate internal reliability, and captured correlated, yet distinct, domains (r = .36–.56).

Maternal depression—Maternal depression was measured using the Center for Epidemiological Studies Depression Scale (Radloff, 1977) at child ages 6, 15, 24, 36, and 54 months. The scale included 20 depression symptoms (e.g., “I felt sad,” “I felt that everything I did was an effort”). For each item, mothers were asked to report the frequency with which they felt the symptom during the past week using a four-point scale (i.e., 0 = “rarely or none of the time,” 1 = “some or a little of the time,” 2 = “occasionally or a moderate amount of time,” and 3 = “most or all of the time”). Positively framed questions were reverse coded, and all items were summed to create a total score (higher scores indicated more symptoms). Scores of 16 and higher were considered clinically significant. The scale showed good reliability ($\propto$ = .81–.90) across timepoints.

Family characteristics—Family characteristics were included in several models as covariates. These included: child gender, child race/ethnicity, maternal age, maternal educational attainment, maternal Peabody Picture Vocabulary Test-Revised performance (as

a proxy for cognitive ability; Dunn & Dunn, 1981), and average family income (at each assessment point).

Analytic plan

Random Intercept Cross-Lagged Panel Models (Hamaker et al., 2015) were employed to test the bi-directional relations among child care characteristics and our primary outcomes of interest: the home environment and maternal depression. Separate analytic samples were formed for each analysis. Participants with data from at least one assessment point for the child care variable of interest (i.e., child care quality or quantity) and outcome variable of interest (e.g., caregiving quality and the home environment) were included in a given model (i.e., child care quality and HOME, $n = 1115$; child care quantity and HOME, $n = 1264$; child care quality and maternal depression, $n = 1134$; child care quantity and depression, $n = 1238$). Missing data within a given model was estimated using Full Information Maximum Likelihood. All continuous variables were standardized within each analytic sample prior to analyses.

In each RI-CLPM, the child care variables and outcome variables were modeled as latent random intercepts and loadings for each wave were constrained to be equal. Auto-regressive and cross-lagged paths were modeled using occasion-specific latent variables (see Hamaker et al., 2015). All analyses were performed using Mplus 8.2 (Muthén & Muthén, 1988) or Stata 16.1 (StataCorp, 2019). We adapted syntax provided by Mulder & Hamaker for the RI-CLPMs (2020; see https://www.statmodel.com/RI-CLPM.shtml). Our analytic code can be found on openICPSR (https://www.openicpsr.org/openicpsr/project/177501).

Finally, it should be noted that we performed additional secondary analyses to examine the sensitivity of our findings and to explore theoretically relevant extensions. These analyses are briefly detailed below in the results and further explicated in the Supporting Information. We performed the sensitivity analyses as tests of internal replication using models that could have been viewed as reasonable alternative approaches to the preferred models shown in the main text. Our theoretical extensions included several models that attempted to shed light on potential mechanisms for the key results. First, we explored whether specific aspects of the home environment were particularly related to child care quality. Second, given considerable past interest in maternal employment and child care, we used the RI-CLPM to test the relations between child care and mothers' work hours. Finally, we tested the relations between child care and parenting stress, a maternal mental health outcome of interest for which we had limited data (i.e., data was only available for three timepoints).

RESULTS

Descriptive findings

Table 1 presents descriptive statistics for key variables of interest, and Table 2 presents the correlations among these variables. Correlations among the key variables suggested that caregiving quality was consistently, statistically significantly, related to the home environment (average $r = .20$), such that higher child care quality was associated with higher-quality home environments at each wave. Depression was consistently negatively

associated with child care quality such that higher-quality child care was associated with fewer depressive symptoms (average $r = -.10$), although these associations were not consistently statistically significant (Table 2 flags correlations that were *not* statistically significant).

Child care and the home environment

Child care quality and the home environment—We began by testing relations between child care quality and the home environment using the RI-CLPM (see Figure 1; Table S3). Of note, in this model, and across all of the models presented here, the random intercept variation for the main analytic variables (i.e., child care quality, child care quantity, home environment, and maternal depression) was statistically significant. Model fit statistics indicated that the RI-CLPM fit the data well (comparative fit index [CFI] = .99, root mean square error of approximation [RMSEA] = .04). We observed moderate standardized factor loadings for child care quality ($\beta = \sim.35$, $p < .001$) and larger loadings for the home environment ($\beta = \sim.69$, $p < .001$), indicating that HOME quality had more inter-individual stability over time than ratings of child care quality. Furthermore, at the between-child level, the latent random intercepts for child care quality and home environment quality were strongly correlated ($\beta = .58$, $p < .001$), indicating that the selection factors that lead families to choose higher-quality care environments were highly related to stability in home environment quality.

When considering the time-varying components of the model, we observed several noteworthy effects. For child care quality, we observed positive, moderate, statistically significant auto-regressive paths for two of the three tested paths, indicating that occasion-specific improvements in child care quality in one period tended to predict within-family improvements in child care quality in the next period. For the quality of the home environment, we observed statistically significant auto-regressive effects for all three periods tested, with the largest path occurring between 36- and 54-month waves ($\beta = .43$, $p < .001$). These paths indicated that across the early childhood periods observed, improvements in home environment quality at one assessment were linked to further increases in home quality over time, net of any factors that cause stability in the home environment over time.

For the within-family part of the model, we found statistically significant cross-lagged paths between child care quality and the home environment quality across all timepoints ($\beta = .13–.17$, $p < .05$), indicating that higher-quality child care was predictive of subsequent improvements in home environment quality. However, we did not find that within-family changes in the home environment reliably predicted subsequent changes in child care quality, as only one of the three paths were statistically significant, and one path was negative in direction. Child care quality and home quality were significantly concurrently correlated at a small magnitude at 6 and 15 months ($\beta = .16–.18$, $p < .01$), but these associations were smaller and statistically non-significant at 36 and 54 months.

To probe whether specific aspects of the home environment were more affected by child care quality, we ran two additional RI-CLPMs to test the relations among child care quality and specific dimensions of the home environment: Cognitive Stimulation and Warmth (see Table 3). We saw similar patterns for both subdimensions of the HOME, although we found

slightly more consistent cross-lagged effects for relations between child care quality and cognitive stimulation (of the three paths, two were statistically significant, and one was marginally significant; βs ranged from .06 to .15) compared with warmth (1 out of 3 paths was marginally statistically significant; βs ranged from .01 to .08).

Child care quantity and the home environment—Next, we tested whether changes in the home environment were also driven by changes in the amount of time children spent in child care. As Table 4 reflects, we observed moderate auto-regressive effects for all three paths tested for child care quantity, suggesting that occasion-specific increases in the time spent in child care led to further increases in the next period. However, cross-lagged effects were mostly weak, as we observed only one statistically significant cross-lagged path between child care quantity and home environment quality (quantity at 6 months predicting home environment quality at 15 months: $\beta = .11$, $p < .05$). We also observed a weak correlation between the random intercepts, further indicating that child care quantity and home enivornment quality were weakly related across early childhood.

Child care and maternal depression

Child care quality and maternal depression—Next, we tested the relation between child care quality and maternal depression using the RI-CLPM (see Figure 2; Table S6). Model fit statistics indicated the RI-CLPM fit the data well (CFI = .99, RMSEA = .03). We observed large factor loadings for depression ($\beta = \sim.68$, $p < .001$), indicating that depressive symptoms showed considerably high inter-individual stability over time. At the between-child level, the correlation between the latent random intercepts for child care quality and depression suggested a relatively small relation ($\beta = -.17$, $p < .05$) between higher child care quality and lower depression across early childhood.

The time-varying aspects of the model for maternal depression suggested that there were small-to-moderate generally statistically significant auto-regressive paths for three of the four tested paths, implying that improvements in depression at one timepoint predicted future improvement. The cross-lagged paths showed small negative paths between child care quality and depression (βs ranged from −.04 to −.10), suggesting higher-quality child care was associated with fewer depressive symptoms. Importantly, only two of the paths were marginally significant ($p < .10$), and the others were not significant. Our findings were similar for depression predicting child care quality. Only one of the four paths was marginally significant (βs ranged from −.02 to −.09).

Child care quantity and maternal depression—We subsequently tested whether changes in child care quantity predicted changes in maternal depression (see Table 5). The cross-lagged paths between quantity and depression were generally small and statistically non-significant. The one statistically significant path was from 6 to 15 months, where time-specific increases in quantity of care were predictive of decreases in depressive symptoms ($\beta = -.11$, $p < .05$). However, we observed that increases in maternal depression symptoms at 6 months were also predictive of less child care quantity at 15 months ($\beta = -.09$, $p < .05$). Finally, we did not observe a strong correlation between the latent random intercepts,

suggesting that child care quantity and depression were minimally related across early childhood.

Child care, stress, and work

Because we observed largely null effects of changes in child care quality on our measure of maternal depression, and to explore possible mechanisms of the relation between child care quality and home environment quality, we subsequently investigated other aspects of maternal behavior and mental well-being. We examined whether changes in child care quality and quantity predicted changes in parenting stress and work hours (see Tables S1 and S2). These models yielded largely null cross-lagged paths between occasion-specific changes in child care quality and quantity and subsequent changes in parenting stress and work (although within-family increases in work hours were predictive of subsequent within-family increases in time spent in child care for three of the four waves).

Sensitivity checks

Several sensitivity checks were performed to examine whether alternative analytic approaches produced cross-lagged effects similar to those from the primary home environment and maternal depression models (see Tables S3–S7). Because we used a composite measure of child care quality that averaged quality ratings from two separate scales, we examined models using the two disaggregated measures of child care quality. We found positive cross-lagged effects for both child care quality measures when relating care quality to home environment quality, but results were slightly stronger and consistently statistically significant for the “behavioral frequency” measure of child care quality. Next, for our models that related child care quality to home environment quality, we tested an additional model that removed paternal care from the measure of child care quality. Results were largely consistent with those shown in Figure 1.

Additionally, we tested the sensitivity of results to our decision to use the RI-CLPM to model bi-directional relations between child care and family process measures. We began by testing two models that have been traditionally used to examine the types of bi-directional relations examined here. First, we tested a type of “residualized change” regression model with a host of family demographic covariates, and we tested “traditional” cross-lagged panel models. Overall, results from these models were similar to those from the RI-CLPMs.

Next, we also tested several extensions of the RI-CLPM (see Mulder & Hamaker, 2020). We started by adding several time invariant controls (child gender, child race/ethnicity, mother age, and mother education status) and a time-varying control for family income to the primary models. As we noted in the introduction, the within-family parameters of the RI-CLPM may still be affected by unobserved time-varying confounds. Indeed, time-varying changes in family income may be especially problematic given that fluctuations in family income could lead to changes in child care decisions and changes in family processes (see Dearing et al., 2004). Finally, other structural models have also been recently introduced as alternative approaches for disaggregating stable-and time-specific variation using longitudinal data (see Bailey et al., 2020). Thus, we also tested if our results were consistent when using a conceptually similar latent state–trait model. Importantly, these

alternative models suggested the possibility of smaller cross-lagged paths between child care quality and home environment quality from 15 to 36 months and 36 to 54 months and provided the most consistent evidence that time-specific increases in child care quality at 6 months predicted increases in home quality at 15 months.

DISCUSSION

Many studies have focused on the ways that time spent in child care, and the quality of such care, can influence child development (e.g., Vandell et al., 2016) and maternal employment (Morrissey, 2017). However, child care may have effects on other areas of children's lives. Identifying these effects may help improve our understanding of the benefits and costs of child care. The current study investigated the extent to which child care quality and quantity predicted home environment quality and maternal depression across early childhood. To address the persistent challenge of controlling for selection factors that may otherwise bias these relations, we employed RI-CLPMs to estimate whether within-family changes in child care characteristics predicted within-family changes in the home environment and maternal depression.

We found that increases in child care quality were predictive of moderate increases in home environment quality across early childhood, and most consistently from 6 to 15 months. On further investigation, we observed that this effect was primarily due to changes in home cognitive stimulation. We found that within-family increases in child care quality were less predictive of subsequent changes in maternal depressive symptoms. These associations tended to be smaller in magnitude, and none were statistically significant at the .05 level (though two paths were significant at the .10 level). Within-family fluctuations in the quantity of child care appeared to be largely unrelated to the home environment and maternal depression over time.

The RI-CLPM approach and additional robustness checks allowed us to closely examine the relation between child care quality and home environment quality. The RI-CLPM was designed to disaggregate between-family factors from within-family processes so that stable between-family factors do not bias the cross-lagged paths relating these domains over time. Indeed, the latent random intercepts for both child care quality and home environment quality were strongly related, confirming that stable factors influenced both selection into child care and home environment quality. The additional models presented in the supplement suggested that the within-family relations were strongest for the cross-lagged path between child care quality at 6 months and home environment quality at 15 months (paths for the other timepoints were not consistently observed across alternative models). Importantly, this path held consistent in a model controlling for time-varying family income. These findings broadly align with past regression-based work finding associations between child care quality and home environment quality (Kuger et al., 2019; McCartney et al., 2007), although the present study's within-family pathways clarify that the effect was strongest and most consistent during very early childhood. Given that the RI-CLPM within-family path estimates were not influenced by between-family factors, these findings contribute a new level of statistical rigor to past work investigating these relations.

The findings reported here are potentially instructive for practice given that many intensive, and quite expensive, programs have aimed to improve home environment quality, most finding relatively modest average effects (Jeong et al., 2021; Michalopoulos et al., 2019; Ryan & Padilla, 2019). Indeed, a large contingency of interventions and programs have been directed toward improving the quality of the home environment given the importance of the home for child development (Linver et al., 2002). Our findings suggest the possibility that interventions and policies directed toward improving the quality of child care could generate "spillover" improvements in home environment quality during the first year of life. Certainly, more casually relevant research is needed to replicate and extend our findings (e.g., studies with random-assignment designs).

One way that child care quality might influence home environment quality is through providing parents with models of developmentally supportive child care that they can then incorporate within the home (Clarke-Stewart & Allhusen, 2005). Parents might observe both caregiving behaviors and developmentally supportive materials within their child care environment. Although we could not directly test this hypothesis within the data, this explanation aligns with the finding that the relation between child care quality and home environment quality was most consistent between 6 to 15 months across all sensitivity tests. One can imagine that parents of infants may be looking for ideas about how to support their child's early development and have had relatively little exposure to child-centric activities as compared with parents of older children. Parents of infants may also have the most "room for growth" in home quality, before their parenting routines have become more habitual.

Interestingly, we found that changes in child care quality were slightly more predictive of changes in the cognitive stimulation dimension of the home environment than the warmth and emotional support dimension. Past work has found that home cognitive stimulation is an important predictor of long-term outcomes (Orth, 2018). This finding may align with theory that child care serves as a model for parents. Indeed, during child care pick-up and drop-off time, parents may have more opportunity to observe cognitively stimulating aspects of the child care center (e.g., activities children are engaged in, materials available), than warmth and emotional support dimensions (e.g., how caregiver interacts with children when upset).

Alternately, or additionally, it is possible that child care quality might influence the home environment, and cognitive stimulation specifically, through fostering child-level changes (see Gelber & Isen, 2013). For example, higher-quality child care might facilitate children's development of skills that make it easier for parents to create higher-quality home environments. Higher-quality child care could also increase children's interest in cognitively stimulating activities and developmentally supportive materials, which could then provoke changes in parents' behaviors and the home environments they create.

In addition to improving home environment quality, we hypothesized that higher-quality child care could also affect maternal depression, a plausible mechanism by which child care quality could affect the home environment. Our analyses showed that increases in child care quality were predictive of only small reductions in maternal depressive symptoms, and that these effects were inconsistent and marginally statistically significant at best. These findings suggest that depression may not be particularly susceptible to changes on the

basis of improvements in child care quality alone, an explanation which aligns with our finding that maternal depression was fairly stable throughout early childhood, and past work documenting genetic contributions to depression (e.g., Levinson, 2006). Follow-up supplemental analyses exploring a, presumably, more-modifiable component of mental health, parenting stress, also showed no evidence of child care quality effects. These findings align with past work finding no relation between child care quality and depression (Gordon et al., 2011), and contradict other studies demonstrating that child care access may only have positive benefits on maternal mental health when it is high quality (Herbst & Tekin, 2010; Yamaguchi et al., 2018b).

Interestingly, we found that child care quantity was not consistently predictive of changes in the home environment or maternal depression. For the home environment, increases in child care quantity were only statistically significantly predictive of increases in the home environment from 6 to 15 months, the time at which we also consistently observed effects of child care quality on the home environment. We found a weak correlation between child care quantity and home environment quality at the latent level, suggesting limited overlap between the selection factors influencing the quantity child care families accessed and their home environment quality. Likewise, the only statistically significant cross-lagged path for child care quantity and maternal depression was from 6 to 15 months. As with the home environment, we found that at the latent level, the hours of care families accessed and maternal depression were weakly correlated.

Thus, the results for child care quantity models, and the results for models linking child care quality to HOME scores, all suggested that family processes may be most amenable to influences from time spent in child care during the earliest years of the child's life (i.e., effects were detected in the path relating child care at 6 months to the home environment at 15 months). Indeed, when children are in their first 2 years of life, parents may still be settling into routines that can be shaped by their access to high-quality child care environments. In alignment with this possibility, past experimental work has shown that parenting behaviors are malleable to intervention in the first 6-months postpartum (Dodge et al., 2014). Our findings suggest important potential for positively affecting key family processes through improving access to high-quality child care during infancy. Unfortunately, access to affordable high-quality child care during infancy and toddlerhood remains a major problem in the United States, even as access to pre-k has expanded (Chaudry & Sandstrom, 2020).

Perhaps surprisingly, follow-up analyses showed that increases in child care quantity were not predictive of increases in maternal work hours. Indeed, we did not find support for our theory that increased hours of child care could have enabled mothers to engage in mental-health promoting activities with adults, such as work, with benefits on the home environment and depression. Instead, we found that increases in work hours predicted increases in child care hours, suggesting that mothers likely sought out more care as their time at work increased.

Together, our findings suggest the importance of additional research to elucidate the relations among child care quality, quantity, and both important proximal and distal spheres

for child development. Future work may be able to address some of the limitations of the current study. Importantly, although we used a rigorous statistical model that was better poised to address confounding than typical correlational approaches, our results were still limited by our reliance on non-experimental data (see description of limitations of within-unit analytic approaches in Rohrer & Murayama, 2021). Insofar as it is possible, future work should take advantage of opportunities for quasi-experimental and experimental investigation of these questions.

It is important to note that the SECCYD data used for the current investigation was collected in the 1990s opening the possibility that the associations we explored could be different today. Yet, to our knowledge it is the only large-scale dataset available to test these associations from birth to age 5. If these relations were investigated using data collected today, it is possible that such analyses would yield smaller associations between changes in child care quality and changes in home environment quality. Indeed, access to information on child development and care has likely expanded over the past three decades. As such, parents may be less reliant on child care as a source of information on these topics and have less “room for growth” in home environment quality as a result. On the other hand, if improvements in child care quality drove improvements in home environment quality through nurturing child development in ways that made it easier for parents to cultivate high-quality home environments, then perhaps we would find similar associations today.

Importantly, the SECCYD also lacked significant racial diversity (77% White). Future work would benefit from consideration of these relations in more racially diverse samples, given how the lived realities of racism could affect the dynamics we studied (see Iruka et al., 2022). As such, the current study findings may have limited generalizability beyond the investigated sample. Additionally, the current study was limited in that we were only able to examine child care quality and quantity, not child care access itself. Additional research is needed to evaluate whether child care accessibility influences family and parent outcomes. Future work should also consider the relations between child care and well-being for all primary caregivers.

Finally, we were unable to fully test the mechanisms linking child care quality and the home environment. Future work should explicitly test whether parents report that their child care setting influenced their parenting and home environment. In light of considerable conversation regarding the benefits and costs of expanding public funding for early child care, understanding the ways in which child care influences family processes and parental well-being is critical. Future work should embrace statistically rigorous approaches to longitudinally evaluate how child care relates to family process and parental outcomes of importance. Considering the effects of these and other ECE contexts (e.g., pre-k) on broader family and parent outcomes is an exciting frontier for the field.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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The data necessary to reproduce the analyses presented are available, with approval, from ICPSR (https://www.icpsr.umich.edu/web/ICPSR/series/233). The SECCYD data details, including codebooks and, when available, measures, were carefully documented, and have been made available by ICPSR. The analytic code necessary to reproduce the analyses was adapted from a public source (https://www.statmodel.com/RI-CLPM.shtml), and are available on openICPSR (https://www.openicpsr.org/openicpsr/project/177501/). The authors would like to thank Drew Bailey and Chen Li for helpful comments on the analytic approach.

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Abbreviations:

CFI	comparative fit index
ECE	Early Childhood Education
HOME	Home Observation for Measurement of the Environment
RI-CLPMs	Random Intercept Cross-Lagged Panel Model
RMSEA	root mean square error of approximation
SECCYD	Study of Early Child Care and Youth Development

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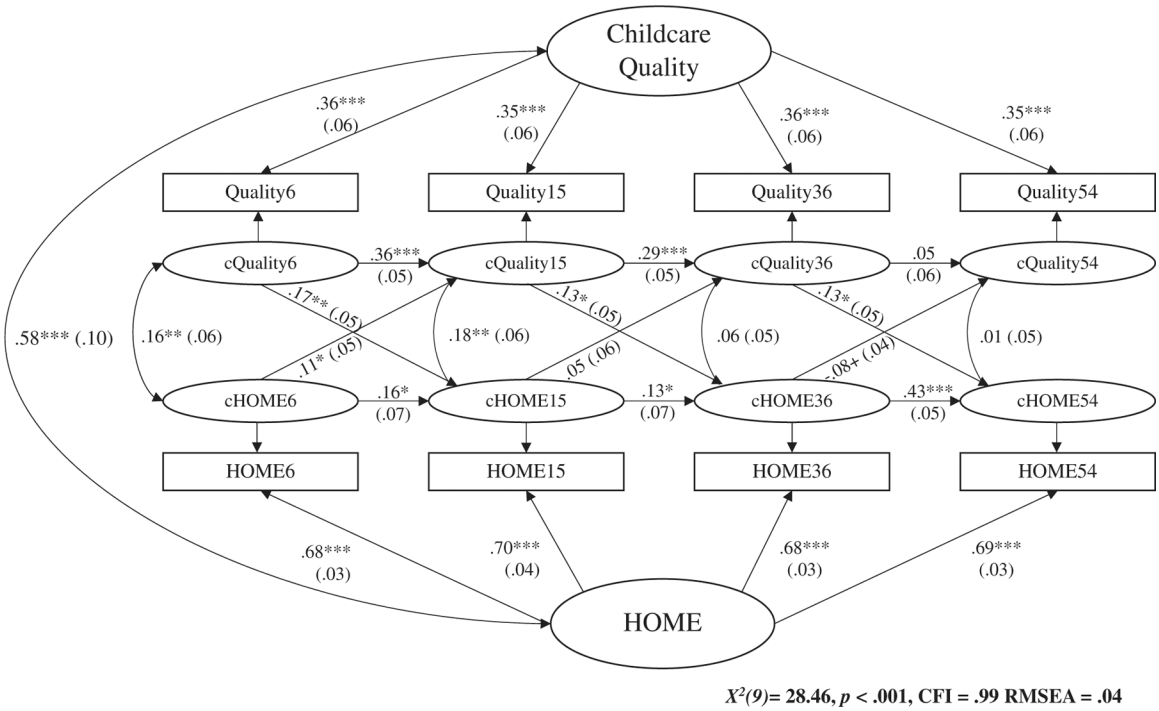

FIGURE 1.

Child care quality and home environment Random Intercept Cross-Lagged Panel Model (RI-CLPM). $^{+}p < .10$; $*p < .05$; $**p < .01$; $***p < .001$, $n = 1115$. Standardized coefficients are presented, with standard errors in parentheses derived from the RI-CLPM. The "child care quality" measure was generated by averaging the behavioral frequencies and quality ratings.

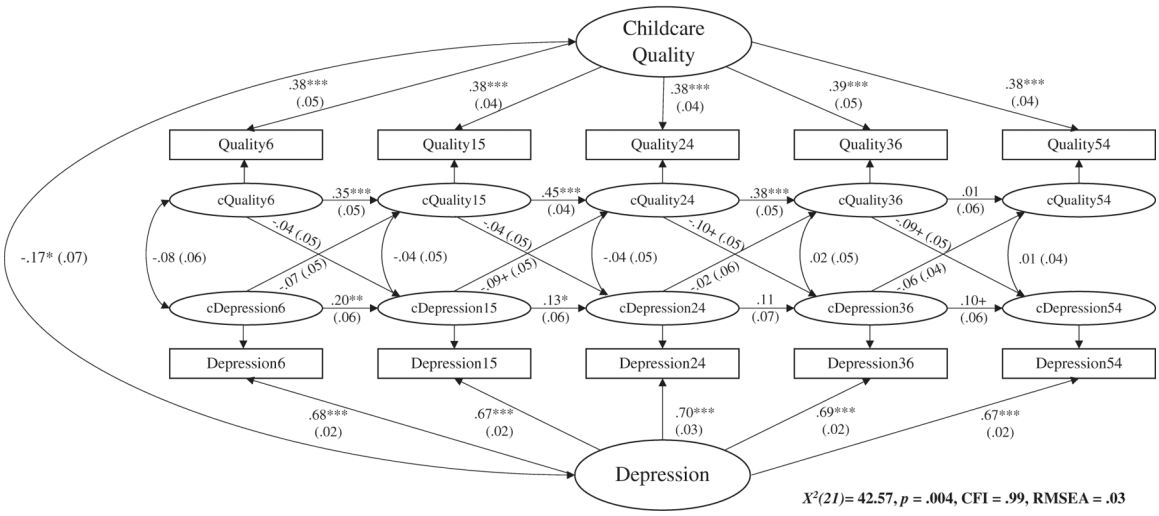

FIGURE 2.

Child care quality and depression Random Intercept Cross-Lagged Panel Model (RI-CLPM). $^{+}p < .10$; $*p < .05$; $**p < .01$; $***p < .001$, $n = 1134$. Standardized coefficients are presented, with standard errors in parentheses derived from the RI-CLPM. The "child care quality" measure was generated by averaging the behavioral frequency and quality rating measures.

TABLE 1

Descriptive characteristics

	M	SD	Minimum	Maximum	Observations
Child care quality—frequency					
6 months	0.01	2.57	−5.71	7.97	594
15 months	0.00	7.14	−17.40	29.08	658
24 months	0.00	5.78	−22.80	21.75	669
36 months	0.00	5.65	−14.49	23.93	706
54 months	0.00	5.20	−9.36	34.71	854
Child care quality—ratings					
6 months	14.72	2.87	6.00	19.75	593
15 months	14.48	2.89	6.25	20.00	656
24 months	13.85	2.79	5.33	20.00	669
36 months	19.37	3.17	10.25	27.25	707
54 months	11.80	2.13	4.50	16.00	854
Child care quantity					
6 months	22.41	20.36	0.00	99.00	1287
15 months	24.93	20.69	0.00	100.00	1259
24 months	26.13	20.33	0.00	100.00	1237
36 months	27.56	20.16	0.00	148.00	1229
53 months	32.72	19.10	0.00	119.00	1136
Depression					
6 months	8.97	8.33	0.00	52.00	1272
15 months	9.00	8.12	0.00	54.00	1236
24 months	9.40	8.63	0.00	51.00	1119
36 months	9.22	8.31	0.00	57.00	1202
54 months	9.83	8.70	0.00	55.00	1077
Home environment quality					
6 months	36.56	4.63	14.00	45.00	1272
15 months	37.32	4.68	0.00	45.00	1229
36 months	41.45	7.41	9.00	54.00	1179

	M	SD	Minimum	Maximum	Observations
54 months	46.00	5.46	18.00	55.00	1045
Demographic characteristics					
Maternal age	28.24	5.62	18.00	46.00	1297
Family income-to-needs ratios	3.61	2.85	0.15	27.36	1295
Maternal education	14.29	2.51	7.00	21.00	1297
Maternal Peabody Picture Vocabulary Test	99.01	18.35	40.00	159.00	1167
Female child	48%				1297
Child race/ethnicity					
White	77%				1297
Black	12%				1297
Other race	5%				1297
Hispanic	6%				1297

Note: Child care quality—frequency = Behavioral Frequency Scores; child care quality—ratings = Quality Ratings; child care quantity = hours of child care per week; depression = Center for Epidemiological Studies Depression Scale; home environment quality = Home Observation for Measurement of the Environment. For these descriptive statistics, the sample was limited to families included in at least one of the four key analyses (child care quality or quantity predicting the home environment or maternal depression; maximum $n = 1297$).

TABLE 2

Correlations among key analysis variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Child care quality														
1. 6 months	1													
2. 15 months	.44	1												
3. 24 months	.32	.52	1											
4. 36 months	.29	.38	.47	1										
5. 54 months	.15	.07^	.08^	.16	1									
Maternal depression														
6. 6 months	−.05^	−.07^	−.09	−.12	−.02^	1								
7. 15 months	−.04^	−.06^	−.12	−.08	−.07^	.58	1							
8. 24 months	−.04^	−.06^	−.09	−.08	−.06^	.52	.53	1						
9. 36 months	−.01^	−.07^	−.13	−.09	−.08	.47	.50	.54	1					
1. 54 months	.02^	−.05^	−.08^	−.12	−.04^	.42	.39	.50	.52	1				
Home environment quality														
11. 6 months	.20	.25	.21	.20	.08	−.24	−.20	−.21	−.17	−.18	1			
12. 15 months	.24	.30	.30	.22	.12	−.26	−.28	−.25	−.22	−.24	.58	1		
13. 36 months	.13	.26	.21	.22	.06^	−.24	−.24	−.27	−.26	−.29	.48	.56	1	
14. 54 months	.11	.26	.24	.26	.10	−.26	−.28	−.34	−.33	−.36	.49	.54	.70	1

Note: The child care quality composite (i.e., the average of the behavioral frequency and the quality rating measures) is used in this matrix. The sample was limited to families that had both at least one measure of child care quantity and one measure of child care quality.

^$p > .05$, all unmarked correlations are significant at $p < .05$, $n = 1297$.

TABLE 3

Reciprocal relations between child care quality and home environment subscales (Random-Intercept Cross-Lagged Path Model)

	Cognitive stimulation		Warmth	
	β	**SE**	***β***	**SE**
Factor loadings				
Child care quality	.34***–.35***		.34***–.35***	
HOME	.60***–.61***		.42***	
Auto-regressive paths				
cQuality6 → cQuality15	.37***	.05	.38***	.05
cQuality15 → cQuality36	.29***	.05	.30***	.05
cQuality36 → cQuality 54	.04	.06	.04	.06
cHOME6 → cHOME15	.16**	.06	.16**	.05
cHOME15 → cHOME36	.25***	.06	.17**	.05
cHOME36 → cHOME54	.33***	.05	.22***	.05
Cross-lagged paths				
cQuality6 → cHOME15	.11*	.05	.04	.05
cQuality15 → cHOME36	.15**	.05	.08+	.05
cQuality36 → cHOME54	.06	.05	.01	.05
cHOME6 → cQuality15	.09+	.05	.07	.05
cHOME15 → cQuality36	.09	.06	.03	.05
cHOME36 → cQuality 54	−.03	.05	−.02	.05
Relation between child care quality and HOME				
Quality with HOME (random intercepts)	.52***	.12	.43**	.16
cQuality6 with cHOME6	.13*	.06	.05	.05
cQuality15 with cHOME15	.18***	.05	.17***	.05
cQuality36 with cHOME36	.08	.05	.05	.04
cQuality54 with cHOME54	−.04	.04	−.09+	.05
Model fit				
RMSEA	.05		.02	
CFI	.98		.99	
Observations	1115		1115	

Note: Suffix numbers reflect child age in months at time of observation/assessment. The “Child Care Quality” measure was generated by averaging the Behavioral Frequencies and Quality Ratings.

Abbreviations: CFI, comparative fit index; HOME, Home Observation for Measurement of the Environment; RMSEA, root mean square error of approximation.

+ $p < .10$.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

TABLE 4

Reciprocal relations between child care quantity and the home environment (Random Intercept Cross-Lagged Panel Model)

	β	SE
Factor loadings		
Child care quantity	.63*** −.65***	
HOME	.69*** −.70***	
Auto-regressive paths		
cQuantity6 → cQuantity 15	.34***	.05
cQuantity15 → cQuantity36	.22**	.07
cQuantity36 → cQuantity 53	.22***	.06
cHOME6 → cHOME15	.20**	.06
cHOME15 → cHOME36	.15*	.06
cHOME36 → cHOME54	.42***	.04
Cross-lagged paths		
cQuantity6 → cHOME15	.11*	.05
cQuantity15 → cHOME36	.05	.05
cQuantity36 → cHOME54	.04	.05
cHOME6 → cQuantity 15	.03	.05
cHOME15 → cQuantity36	.07	.05
cHOME36 → cQuantity 53	−.04	.05
Relation between child care quantity and HOME		
Quantity with HOME (random intercepts)	.01	.05
cQuantity6 with cHOME6	.03	.05
cQuantity15 with cHOME15	.12*	.05
cQuantity36 with cHOME36	.00	.04
cQuantity53 with cHOME54	.03	.04
Model fit		
RMSEA	.04	
CFI	.99	
Observations	1264	

Note: Suffix numbers reflect child age in months at time of observation/assessment.

Abbreviations: CFI, comparative fit index; HOME, Home Observation for Measurement of the Environment; RMSEA, root mean square error of approximation.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

TABLE 5

Reciprocal relations between child care quantity and maternal depression (Random Intercept Cross-Lagged Panel Model)

	β	SE
Factor loadings		
Child care quantity	.67*** −.70***	
Depression	.67*** −.70***	
Auto-regressive paths		
cQuantity6 → cQuantity 15	.28***	.05
cQuantity15 → cQuantity24	.29***	.06
cQuantity24 → cQuantity36	.31***	.06
cQuantity36 → cQuantity 53	.17**	.06
cDepression6 → cDepression15	.22***	.06
cDepression15 → cDepression24	.11+	.06
cDepression24 → cDepression36	.08	.07
cDepression36 → cDepression54	.11+	.06
Cross-lagged paths		
cQuantity6 → cDepression15	−.11*	.04
cQuantity15 → cDepression24	.06	.06
cQuantity24 → cDepression36	.02	.05
cQuantity36 → cDepression54	.07	.05
cDepression6 → cQuantity15	−.09*	.04
cDepression15 → cQuantity24	−.05	.05
cDepression24 → cQuantity36	.13**	.05
cDepression36 → cQuantity 53	.03	.04
Relation between child care quantity and depression		
Quantity with depression (random intercepts)	−.08+	.04
cQuantity6 with cDepression6	−.05	.05
cQuantity15 with cDepression15	−.12**	.04
cQuantity24 with cDepression24	.05	.05
cQuantity36 with cDepression36	.03	.04
cQuantity53 with cDepression54	−.03	.04
Model fit		
RMSEA	.04	
CFI	.99	
Observations	1283	

Note: Suffix numbers reflect child age in months at time of observation/assessment.

Abbreviations: CFI, comparative fit index; HOME, Home Observation for Measurement of the Environment; RMSEA, root mean square error of approximation.

+ $p < .10$

*$p < .05$;

**$p < .01$;

***$p < .001$.