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Consequences of Teen Parents' Child Care Arrangements for Mothers and Children*

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Abstract

Using the nationally representative Early Childhood Longitudinal Study-Birth Cohort (2001 - 2006; $N \approx 7900$), we examined child care arrangements among teen parents from birth through prekindergarten. Four latent classes of child care arrangements at 9, 24, and 52 months emerged: "parental care," "center care," "paid home-based care," and "free kin-based care." Disadvantaged teen-parent families were overrepresented in the "parental care" class, which was negatively associated with children's preschool reading, math, and behavior scores and mothers' socioeconomic and fertility outcomes compared to some nonparental care classes. Nonparental care did not predict any negative maternal or child outcomes, and different care arrangements had different benefits for mothers and children. Time spent in nonparental care and improved maternal outcomes contributed to children's increased scores across domains. Child care classes predicted maternal outcomes similarly in teen-parent and nonteen-parent families, but the "parental care" class predicted some disproportionately negative child outcomes for teen-parent families.

Keywords

Adolescent parents; child care; child care arrangements; early childhood; latent class analysis; life course

Improving the life outcomes of teen parents and their children is an important policy goal in the United States today, especially given that more than 1 in 6 teen girls is projected to give birth before turning 20 (Perper & Manlove, 2009). One policy measure that seems promising for simultaneously improving the situations of young mothers and their children is nonparental child care. Care situations are an important arena of socialization during early childhood, a period of tremendous cognitive and socioemotional growth that influences later development (Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001). In the first four years of life, cognitive, behavioral, and health disparities between the children of teen parents and their peers take root and intensify (Mollborn & Dennis, in press), and policy dollars invested in early childhood programs, such as child care, pay off handsomely in improved outcomes throughout the life course (Duncan, Ludwig, & Magnuson, 2007). If early child care predicts more positive outcomes for teen parents' children than for their peers, then policies supporting it may be able to prevent developmental disparities from taking root. Yet little is known about the nonparental care situations experienced by these children and their consequences. The benefits of local programs providing center-based care for teen mothers and their children have been documented. But even in the broader child

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care literature, the implications of other common types, including home-based and kin-based care, are less clear. We contribute to the literature by analyzing recent, nationally representative longitudinal data to investigate the consequences of a variety of care arrangements for children of teen parents and their mothers.

Understanding how child care arrangements influence the children of teen parents and their families is important for both theory and policy. In the United States, many assume that the best place for a young child to learn is at home with her mother, though mounting evidence disputes this conclusion (Crosnoe, 2007; NICHD Early Child Care Research Network, 2002, 2004). Yet a life course theoretical perspective emphasizes that teen mothers are in a life stage in which education and career development are important goals. Echoing these ideas, public discourse suggests that the best place for a teenage mother to be is at school or work, as evidenced by the debate around welfare reform and the resulting restrictions on underage mothers' activities (Schott, 2009). Hence, parenting teens often face a normative double bind, seen as failed mothers if they use nonparental care, but failed adults if they stay home instead of studying or working. By investigating which choices are best for young mothers and children, we hope to disentangle facts from stereotypes, informing social policies.

We examined five types of parental and nonparental child care at three points in time, using latent class analyses to determine the prevalent types of care arrangements among teen-parent families throughout early childhood. Descriptive analyses incorporated a wide variety of variables representing the characteristics of families who used different care arrangements and the characteristics of care settings. Multivariate regressions examined how predominant care arrangements predicted children's early reading, math, and behavior scores at age 4½, just before the transition to school. Similar analyses predicted changes in mothers' socioeconomic outcomes (educational attainment, work status, and household income) and their subsequent childbearing. Finally, we assessed whether care situations had different consequences for teen parents' children and their mothers than for children of nonteen parents and their mothers.

BACKGROUND

Nonparental Care in Early Childhood

Nonparental care is common in early childhood in the United States, but its costs are typically high and types of care vary considerably in their advantages and disadvantages (Scott, London, & Hurst, 2005). In 2009, 60 percent of 3- to 5-year-olds were enrolled in preschool or kindergarten (Kids Count, 2010). Many children received other nonparental care, such as paid or unpaid care in a home. The average annual cost of full-time child care ranged from $3,550 to $18,750 in 2009 (NACCRRA, 2010). Although some low-income families qualify for child care assistance, many states have long waiting lists, and most states' programs have not improved since 2001 (Schulman & Blank, 2010). High costs and limited governmental assistance make it difficult for lower-income families, including the vast majority of teen parents, to obtain high-quality nonparental care. A lack of reliable, affordable child care has been identified as a key barrier to young families' socioeconomic success (Teitler, Reichman, & Neponmyaschy, 2004).

What do young parents do if center-based care is out of financial reach? Families supported by generous assistance programs tend to choose center care, but if support is less available, they choose home-based care provided by kin or nonkin (Crosby, Gennetian, & Hudson, 2005). Kin-based care is frequently more affordable, but also more unstable and unreliable, than center care (Teitler *et al.*, 2004). Teen parents may also rely disproportionately on kin-based care to compensate for their own lower parenting quality (Contreras *et al.*, 1999; Gordon, Chase-Lansdale, & Brooks-Gunn, 2004) or because family members offer to help.

Grandmothers are more likely to provide child care for younger teen mothers and those receiving less support from the baby's father (Voran & Phillips, 1993). But because of increases in women's labor force participation (England, Garcia-Beaulieu, & Ross, 2004), kin-based child care has become less available in many families (Brewster & Padavic, 2002). When family members are not available to provide child care, young parents (especially mothers) may have no option but to stay at home and provide care themselves, rather than engaging in the age-normative activities of attending school or working for pay.

The prevalence of different types of care and their consequences for children vary substantially by the child's age (Leibowitz, Waite, & Witsberger, 1988). Most literature has focused on the year or two preceding kindergarten rather than on earlier child care, about which less is known. Our study identified predominant configurations of care arrangements throughout the first 4½ years of life, making unique contributions to the literature by examining a variety of care arrangements among teen parents' children and tracking them across early childhood.

Consequences of Early Child Care for Teen-Parent Families Child outcomes

Our first research question was: Are child care arrangements related to the outcomes of teen parents' children and their mothers? Research has found that child care is an important arena of socialization that affects children's development (Crosnoe, 2007; NICHD Early Child Care Research Network, 2002, 2004). On one hand, time spent in child care is associated with behavior problems in the general population before and after starting kindergarten (Crosnoe, 2007; NICHD Early Child Care Research Network, 2002). On the other hand, preschool or center care is associated with short-term cognitive gains (Magnuson, Ruhm, & Waldfogel, 2007; NICHD Early Child Care Research Network, 2002) that last until the transition to formal schooling and are then translated into long-term educational advantages (Entwisle, Alexander, & Olson, 2004). Many poor and minority children, groups from which teen parents' children disproportionately come, benefit more from preschool than their more advantaged peers (Magnuson, Ruhm, & Waldfogel, 2007), although less is known about the effects of noncenter care arrangements. Because children's development changes rapidly during the first years of life, it is important not to assume that findings about the developmental effects of prekindergarten care apply universally.

Research on the consequences of noncenter care for children of teen parents is very sparse. Studying teen mothers in a welfare program, Yoshikawa, Rosman and Hsueh (2001) found that children from families with low levels of nonparental child care and maternal work and school involvement had lower school readiness scores than those in a variety of other care situations. Our research addresses gaps in the literature by analyzing a nationally representative sample and isolating the consequences of different types of child care arrangements.

In contrast to observational studies, research evaluating randomized interventions can better estimate the impact of care on children. Programs for teen parents often combine center care with other services, preventing researchers from isolating the effects of child care. For example, Campbell, Breitmayer, and Ramey (1986) found that a high-risk teenage mother program providing center care, free health care, and transportation improved preschool cognitive scores. Other interventions that included teen mothers and bundled child care with other services found cognitive and educational gains for children (Clewell, Brooks-Gunn, and Benasich, 1989; Ramey et al., 2000) that persisted into young adulthood and also lowered the likelihood of teen pregnancy (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002).

An association between child care and family outcomes in our observational data may have two possible causes. First, the selection of families with different characteristics into different care arrangements may result in a spurious association between care arrangements and outcomes. For example, bias may result from the selection of families with higher incomes or better parenting skills into higher-quality care settings (NICHD Early Child Care Research Network, 2004). Our analyses adjust for selection factors to better isolate the causal effect of child care. We anticipate that both selection and child care itself contribute to a positive relationship between nonparental care and child and maternal outcomes among teen parents' children. We expect that all types of nonparental care will improve cognitive scores among children of teen parents compared to parental care: Teen mothers' typically lower-quality parenting (Contreras *et al.*, 1999; Gordon, Chase-Lansdale, & Brooks-Gunn, 2004) may mean their children receive higher-quality care when others provide it. Because of differences in quality and reliability described above, we expect center care will be more consistently associated with positive child outcomes than other types of nonparental care.

Maternal outcomes—Child care also has the potential to affect maternal outcomes because it frees up the mother's time for work or school, and socioeconomic improvements for mothers could translate into advantages for children. Research about the implications of child care for teen mothers' outcomes is more extensive than for those of children. A lack of nonparental care has been identified in qualitative research as a barrier to teenage mothers' educational attainment (SmithBattle, 2007). Kin-based care has been positively associated with young mothers' educational and employment outcomes (Gordon, *et al.*, 2004; Unger & Cooley, 1992), though other research has found that it decreased paid work involvement (Voran & Phillips, 1993). Intervention programs for teenage mothers that included center care and other resources improved their high school attendance and grade point averages, high school completion, and postsecondary enrollment and longer-term educational attainment, employment, and financial independence (Campbell *et al.*, 1986, 2002; Crean, Hightower, & Allan, 2001; Williams & Sadler, 2001; see Clewell *et al.*, 1989 for a review). Access to center care has also been associated with a decrease in teen mothers' likelihood of experiencing repeat childbirths (Sadler et al., 2007; Williams & Sadler, 2001). Although the reasons for this have not been documented, mothers with available child care may be better able to work or attend school, motivating them to avoid or postpone subsequent childbearing. We therefore expect nonparental care arrangements to predict improvements in mothers' socioeconomic outcomes and reduced subsequent childbearing.

Consequences of Child Care for Teen-Parent Families Versus Others

Our second research question asks: Are nonparental child care arrangements more positively related to outcomes among teenage parents' children and their mothers than among other families? Extant literature has not compared the consequences of child care arrangements for teen-parent versus nonteen-parent families. Accurately comparing these two groups is difficult because teen parents come from much more disadvantaged segments of the population than older parents do (Geronimus & Korenman, 1992). This selection results in teen-parent families having negative life outcomes that may be a consequence of social disadvantage rather than early childbearing (Turley, 2003). Socioeconomic disadvantage may also result in differential selection into child care arrangements for teen parents versus others, so analyses comparing the consequences of child care for teen and older parents must account for selection.

Because they tend to come from low-income and minority populations for whom nonparental care is disproportionately beneficial and because teenagers should pursue education or employment to improve later socioeconomic outcomes, mothers and children in teen-parent families may benefit more from nonparental care than their nonteen-parent

families. Teenage mothers are in a life phase when the development of human capital (education and work experience) is crucial for long-term outcomes. Women of all ages experience "motherhood penalties" in the workplace (Correll, Benard, & Paik, 2007), but disruption to the accumulation of human capital may be more problematic in adolescence than in adulthood. Longitudinal research following teen mothers over multiple decades has found that the negative short-term socioeconomic consequences of early childbearing lessen over time as young mothers regain lost educational and occupational ground (Furstenberg, 2007). At midlife, though, teen parents still lag behind their same-age peers in terms of occupational status and educational attainment (Taylor, 2009). For all these reasons, we expect that nonparental care arrangements will have significantly more positive consequences for maternal outcomes, and thereby potentially for child outcomes, in teen-parent families than in other families.

The Study

In this study we focused on children who have a teen parent of either gender, although most children who have a teen father also have a teen mother. Research using the same national survey has shown that having a teen father is associated with compromised child development (Mollborn & Lovegrove, 2011). Regardless of which parent was a teenager, we assessed maternal outcomes. The mother was almost always the child's primary parent, so her fate and the child's were closely linked. Our child outcomes, measured in the fall before most children entered kindergarten, included reading, math, and behavior scores. Academic preparedness and behavior predict success in the transition to school, which strongly influences later educational outcomes (Entwisle, Alexander, & Olson, 2004). Maternal outcomes were educational attainment, work status, and household income adjusted for household size, as well as repeat childbearing. We chose these outcomes because they have been linked to future socioeconomic success among teen mothers (Hofferth, 1987; Manlove, Mariner, & Papillo, 2004).

A variety of factors that we expected to influence selection into child care arrangements (maternal socioeconomic background, marital and socioeconomic status, and work and school involvement at the start of the measurement period; parental ages; and child age, race/ethnicity, and gender) were controlled in multivariate analyses to better isolate the consequences of child care. Parenting quality and home environment, which could also complicate the relationship between child care arrangements and child outcomes, were also controlled. We controlled for each child and maternal outcome at the start of the observation period to capture change from the initial measurement of child care to the measurement of outcomes. Finally, because children's behavior and health can shape mothers' activities and children's care arrangements and subsequent outcomes (Coley, Ribar, & Votruba-Drzal, 2011; Crosnoe, 2006), we controlled for this endogeneity using birth weight and child health and behavior at the start of the study.

METHOD

Data

The Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) followed a nationally representative sample of about 10,600 children born in 2001 from infancy through early kindergarten (U.S. Department of Education, 2007; because of ECLS-B confidentiality requirements, all *N*s are rounded to the nearest 50). It is the first nationally representative U.S. study to track children through this period of early life using parent interviews and direct assessments. Importantly, the ECLS-B included relatively large subsamples of children with a teen parent. The sample was drawn from all 2001 births registered in the National Center for Health Statistics vital statistics system based on a clustered, list frame

sampling design. Children were sampled from 96 counties and county groups. Children whose mother was younger than 15 at their birth were excluded, but these births are rare with 0.6 births per 1,000 for ages 10-14 in 2008, compared to 41.5 for ages 15-19 (Hamilton, *et al.*, 2010).

This study used data from the first three waves of the survey, conducted when the children were about 9, 24, and 52 months old. The primary parent, almost always the biological mother, was interviewed in person. The weighted response rates for the parent interview were 74, 93, and 91 percent respectively for each wave. Attrition between Waves 1 and 3 was roughly comparable for teen (20 percent) and nonteen parents (16 percent). This study's primary analysis sample was restricted to children whose biological mothers participated in the interview at all waves (reducing the full sample by about 500 cases), whose mothers' age was known and who had child care information at all waves (further reducing about 150 cases), resulting in about 8250 eligible cases in the full sample and 950 eligible cases in the teen-parent subsample of children who had at least one parent under age 20 at their birth.

We imputed missing values for all independent variables except race/ethnicity, gender, Wave 1 equivalents of child outcomes (all resulting in a reduction of 350 cases), and paternal age (for which we considered missing information to be substantively meaningful, so a "missing" category was included in analyses) using all independent variables in Stata's *ice* multiple imputation package. Outcome variables were not imputed, resulting in 7 percent of cases missing reading or math assessments and 0 percent missing behavior scores or maternal outcomes. Thus, our main analysis samples were approximately 7300 to 7350 children overall and 850 children of teen parents for reading and math analyses, and 7900 children overall and 900 children of teen parents for behavior analyses and maternal outcomes. For all analyses except the assignment of latent classes and the multiple imputation equations, Stata software accounted for complex survey design using replication and probability weights to make findings representative of U.S. children born in 2001.

Measures

Child care measures—The primary parent reported on the child's nonparental care arrangements at each wave. The array of possible child care arrangements was complex, especially because of parents' frequent use of multiple care arrangements. Considering only regular situations of at least five hours a week, we condensed information at each wave into five categories: no nonparental care, center care only, center care with other nonparental care, no-cost care provided by a relative including combinations with paid home-based care, and *paid home-based care only*. These categories were chosen to strike a balance between parsimony and meaningful representation of care types that have been a focus of previous literature (parental, center, and kin and nonkin home-based care, as well as multiple care arrangements). Descriptive analyses measured characteristics of children's care situations at each wave, including total hours per week in any nonparental care, hours per week by type of child care, and cost per month by type of child care. Finally, for a subsample of children, ECLS-B personnel conducted Wave 2 and 3 observations of the quality of children's nonparental care arrangements. For the Arnett scale total score, the primary care provider was rated on 26 items intended to capture positive relationships, punitiveness, detachment, permissiveness, and prosocial interactions.

Child outcomes—Table 1 reports descriptive statistics for these variables and others below. We examined three measures of development at Wave 3 (about age 4½), drawn from in-person child assessments and parent interviews (see Snow *et al.*, 2007 for more information about these and other measures). Children's reading scores were calculated based on a 35-item test covering areas appropriate for pre-kindergarten learning such as

phonological awareness, letter sound knowledge, letter recognition, print conventions, and word recognition. Math scores were calculated using a two-stage assessment routed after the first stage depending on the child's score, involving number sense, counting, operations, geometry, pattern understanding, and measurement. Children's behavior was represented by a standardized continuous variable, averaged from 24 items in which the parent reported how frequently the child exhibited specific behaviors, using a 5-point scale ranging from *never* to *very often* ($\alpha = 0.86$). Negative items were reverse coded, so a higher score represents better behavior. The items were taken from the Preschool and Kindergarten Behavior Scales—Second Edition, the Social Skills Rating System, and the Family and Child Experiences Study, as well as new items. For example, parents reported how often the child shares belongings or volunteers to help other children, how often the child is physically aggressive or acts impulsively, and how well the child pays attention.

Maternal outcomes—All maternal outcomes were measured at Wave 3. Socioeconomic outcomes included the mother's educational attainment with highest degree coded into approximate years, the household's income-to-needs ratio which calculated household income as a percentage of the federal poverty line (which adjusted for household size), and the mother's paid work status (*full time* at 30 hours per week or more, *part time* at 1-29 hours, or *none*). Finally, based on household rosters, we coded whether or not the mother had borne a subsequent child after the study child's birth.

Control variables—Demographic variables included maternal (*15 - 17* or *18 - 19* at the child's birth compared to > *20*) and paternal age (*15 - 19* or *20 - 24* compared to > *25*), the child's race/ethnicity (*non-Hispanic Black, Hispanic*, or *other/multiracial* compared to *non-Hispanic White*), and the child's gender. Maternal background was represented by the maternal grandmother's educational attainment (< *high school degree, some college*, or *college degree* compared to *high school degree*) and the mother's marital status at birth (*married* versus *not married*). Several Wave 1 equivalents of Wave 3 maternal outcomes were controls: maternal educational attainment and paid work status and household income-to-needs ratio. Other Wave 1 socioeconomic measures included household food security (*insecure without hunger* or *insecure with hunger* versus *secure*) and maternal school enrollment (*part-* or *full-time* versus *none*).

Two Wave 1 and three Wave 2 measures of parenting quality and home environment also served as controls. The Wave 1 Nursing Child Assessment Teaching Scale (NCATS) total score provided a direct assessment of the primary parent's parenting skills and the child's responsiveness during a learning task (Byrne & Keefe, 2003). ECLS-B staff constructed parent scores for five scales (sensitivity, negative regard, intrusiveness, stimulation of cognitive development, and detachment), which we averaged into a positive parenting scale from *1* to *7* ($\alpha = 0.64$). Interviewers' Wave 1 observations of the mother's behavior during the assessment coded a variety of behaviors such as slapping, showing affection, ensuring a safe play environment, responding verbally to the child, providing toys to the child, and interfering with the child's actions during the assessment. Eight items were coded as *0* for "negative" and *1* for "positive" parenting behaviors and were then averaged. The Wave 2 Two Bags Task involved parent and child in a videotaped play interaction. Our study used the parent rating, which assessed mothers' sensitivity, positive regard, and cognitive stimulation (Nord, *et al.*, 2006). The Wave 2 home environment score counted 21 positive factors relating to the daily activities of the child, such as watching television, visiting the library, or having family meals, with the score ranging from *0* to *21* ($\alpha = 0.72$). Finally, the child's attachment to the primary parent was assessed in Wave 2 using the Toddler Attachment Sort – 45, with the interviewer scoring the child on behaviors such as "seeks and enjoys being hugged" and "shows no fear, into everything" (coded as *insecure-avoidant, insecure-ambivalent*, or *disorganized* versus *secure*).

Three additional variables were included in analyses predicting Wave 3 child outcomes, as they were required for analyses of the age-sensitive raw math and reading scores. These measures were the child's age at Wave 3, the equivalent to the dependent variable from Wave 1 (directly assessed Wave 1 raw cognitive scores for math and reading, and the directly assessed Wave 1 Child Behavior Rating Scale for behavior), and the child's age in months at Wave 1. Finally, three variables controlled for potential endogeneity, or the effects of early child outcomes on subsequent child care arrangements. The child's birth weight was coded as low (< 2500 g) versus normal, and her Wave 1 parent-reported general health was coded as *very good/excellent* compared to *good/fair/poor*. Child behavior at Wave 1 (see above) was included in all multivariate models.

Analyses

Latent classes—Because we were interested in identifying prevalent patterns of child care arrangements across early childhood, we conducted latent class analyses using the poLCA function in R. Latent class analysis differs from factor analysis in that it uses dichotomous, not continuous, indicators and assumes that there are underlying discrete groups, or "classes," of respondents. We used a maximum iteration of 2000 and repeated the 4-group analysis with different starting values 100 times to assure a global maximum. Latent classes were created from 5 child care arrangements at each of 3 waves (see above) for three different samples: the full eligible sample ($N \approx 8250$), nonteen parents' children ($n \approx 7300$), and teen parents' children ($n \approx 950$). To determine the appropriate number of classes, we used two common fit measures, the Bayesian Information Criterion (BIC) and the Akaike Information Criterion (AIC), to compare across different solutions ranging from 1 to 6 classes. As analysis starting values were randomly generated and determined the maximization process, we took the average AIC and BIC for 30 different trials to assure that results were not determined by the starting values.

Across the three different subsamples, the AIC was nearly identical, with solutions of 4 or more classes appearing roughly similar. Thus, we considered the 4-class solution to be the most parsimonious. Considering the BIC, the full sample and nonteen parent sample were nearly identical, with 4 or more classes having roughly the same BIC and the 4-class solution performing slightly better. For the teen parent sample, the BIC's best fit was a 3-class solution, followed by a 2 and 4-class solution. As described below, the 4-class solutions comprised similar groups across the teen and adult subsamples, so we adopted it for both empirical and theoretical reasons. Across waves, the four classes represented each major category of care arrangements (parental care, center care, free kin-based care, and paid home-based care). For consistency, we used membership in the four classes derived from the full sample in our multivariate analyses. Each case was assigned a probability of membership in each class (similar to a factor loading), and population shares were calculated for each class for the teen and nonteen parent subsamples. We chose the class with the highest probability of membership and assigned it to each child. See Table A1 (Appendix) for posterior probabilities and predicted population shares.

Other analyses—Descriptive analyses calculated weighted means and bivariate significance tests comparing each of the classes on characteristics of families and child care situations and comparing teen parents' children to others. We then estimated regression models predicting first teen parents' children's Wave 3 outcomes, then their mothers' socioeconomic and childbearing outcomes, on the basis of child care latent class membership and controls. Subsequent regression analyses examined the extent to which time spent in nonparental care explained relationships between care arrangements and outcomes and the extent to which positive associations of nonparental care with maternal outcomes explained children's outcomes. Care quality ratings were not included in these

analyses because none existed for parental care and sample sizes were too small. Our final multivariate analyses used the full sample, introducing interactions between latent class membership and teen parent status to assess whether consequences of nonparental care arrangements differed between teen and nonteen-parent families.

RESULTS

Descriptive Analyses

Similar patterns of child care arrangements emerged for children of teen versus nonteen parents. See appendix table A1 for details. As expected, children tended to move from parental care in infancy to "preschool" centers at age 4½. Class 1, labeled "parental care," was composed primarily of children who were exclusively in parental care at 9 and 24 months and split between parental and center care (preschool) at 52 months. Class 2, labeled "paid home-based care," included children who most commonly were in this type of care at 9 and 24 months and were split between center care and center with other nonparental care at 52 months. Class 3, labeled "free kin-based care," included children who were primarily cared for by a relative at 9 and 24 months and split between center care and center with other nonparental care at 52 months. Class 4, labeled "center care," was comprised of children who had a variety of arrangements in infancy and primarily received center care at 24 and 52 months. Two thirds of these children were exclusively in center care at 52 months, compared to less than half of children in the other classes. Not only were child care latent classes similar for the teen and nonteen parent samples, but the proportion of respondents in each was as well. For teen and nonteen parent samples, respectively, the four classes had the following population shares: 39 and 49 percent for "parental care," 21 and 23 percent for "paid home-based care," 21 and 15 percent for "free kin-based care," and 18 and 13 percent for "center care."

Table 1 presents descriptive statistics and bivariate significance tests for the four predominant latent classes of child care arrangements among children of teen parents. The table shows that children in the "parental care" class were more disadvantaged than the other three classes on a variety of dimensions. The "parental care" class was overrepresented among children whose grandmothers' educational attainment was less than a high school degree and whose mothers had fewer years of education, no school enrollment, and no paid work hours at Wave 1. Beyond socioeconomic disadvantage, other characteristics of families in the "parental care" class are important to note. This class was underrepresented among African Americans and children whose fathers were teenagers and overrepresented among Whites. Children in the "free kin-based care" class were largely similar to other nonparental care classes, although the mother or father was less likely to be older. Parenting characteristics did not differ across child care classes, although children in the "free kin-based care" class had significantly more positive home environments than others, perhaps because of coresidence with extended kin. In sum, teen-parent families selected into child care classes in nonrandom ways, with more disadvantaged teen parents more likely to be in the "parental care" class.

Table 1's descriptive findings on child care characteristics showed that teen-parent families in the "paid home-based care" class spent substantially more money on child care than other teen parents at each wave (at Wave 2, an average of $204 per month, versus $2 to $136 per month for the other classes). Supplemental descriptive analyses found that this was not true among nonteen-parent families, among whom costs were lower for the "paid home-based care" class than the "center care" class. Wave 1 and 2 costs were lower for the "free kin-based care" class compared to "center" and "paid home-based," even though children spent a similar number of hours in nonparental child care. ECLS-B's Wave 2 ratings of child care quality were higher for teen-parent families in the "center care" class compared to other

classes. Finally, the "parental care" class had much lower Wave 3 quality ratings than any other class among teen parents. Taken together, these findings suggest that "center care" was the highest-quality class for teen-parent families, yet its average cost was low. "Paid home-based care" and "free kin-based care" contrasted sharply in cost, but not in hours or quality. Quality and cost were usually lowest for the "parental care" class.

Consequences of Child Care for Children in Teen-Parent Families

Our first research question addressed the consequences of child care arrangements for mothers and children in teen-parent families. We expected that center care arrangements would be associated with increased cognitive and behavior scores among teen parents' children compared to parental care. Descriptive analyses in Table 1 found that children in the "parental care" class had significantly lower reading, math, and behavior scores at 52 months compared to the other classes, children in the "paid home-based care" class had significantly higher reading scores than the others, and children in the "center care" class had higher reading ($p < 0.10$) and behavior scores. For each outcome, the difference in scores between the "parental care" class and the highest-scoring nonparental care class was about one third of a weighted standard deviation.

The descriptive findings discussed above illustrated that a meaningful analysis of the consequences of child care arrangements for children must account for powerful selection processes that sort children into different care arrangements. Therefore, we estimated multivariate linear regression models predicting teen parents' children's reading, math, and behavior scores at Wave 3 by their latent class membership (see Table 2). Model 1 controlled for children's and parents' ages and the Wave 1 equivalent outcome. Model 2 introduced controls that might influence the selection of children into child care arrangements, including parenting factors. We found that for reading scores, the positive association with membership in the "free kin-based" and "center care" classes was explained by parenting and by factors influencing the selection of teen parents' children into child care arrangements. With controls included, children in the "paid home-based care" class had reading scores that were 1.2 points, or 0.2 weighted standard deviations, higher than those in the "parental care" class. With controls included, children in nonparental care classes had math scores that were between 1 and 1.6 points, or about 0.2 standard deviations, higher than those in the "parental care" class ($p < 0.10$ for "free kin-based care"). The initial positive association ($p < 0.10$) between "free kin-based care" class membership and behavior was explained by controls, but behavior scores for children in the "center care" and "paid home-based care" ($p < 0.10$) classes were 0.2 to 0.3 standard deviations higher than the "parental care" class. Thus, especially for the "paid home-based care" class, our expectation of positive outcomes from nonparental care was often supported. Supplemental analyses introduced total hours of nonparental child care at each wave, finding that time spent in care explained all positive relationships between nonparental care and reading and math scores, but neither of the positive associations between nonparental care and behavior.

Consequences of Child Care for Mothers in Teen-Parent Families

Our first research question also asked whether nonparental care arrangements among children of teen parents would predict mothers' improved socioeconomic outcomes and lower likelihood of subsequent childbearing. Descriptive analyses in Table 1 show that as predicted, being in the "parental care" class compared to all others was significantly associated with problematic outcomes in each of these domains. Table 3 reports multivariate regression analyses that predicted maternal outcomes while controlling for Table 2's factors that could influence the selection of teen-parent families into child care arrangements (parenting measures were excluded). The Wave 1 equivalent of each measure was controlled in each model except for subsequent childbearing (because Wave 1 was conducted at 9

months postpartum), and the Wave 3 equivalent was the outcome. Models predicting educational attainment and income-to-needs ratios were estimated using ordinary least squares regression models, subsequent childbearing was estimated using binary logistic regression, and part-time and full-time paid work versus none was estimated using multinomial logistic regression.

In these multivariate models, membership in the "paid home-based care" ($p < 0.10$) and "free kin-based care" classes predicted increases in educational attainment of 0.2 years (0.1 standard deviations) with a variety of selection factors controlled, compared to the "parental care" class. Membership in the "paid home-based care" and "center care" classes predicted household income gains of over 20 percent of the federal poverty line compared to "parental care." Membership in the "free kin-based care" class predicted lower odds of subsequent childbearing compared to being in the "parental care" class ($p < 0.10$), and mothers in the "center care" class had 39 percent lower odds of giving birth to another child. Membership in the "paid home-based care" and "free kin-based care" classes significantly predicted part-time compared to no paid work, with each more than doubling the odds of part-time work compared to the "parental care" class. Finally, the odds of working full time at Wave 3 compared to not working for pay were between 3.2 and 4.5 times higher for mothers in the three nonparental care classes compared to "parental care." Taken together, we frequently found that nonparental care was associated with more favorable gains across waves in maternal outcomes in the socioeconomic (especially employment) and fertility domains. Although nonparental care was consistently beneficial for mothers, the three classes were roughly equal in the number of significant positive associations. Supplemental analyses found that hours of nonparental care explained most of the significant associations between nonparental care arrangements and maternal outcomes.

Did these positive associations between nonparental care and maternal outcomes explain why nonparental care was beneficial for children? The gains in socioeconomic measures and reduced fertility experienced by teen mothers in nonparental care classes might be a reason why teen parents' children also benefitted from these care arrangements. Supplemental models (not shown) introduced the Wave 3 measures of each of the maternal outcomes into the child outcome models reported in Table 2, controlling for the Wave 1 measures. The positive associations of the "paid home-based care" class with reading scores and the "center care" class with behavior scores were unchanged, but the other positive associations were partially explained (to $p < 0.10$) or in the case of the marginally significant relationship between the "kin-based care" class and math scores, fully explained. In combination with the finding that time spent in care explained the positive associations of nonparental care with children's reading and math scores, we concluded that both duration of exposure to nonparental care and its advantages for mothers played a role in understanding why nonparental child care was associated with improved development among teen parents' children.

Consequences of Child Care for Teen-Parent Families Versus Others

Our second research question asked whether nonparental care arrangements would have significantly more positive associations with child and maternal outcomes among teen-parent families compared to nonteen-parent-families. Multivariate regression models predicting each of the child and maternal outcomes using the full sample included child care classes and an indicator of whether the child was born to a teen parent, as well as interactions between these variables. The same controls were included in these models as in Tables 2 and 3 (respectively for each set of outcomes). For ease of interpretation, the results of the child outcome interaction models are shown in Figure 1. The figure displays predicted values of each outcome for a hypothetical case with the teen parent subsample's average

values for all variables except those being manipulated (child care class and teen parent status). Significance levels came from the regressions.

For reading, math, and behavior scores, Figure 1 illustrates the finding from our regression models that membership in the "paid home-based care" class compared to the "parental care" class was disproportionately beneficial for children of teen parents. The "paid home-based care" class was not significantly associated with any outcome for children of nonteen parents compared to the "parental care" class, but the hypothetical child of a teen parent in this class had 1 point higher reading and 0.9 points higher math scores than the hypothetical nonteen parents' child. The "center care" and "free kin-based care" classes were associated with significantly higher math scores compared to "parental care" for all children, but their interactions with teen parent status were not significant. In contrast, membership in the "center care" class predicted 0.3 standard deviations higher behavior scores for children of teen parents compared to their peers.

Figure 1 reveals that across the three child outcomes, children of teen parents had lower scores for each outcome when they belonged to the "parental care" class compared to the three nonparental care classes, but the same was not usually true for children of nonteen parents. Another important finding is that the "paid home-based care" and "center care" classes consistently predicted the highest scores of any class among teen parents' children. In contrast, the "paid home-based care" class usually had low scores for nonteen parents' children.

Supplemental models (not shown) analyzed interactions between child care classes and teen parent status to predict maternal outcomes. Unlike for child outcomes, each of the domains analyzed did not have significant associations ($p < 0.05$) between child care arrangements and maternal outcomes for teen-parent families compared to others. Instead, membership in nonparental care classes predicted maternal outcomes similarly for all children. In sum, we found that nonparental care classes frequently predicted significantly more positive outcomes in teen-parent compared to nonteen-parent families compared to others for children, but not mothers.

DISCUSSION

This exploratory study used recent longitudinal data from the first 4½ years of childhood in a nationally representative U.S. sample to examine the characteristics and consequences of predominant child care arrangements across early childhood among teen parents' children and compared to other children. Latent class analyses identified four prevalent classes of child care arrangements at 9 months and 2 and 4½ years: "parental care," "center care," "free kin-based care," and "paid home-based care." Results echo past research on broader samples finding that families with limited resources often avoid higher-cost care options in early childhood (Crosby, *et al.*, 2005; Teitler, *et al.*, 2004), resulting in a diversity of care settings among teen parents, and that many children migrate into center-based care settings in the prekindergarten year (Leibowitz, *et al.*, 1988). Interestingly, child care arrangements before prekindergarten age (especially at age 2) were the most salient differences across these latent classes, suggesting the importance of considering care arrangements throughout early childhood. Descriptive analyses documented the selection of teen-parent families who were more likely to have successful outcomes into nonparental care.

After controlling for selection factors, our study found that receiving various types of nonparental care was associated with modest improvements in child and maternal outcomes across a variety of domains. These findings, which supported our hypothesis, are consonant with literature on the effects of intervention programs for teen parents that include center-

based child care (e.g., Campbell, *et al.*, 2002; Clewell, *et al.*, 1989; Ramey, *et al.*, 2000), though less is known about noncenter care settings. We found that both duration of exposure to care and improvements in maternal outcomes helped explain the positive relationships between nonparental care arrangements and children's outcomes. Although we expected that center care would predict the most positive outcomes, we could not identify types of nonparental care that were consistently associated with better outcomes than others.

The relatively modest effect sizes may have to do with our inability to control for care quality because the subsample with available quality measures was too small to permit analysis by class—it is possible that higher-quality care settings might improve children's outcomes more substantially. The quality measures have faced recent criticisms, however (Zaslow, Martinez-Beck, Tout, & Halle, 2011). It is also possible that unobserved factors influencing teen parents' selection into child care may have resulted in inflated estimates of the effects of care arrangements on mothers and children.

Supporting our hypothesis, results showed that some types of nonparental care were more beneficial for children in teen-parent compared to nonteen-parent families. The "paid home-based care" class was associated with significantly more positive reading, math, and behavior scores among teen parents' children than among nonteen parents' children. Similarly, the "center care" class predicted significantly higher behavior scores for teen parents' children compared to others. Nonparental care classes had similar implications for teen and nonteen mothers' outcomes, which did not support our hypothesis.

Why was the "paid home-based care" class associated with more positive child outcomes than "parental care" among teen-parent families but not others? Our descriptive analyses found little difference in "paid home-based care" quality or time spent in care compared to other nonparental care arrangements among teen-parent families, and supplemental analyses showed that its quality was not significantly different than for nonteen-parent families in the same class. After ruling out the quality and duration of "paid home-based care," we considered two alternative explanations. First, teen-parent families in the "paid home-based care" class spent substantially more money on child care than any other class, but the same was not true of nonteen-parent families. The higher cost did not appear to translate into higher quality, but it may have captured unmeasured aspects of family resources: Teen-parent families who could afford to pay more might have passed other advantages to their children, resulting in observed positive associations with children's outcomes. Alternatively, the quality of care in the comparison group, "parental care," may have differed systematically between teen-parent and nonteen-parent families. Indeed, supplemental descriptive analyses found that Wave 2 and 3 Two Bags Task parenting quality was half a standard deviation lower ($p < 0.05$) for teen parents in the "parental care" class compared to nonteen parents in the same class. This lower-quality parental care may also help explain why any type of nonparental care tended to be more beneficial for teen parents' children than parental care.

Future qualitative and quantitative research should focus on why different types of nonparental care predicted positive outcomes for this marginalized population of families. Our findings identified three explanatory pathways: the selection of disadvantaged teen-parent families into the "parental care" class, the duration of children's exposure to nonparental care, and the positive associations between nonparental care arrangements and maternal socioeconomic and fertility outcomes. The interplay between these pathways was problematic for "parental care" families, who started out at a socioeconomic disadvantage that was later compounded by a lack of nonparental care. Data limitations prevented us from considering the quality of care settings as an additional pathway, so researchers should consider this important factor in the future. Their often lower scores on reading and math

assessments and parent-reported behavior scales in the year before kindergarten set up the children in the "parental care" class for disparities in the transition to school. Past research has shown that a lack of readiness for school has serious long-term socioeconomic consequences (Entwisle, Alexander, & Olson, 2004). Research should consider the experiences of teen parents' children and the interface between their preschool care arrangements and school experiences, during and beyond the school transition. Finally, research should examine why these young mothers did not disproportionately benefit from nonparental care arrangements compared to older mothers, even though they were in a life stage in which the ability to focus on schooling or work is critical.

The nationally representative data used in study were limited by their observational nature: We could establish time order through the use of longitudinal data, but could not document causality because families selected care settings instead of being randomized. Although we controlled for many factors influencing selection and endogeneity (i.e., child and maternal outcomes affecting subsequent care arrangements) in the multivariate models, unobserved factors may still have biased the findings. The lack of equivalent quality ratings for parental care compared to other care settings and the reliance on parent reports of child behavior were drawbacks of the otherwise good child care and child outcome measures. The data did not permit us to evaluate other supports for teen mothers besides child care that have been shown to be effective, such as in-home nurse visitation programs, and we could not distinguish between the consequences of child care provided through intervention programs for teen parents and market-based care available to everyone.

Despite these limitations, our study contributed to the literature on child care in several ways. It compared the consequences of different types of parental and nonparental child care among teen-parent families, a vulnerable population for whom child care is widely implemented as a policy intervention. The use of latent class analyses to identify prevalent care arrangements across three points throughout early childhood in this nationally representative sample illuminated the social contexts in which teen-parent families are immersing their children in the United States in the new century. Our consideration of multiple domains of outcomes for both children and mothers and the interplay between maternal and child outcomes and our comparison of teen-parent and nonteen-parent families also contributed useful knowledge. Findings provided nuanced support for the idea that child care is a promising policy intervention for teen-parent families. Nonparental care was associated with simultaneous benefits for mother and child, and the positive consequences for mothers "trickled down" to children and predicted reduced developmental disparities prior to starting school that are likely to result in long-term educational gains. The short-term educational, financial, occupational, and fertility benefits to mothers also suggested that the long-term consequences of child care provision would continue to be positive for these teen-parent families.

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APPENDIX

Table A1

Class-Conditional Response Probabilities of Four-Class Model from Latent Class Analysis (LCA) of Child Care Arrangements, for Teen-Parent Families (N ≈ 950)

	LCA Class			
Variable	**Class 1: "Parental Care"**	**Class 2: "Paid Home-Based Care"**	**Class 3: "Free Kin-Based Care"**	**Class 4: "Center Care"**
Estimated population share, subsample	39%	21%	21%	18%
Wave 1 (9 months)				
Parental care only	0.78	0.32	0.21	0.26
Center care only	0.03	0.03	0.03	0.27
Center + other	0.00	0.00	0.01	0.10
Free kin-based care	0.11	0.27	0.73	0.23
Paid home-based care	0.09	0.38	0.01	0.13
Wave 2 (2 years)				
Parental care only	0.94	0.20	0.44	0.05
Center care only	0.00	0.00	0.00	0.71
Center + other	0.00	0.06	0.00	0.09
Free kin-based care	0.00	0.19	0.56	0.11
Paid home-based care	0.06	0.55	0.00	0.05
Wave 3 (4% years)				
Parental care only	0.32	0.12	0.15	0.08
Center care only	0.49	0.33	0.32	0.67
Center + other	0.09	0.31	0.36	0.16
Free kin-based care	0.06	0.07	0.13	0.03
Paid home-based care	0.04	0.16	0.04	0.06
Estimated population share, full sample	48%	20%	17%	14%
Estimated population share, nonteen parents	49%	23%	15%	13%

Source: Early Childhood Longitudinal Study-Birth Cohort, 2001-2005. N=950.

Notes: "Paid home-based care" is any paid care taking place outside of a center.

Shaded cells indicate the most prevalent child care arrangement for each class at each wave.

Latent class analyses on the full ECLS-B sample resulted in the same 4 classes; population shares shown above.

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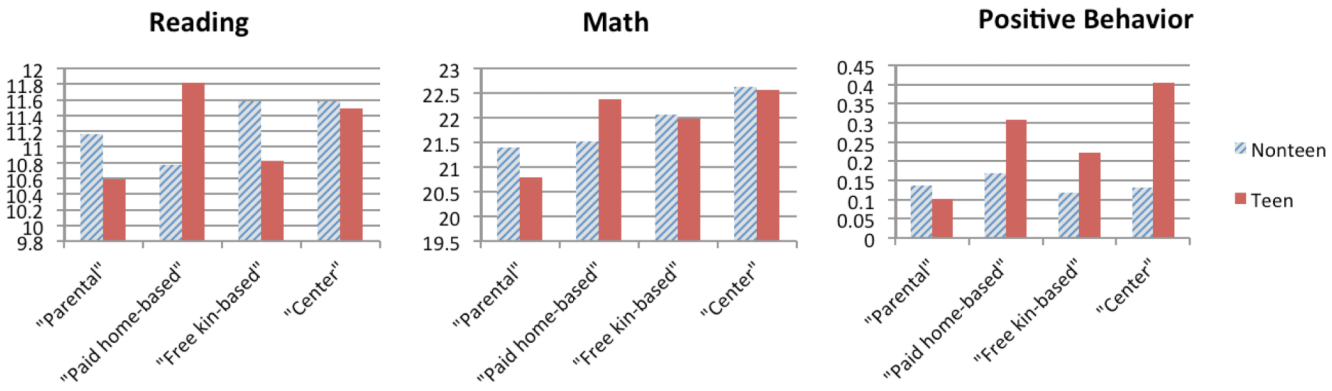

Figure 1. Predicted Wave 3 Child Outcomes for Typical Hypothetical Cases, by Teen Parent Status and Child Care Class (N ≈ 7300 reading, 7350 math, 7900 behavior)

Source: Early Childhood Longitudinal Study-Birth Cohort, 2001-2005.

Notes: Multivariate OLS regression analyses accounted for complex survey design and included the same controls as Table 2. All variables except latent class and teen parent status are set to weighted means (if continuous)/modes (if categorical) for the subsample of teen parents' children.

Table 1

Analysis Variables by Child Care Class for Teen-Parent Families: Weighted Means (N ≈ 7900, n ≈ 900 teen parents)

	Latent class (teen parents)				All Teen	All nonteen
Variable	**"Parental"**	**"Paid home-based"**	**"Free kin-based"**	**"Center"**		
Control variables						
Maternal age at birth (years)						
15-17	0.27	0.21	0.33	0.28	0.28	0.00 ***
18-19	0.66	0.59	0.62	0.64	0.63	0.00 ***
≥ 20	0.07	0.21 ***	0.05 *	0.08	0.09	1.00 ***
Paternal age at birth (years)						
15-19	0.29 **	0.49 *	0.42	0.37	0.37	0.00 ***
20-24	0.50 †	0.33 *	0.48	0.43	0.46	0.16 ***
≥ 25	0.17 †	0.15	0.08 *	0.14	0.14	0.83 ***
Missing	0.04	0.02	0.02 †	0.06	0.03	0.02 *
Child race/ethnicity						
Non-Hispanic White	0.45 **	0.36	0.31 †	0.34	0.39	0.56 ***
Non-Hispanic Black	0.19 *	0.26	0.26	0.37 **	0.24	0.13 ***
Hispanic	0.32	0.36	0.36	0.27	0.33	0.24 ***
Other	0.04	0.03	0.07 *	0.02 *	0.04	0.07 ***
Female child[a]	0.53 †	0.43	0.46	0.44	0.48	0.49
Child in very good health[a]	0.86	0.85	0.89	0.89	0.87	0.89
Low birth weight[a]	0.11	0.07 †	0.11	0.12	0.10	0.07 ***
Standardized positive behavior, Wave 1	0.19	−0.07 *	0.21	0.11	0.14	0.14
Cognitive T-score, Wave 1	50.37	50.10	49.24	50.79	50.11	50.11
Grandmother's education						
< High school	0.56 ***	0.37 *	0.38 **	0.51	0.48	0.35 ***
High school	0.26 †	0.33	0.35	0.27	0.30	0.30

Variable	Latent class (teen parents) "Parental"	"Paid home-based"	"Free kin-based"	"Center"	All Teen	All nonteen
Some college	0.10 *	0.21 *	0.17	0.13	0.14	0.14
College degree	0.08	0.10	0.10	0.09	0.09	0.21 ***
Mother married at birth[a]	0.28 *	0.28	0.19	0.10 **	0.23	0.74 ***
Mother's years of education, Wave 1	10 45 ***	11.04	11.16 **	11.26 ***	10.83	10.83 ***
Income-to-needs ratio, Wave 1	113.59	130.62	123.59	121.52	119.85	119.85 ***
Food security, Wave 1						
Insecure without hunger	0.13	0.09	0.10	0.13	0.12	0.09 †
Insecure with hunger	0.06 *	0.03	0.03	0.01 **	0.04	0.02 **
Secure	0.81 †	0.88	0.86	0.87	0.84	0.88 **
Mother's employment, Wave 1						
Full time	0.16 ***	0.50 ***	0.37 **	0.29	0.28	0.40 ***
Part time	0.09 *	0.12	0.19 *	0.15	0.13	0.15
None	0.76 ***	0.38 ***	0.44 ***	0.56	0.59	0.45 ***
Mother's school enrollment, Wave 1						
Full time	0.07 ***	0.15	0.28 **	0.36 ***	0.17	0.03 ***
Part time	0.08	0.08	0.11	0.11	0.09	0.06 **
None	0.85 ***	0.77	0.61 **	0.53 ***	0.73	0.91 ***
NCATS positive parenting, Wave 1	33.09	33.33	33.37	33.85	33.30	33.30 ***
Observed positive parenting, Wave 1	0.79	0.79	0.76 †	0.77	0.78	0.78
Positive home environment, Wave 2	11.19	11.10	11.86 **	10.77	11.28	11.28 ***
Two Bags positive parenting, Wave 2	5.35	5.46	5.38	5.46	5.39	5.39 ***
Child attachment						
Insecure-avoidant	0.16	0.21	0.19	0.13	0.17	0.16
Disorganized	0.21	0.19	0.20	0.14	0.19	0.12 ***
Insecure-ambivalent	0.08	0.10	0.07	0.16 *	0.09	0.09
Secure	0.55	0.50	0.54	0.57	0.54	0.63 ***
Maternal outcomes (Wave 3)						

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Variable	Latent class (teen parents)				All Teen	All nonteen
	"Parental"	"Paid home-based"	"Free kin-based"	"Center"		
Mother's years of education	11.03 ***	11.78 †	11.99 ***	11.94 ***	11.51	13.40 ***
Income-to-needs ratio	124.08 ***	157.06	146.55	153.36	138.84	256.80 ***
Mother's subsequent birth[a]	0.15 ***	0.03 **	0.07	0.04 *	0.10	0.04 ***
Mother's employment						
Full time	0.24 ***	0.59 ***	0.56 ***	0.55 *	0.42	0.45
Part time	0.10	0.12	0.11	0.07	0.10	0.15 **
None	0.67 ***	0.29 ***	0.33 ***	0.38 *	0.49	0.40 ***
Child outcomes (Wave 3)						
Reading T-score	45.16 **	48.22 *	46.48	48.21 †	46.40	50.59 ***
Math T-score	45.30 **	47.76	46.89	48.11	46.48	50.61 ***
Standardized positive behavior	−0.10 *	0.14	0.08	0.24 *	0.03	0.10 †
Child care characteristics						
Hours/week in nonparental child care						
Wave 1	7.27 ***	22.19 **	26.04 ***	26.91 ***	16.93	14.86 *
Wave 2	−0.29 ***	30.43 ***	25.78 ***	34.67 ***	15.76	15.34
Wave 3	17.25 ***	31.29 *	35.17 ***	31.76 *	25.87	21.99 ***
Monthly cost of nonparental child care (US dollars)						
Wave 1	21.90 **	133.81 ***	12.74 ***	81.85 *	45.56	123.16 ***
Wave 2	1.86 ***	203.78 ***	14.62 ***	136.28 ***	55.33	145.93 ***
Wave 3	38.12 **	139.45	70.25	97.72	70.25	292.80 ***
Child care total quality rating, Wave 2	59.91	58.49	57.23	62.33 *	59.31	61.86 *
Child care total quality rating, Wave 3	57.27 *	63.53 †	61.16	61.89	60.35	63.94 **

Source: Early Childhood Longitudinal Study-Birth Cohort, 2001-2005.

Notes: Analyses account for sample design.

two-tailed t-tests comparing that class to all other classes, except the rightmost column which compares teen to nonteen parents. Some variables such as child care observation ratings have smaller Ns—see text.

† p<.10

* $p<.05$

** $p<01$

[a] 1 = yes

Table 2

Summary of Hierarchical Regression Analysis for Variables Predicting Age 4½ Child Outcomes, Teen Parent Subsample (n ≈ 850 reading/ math, 900 behavior)

	Reading						Math						Positive Behavior					
	Model 1			Model 2			Model 1			Model 2			Model 1			Model 2		
Variable (ref. cat.)[a]	**B**	**SE B**	***B***	**B**	**SE B**	***B***	**B**	**SE B**	***B***	**B**	**SE B**	***B***	**B**	**SE B**	***B***	**B**	**SE B**	***B***
Centered age, W3	0.27	0.05	0.22 **	0.30	0.05	0.24 **	0.59	0.07	0.36 **	0.59	0.06	0.36 **	0.02	0.01	0.07 †	0.02	0.01	0.09 *
Wave 1 equivalent[b]	0.04	0.03	0.08	0.01	0.03	0.02	0.09	0.03	0.13 **	0.04	0.03	0.05						
Centered age, W1	−0.05	0.12	−0.02	−0.09	0.10	−0.03	0.01	0.15	0.00	−0.06	0.14	−0.02	−0.03	0.02	−0.06	−0.04	0.02	−0.07 †
Latent class (“parental”)																		
“Paid home-based”	1.85	0.57	0.13 **	1.20	0.64	0.08 *	1.78	0.76	0.09 *	1.23	0.73	0.06 *	0.24	0.13	0.09 *	0.20	0.12	0.07 †
“Free kin-based”	0.93	0.48	0.08 *	−0.02	0.55	0.00	1.53	0.64	0.09 *	1.00	0.68	0.06 †	0.18	0.11	0.08 †	0.07	0.11	0.03
“Center”	1.51	0.75	0.10 *	0.89	0.73	0.06	1.89	0.88	0.09 *	1.60	0.72	0.08 *	0.36	0.12	0.12 **	0.32	0.12	0.11 **
Mother’s age (≥ 20 years)																		
15-17	−0.70	0.82	−0.06	0.09	0.87	0.01	−1.59	1.20	−0.10	−0.10	1.14	−0.01	−0.09	0.15	−0.04	0.02	0.14	0.01
18-19	1.86	0.95	0.17 †	1.50	1.00	0.14	2.04	1.17	0.14 †	1.70	1.11	0.12	0.23	0.17	0.11	0.19	0.16	0.09
Father’s age (≥ 25 years)																		
15-19	1.06	0.92	0.10	0.06	0.90	0.01	2.10	1.01	0.15 *	1.08	1.01	0.08	0.24	0.14	0.11	0.15	0.16	0.07
20-24	0.95	0.81	0.09	0.15	0.71	0.01	0.88	0.86	0.06	−0.12	0.72	−0.01	0.26	0.15	0.13 f	0.20	0.14	0.10
Missing	2.00	1.09	0.07 †	1.20	1.06	0.04	1.89	1.32	0.05	0.65	1.21	0.02	0.24	0.18	0.04	0.13	0.18	0.02
NCATS positive parenting				0.01	0.05	0.01				0.17	0.07	0.10 *				0.02	0.01	0.07 †
Observed positive parenting				0.12	1.25	0.00				1.49	1.51	0.04				0.25	0.23	0.04
Two Bags positive parenting[c]				0.79	0.39	0.08 †				0.91	0.56	0.07				−0.01	0.10	0.00
Positive home environment[c]				0.11	0.07	0.06				0.08	0.10	0.04				0.05	0.01	0.15 **
Child attachment[c] (secure)																		
Insecure-avoidant				−0.35	0.63	−0.02				−1.62	0.76	−0.09 *				−0.23	0.12	−0.09 †

	Reading						Math						Positive Behavior					
	Model 1			Model 2			Model 1			Model 2			Model 1			Model 2		
Variable (ref. cat.)[a]	**B**	**SE B**	***B***	**B**	**SE B**	***B***	**B**	**SE B**	***B***	**B**	**SE B**	***B***	**B**	**SE B**	***B***	**B**	**SE B**	***B***
Disorganized				−0.82	0.52	−0.06				−3.25	0.60	−0.18 **				−0.20	0.11	−0.08 †
Insecure-ambivalent				−1.68	0.69	−0.09 *				−2.72	0.82	−0.11 **				−0.41	0.20	−0.12 *
Constant	5.78	1.52	**	0.34	3.93		12.17	1.76	**	0.95	5.60		−0.44	0.22	†	−2.30	0.71	**
Design-based *F*	11.39		**	8.80		**	10.73		**	8.61		**	2.74		*	6.20		**
R^2	0.12			0.25			0.22			0.36			0.05			0.19		

Source: Early Childhood Longitudinal Study-Birth Cohort, 2001-2005.

Notes: Analyses account for sample design effects.

one-tailed tests for latent classes and two-tailed otherwise

† p<.10

* p<.05

** p<01

[a] Standard control variables were included in model 2; included but not shown were race/ethnicity, child gender, health, and behavior, low birth weight, grandmother's education, mother married at birth, mother's education, income-to-needs ratio, food security, and mother's employment and school enrollment

[b] "Wave 1 equivalent" is cognitive score for reading and math, and Wave 1 behavior is included as standard control

[c] Wave 2 measure

Table 3

Summary ofLinear, Binary Logistic, and Multinomial Logistic Regression Analyses for Variables Predicting Wave 3 Maternal Outcomes, Teen Parent Subsample (n ≈ 900)

	Education			Income-to-needs ratio			New sibling[b]			Mother's paid employment[c]					
										Part-Time			Full-Time		
Variable (ref. cat.)[a]	B	SE B	*B*	B	SE B	*B*	B	SE B	*OR*	B	SE B	*OR*	B	SE B	*OR*
Mother's age (≥ 20 years)															
15-17	0.33	0.16	0.09 *	−5.79	13.14	−0.03	0.05	0.41	1.05	0.58	0.59	1.78	0.13	0.45	1.13
18-19	0.10	0.13	0.03	27.59	14.64	0.13 †	0.10	0.34	1.10	0.33	0.57	1.40	0.45	0.40	1.56
Father's age (≥ 25 years)															
15-19	0.10	0.14	0.03	−0.98	11.71	0.00	−0.02	0.33	0.98	−0.80	0.44	0.45 †	−0.42	0.32	0.66
20-24	0.07	0.14	0.02	−8.44	9.37	−0.04	0.16	0.31	1.17	−0.77	0.50	0.46	−0.19	0.32	0.83
Missing	−0.18	0.17	−0.02	8.62	19.81	0.02	−0.19	0.53	0.83	−0.23	0.68	0.79	−0.55	0.68	0.58
Latent class ("parental care")															
"Paid home-based care"	0.17	0.12	0.04 †	20.93	11.81	0.08 *	−0.34	0.31	0.71	1.04	0.50	2.82 *	1.50	0.30	4.48 **
"Free kin-based care"	0.22	0.12	0.06 *	10.52	9.30	0.05	−0.32	0.20	0.72 †	0.73	0.41	2.07 *	1.21	0.28	3.35 **
"Center care"	0.10	0.11	0.02	21.81	11.76	0.08 *	−0.49	0.25	0.61 *	−0.01	0.61	0.99	1.17	0.32	3.23 **
Mother's years of education	0.81	0.04	0.78 **	10.68	2.39	0.17 **	−0.13	0.07	0.88 †	0.12	0.13	1.13	0.14	0.08	1.15 †
Income-to-needs ratio (>200%)															
0-50% of poverty line	−0.14	0.14	−0.03	−98.25	15.26	−0.40 **	0.40	0.33	1.50	−0.52	0.57	0.59	−0.38	0.34	0.69
51-100% of poverty line	−0.20	0.14	−0.05	−73.40	15.72	−0.34 **	0.50	0.35	1.64	−0.96	0.59	0.38	−0.10	0.30	0.90
101-200% of poverty line	−0.01	0.13	0.00	−46.62	15.01	−0.22 **	0.34	0.28	1.40	−0.24	0.56	0.78	0.08	0.27	1.08
Mother's employment (none)															
Full time	0.21	0.11	0.06 †	7.93	10.13	0.04	−0.01	0.21	0.99	0.26	0.48	1.30	0.83	0.29	2.29 *
Part time	0.01	0.11	0.00	9.09	10.47	0.03	−0.02	0.31	0.98	−0.11	0.42	0.90	0.93	0.23	2.53 **
Constant	2.79	0.50	**	75.05	33.51	*	0.77	0.98		−2.46	1.85		−3.32	1.28	*
Design-Based *F*	43.46		**	8.53		**	1.93		*	3.65		**			
R^2	0.71			0.30											

Source: Early Childhood Longitudinal Study-Birth Cohort, 2001-2005.

Notes: Analyses account for sample design effects.

one-tailed tests for latent classes and two-tailed otherwise

OR = odds ratio

†p<.10

*p<.05

**p<01

[a] All variables measured at Wave 1 unless otherwise indicated. All models included the standard control variables: race/ethnicity, child female, child in very good health, low birth weight, child behavior, grandmother's education, mother married at birth, food security, and mother's school enrollment

[b] binary logistic regression compared to no additional children

[c] multinomial logistic regression compared to not working