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## Family Structure States and Transitions: Associations with Children's Wellbeing During Middle Childhood

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### Abstract

Using longitudinal data from the Maternal and Child Supplement of the National Longitudinal Survey of Youth ( $N = 3,862$ ) and Hierarchical Linear Models, we estimated associations of family structure states and transitions with children's achievement and behavior trajectories during middle childhood. Results suggest that residing in a single-mother family was associated with small increases in behavior problems and decreases in achievement, and that residing in a social-father family was associated with small increases in behavior problems. Family structure transitions, in general, were associated with increases in behavior problems and marginally associated with decreases in achievement. Transitioning to a single-mother family was associated with increases in behavior problems whereas transitioning to a social-father family was associated with decreases in reading achievement.

### Keywords

Family Structure; Middle Childhood; National Longitudinal Survey of Youth

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Most children no longer spend their entire childhood in a family that includes both of their biological parents. More than half of children under 18 will spend some time in a single-parent family and about a third will spend some time living with a social parent (a stepparent or unrelated cohabiting partner of their resident biological parent), most frequently, a social father (Bumpass, Raley, & Sweet, 1995). Children who spend their entire childhood living with their married, biological parents experience, on average, fewer academic, behavioral and social problems during both childhood and adulthood than those who spend time in other family types (Amato, 2005).

Pathways to into single- and social-parent families are diverse, however, and may result from being born to a single mother or from experiencing one or more family structure transitions. Nevertheless, most research in this area has focused on associations between family structure states and children's wellbeing, rather than on family structure transitions (Brown, 2006; Fomby & Cherlin, 2007; Hao & Xie, 2002; Osborne & McLanahan, 2007). Yet, it is possible that such transitions account for some portion of the associations between residing in single- and social-parent families and child wellbeing. Family structure transitions disrupt family relationships, necessitating considerable reorganization of family roles and increasing family stress (Hetherington, 1999). The ways in which children respond to such transitions may depend upon their developmental stage. Although a considerable number of studies explore

associations of family structure with adolescent outcomes, few examine these associations during middle childhood (Cavanaugh & Huston, 2006; Hofferth, 2006; Gibson-Davis, 2008).

This study uses longitudinal data on children from the National Longitudinal Survey of Youth (NLSY) to examine associations of family structure states and transitions with academic and behavioral development during middle childhood. First, we replicated studies that estimate associations between residing in a particular family structure and children's achievement and behavior problem trajectories. Next, we examined the separate associations between residing in and transitioning into particular family structures and children's trajectories. These analyses extend prior studies by providing a more complete understanding of the influence of both stable residence in, and transitions into, single-mother and social-father families on children's wellbeing.

## BACKGROUND

Economic, sociological, and psychological theories provide insight into how family structure may influence children. Four primary mechanisms have been proposed to explain differences in child wellbeing across family structures: economic resources, parental time and attention, family conflict and stress, and social selection (Amato, 2005). Although not exhaustive, taken together, these processes may explain why children living with both of their biological parents have higher levels of achievement and lower levels of behavior problems than other children (Carlson & Corcoran, 2001).

First, on average, two-biological-parent families have higher household incomes and more assets than other family types (McLanahan & Sandefur, 1994). Low-incomes constrain parents' ability to purchase goods and services for their children, thus reducing the quality of children's home and out-of-home environments (Duncan & Brooks-Gunn, 1997; Votruba-Drzal, 2003). Economic hardship may also increase parents' psychological distress and reduce sensitive caregiving (McLoyd, 1998). As a result, low-family incomes may adversely influence children's cognitive development and behavior (Magnuson & Votruba-Drzal, 2008; Votruba-Drzal, 2006).

Second, psychological and social control theories suggest that children in single- and social-parent families may receive less parental time, attention, supervision, and monitoring than those in two-biological-parent families (Hofferth & Anderson, 2003; Wu & Martinson, 1993). Single parents often face the dual demands of fulfilling both caregiving and breadwinning roles, which may limit the amount and quality of time they spend with their children. Even when nonresident parents share some childrearing responsibilities, they are less proximal and involved in day-to-day activities. Additionally, because the social parent family represents an "incomplete institution," social-parents face ambiguous parental roles and norms, potentially resulting in less effective parenting (Cherlin, 1978).

Third, parents and children who experience family structure transitions and, perhaps to a lesser extent, those who experience stable single- or social-parent families are likely to also experience elevated levels of family stress and conflict. Family structure transitions encompass upheaval that might engender significant stress for children, reorganization in family roles, and changes in parental employment, social support, and residence (Hetherington, 1999; Ginther & Pollak, 2004). Psychologists argue that such stress may have indirect effects on children by reducing parental warmth, support, and nurturance, thereby resulting in lower quality parent-child relationships (Cavanaugh, 2008; Thomson, Hanson, & McLanahan, 1994). The loss of parental relationships and exposure to parental conflict, in particular, may be especially difficult for children, directly affecting their sense of emotional security and psychological wellbeing (Sun & Li, 2002).

Finally, it is important to recognize that social selection may explain associations between family structure and child outcomes (Foster & Kalil, 2007). That is, these associations may reflect differences in the characteristics of the individuals residing in particular family structures as well as those who do or do not experience family structure transitions. Important maternal characteristics include age at first birth (Fomby & Cherlin, 2007), education, work hours (Manning & Brown, 2006; Manning & Lamb, 2003), and aptitude (Carlson & Corcoran, 2001; Fomby & Cherlin), as well as psychological wellbeing and risky behaviors (Brown, 2004; Carlson & Corcoran; Fomby & Cherlin). Important family factors include early family structure experiences, family size, and family income. A child's race and ethnicity, age, gender, birth order, birth weight (Carlson & Corcoran), and disability status (Reichman, Corman, & Noonan, 2004) are also potentially significant confounds (Fomby & Cherlin; Manning & Brown; Manning & Lamb). Prior research demonstrates that associations between family structure experiences and child wellbeing are considerably attenuated when such selection factors are taken into account (Aughinbaugh, Pierret, & Rothstein, 2005; Chase-Lansdale, Cherlin, & Kiernan, 1995; Ginther & Pollak, 2004).

Early research typically defined family structure in static terms, denoting whether a child lived in a single- or social-parent family at some point during childhood and comparing children across family types. On average, children in all other family types fare worse on a wide range of outcomes than those raised by both of their biological parents (Amato, 2005). These associations tend to be somewhat larger for behavioral than cognitive outcomes (Amato, 2001; McLanahan, 1997), but are generally similar for children experiencing single- and social-parent families (Amato, 2005). Research has also found that children residing with a social-parent or with both of their biological-parents fare somewhat worse in cohabiting families than in married families (Brown, 2004; Manning & Lamb, 2003).

Increasingly, however, studies have recognized that family structure is not static (Wu & Martinson, 1993). Many children observed in single- or social-parent families have experienced family structure transitions, and such family structure instability may be as important to children's healthy development as (or even more important than) the particular form a family takes (Fomby & Cherlin, 2007). Yet, observed effects of single- or social-parent family structure in many studies likely reflect both transition experiences and residence in a particular family type. Attention to the dynamic nature of family structure emphasizes that moving from one family type to another engenders considerable stress (Cavanaugh & Huston, 2006; Fomby & Cherlin). Stability in family structure—regardless of a family's form—and the accompanying continuity in caregiving, family roles, and family resources may enable families to successfully cope with stress and adapt to their new family circumstances. In contrast, experiencing family structure transitions and concomitant upheavals may hinder positive adjustment.

Early studies defined family structure transitions by changes in a mothers' marital status, with divorce or (re)marriage demarcating a family structure transition. A limitation of this approach, however, is that it overlooks transitions that result from the increasingly common experience of cohabitation (Brown, 2006). Because living arrangements may be the most salient indicators of children's experiences, scholars now tend to define family structure transitions to encompass changes in a child's household composition regardless of parental marital status (Brown, 2006; Fomby & Cherlin, 2007). Although, the term family structure transition implies a change between two states, how long the period of transition lasts before one considers the resulting family structure to be a stable family structure state remains conceptually and empirically uncertain.

Studies of family structure transitions have generally utilized three empirical approaches. The first focuses on estimating associations between prior transitions and subsequent outcomes.

Several studies find links between earlier family structure transitions and adverse outcomes for adolescents and young adults, such as decreased educational engagement or attainment and increased out of wedlock childbearing (Brown, 2006; Case, Lin, & McLanahan, 2001; Cavanaugh, 2008; Wu, 1996; Wu & Martinson, 1993). However, these studies provide little evidence of whether family structure transitions influence younger children's development, despite the fact that poor adolescent outcomes may have antecedents in childhood (Gibson-Davis, 2008).

The second approach examines associations between family instability, defined by the number of family structure transitions a child has experienced, and child wellbeing. Family instability is associated with higher levels of behavior problems and lower achievement for (at least some groups of) children, although the latter association may largely reflect the characteristics of unstable families (Cavanaugh, 2008; Fomby & Cherlin, 2007; Osborne & McLanahan, 2007). These studies, however, do not consider whether particular types of family structure transitions may differentially affect children's development, and face challenges in addressing selection bias.

The third methodological approach uses longitudinal data to estimate associations between family structure transitions and changes in children's development. The most rigorous of these studies have used child fixed effects methods, which compare "average" outcomes for the same child when observed in different family structure states (e.g., in a single- and a social-parent family), thus reducing selection bias (Foster & Kalil, 2007). Although findings are somewhat mixed, these studies generally suggest negative effects of single- and social-parent family structure on both behavior and achievement (Aughinbaugh et al., 2005; Dunifon & Kowaleski-Jones, 2002; Gennetian, 2005).

Although capable of reducing selection bias, prior studies using child fixed effects methods have confounded the effects of family structure states and transitions by identifying effects for only those children who experience transitions, despite the fact that these associations may differ. Furthermore, studies distinguishing recent family structure transitions from distal transitions tend to find stronger links to child outcomes for the former, suggesting that some portion of the adverse consequences of family dissolution or remarriage are likely to be short lived (Hao & Xie, 2002; Hetherington & Stanley-Hagan, 1999; McLanahan, 1997). Some studies have also found that having experienced a family structure transition has a larger adverse impact on behavior than does experiencing a stable single- or social-parent family (Cavanaugh & Huston, 2006; Najman, Behrens, Andersen, Bor, O'Callaghan, & Williams, 1997). Taken together, these findings highlight the importance of distinguishing the effects of stable residence in, and transitions into, particular family structures.

Associations between family structure and child wellbeing are also likely to differ by child age. Most children will experience a significant amount of stress during family structure transitions. Yet, particular types of transitions may create unique challenges for children of different ages, as children's developmental needs differ by age (Hetherington, 1999). Most studies of family structure have focused on adolescents and little is known about these associations during middle childhood (Hofferth, 2006). Yet, understanding these relations during middle childhood is important given the developmental tasks associated with this period. Middle childhood is marked by the continued development of cognitive skills, particularly those related to the ability to reason. During this time, trajectories of achievement are established and thereafter remain relatively stable (Kowaleski-Jones & Duncan, 2000).

Middle childhood is also a period of increasing independence during which the ability to understand social contexts outside of the family and to reflect on one's own actions emerges. Social comparisons and competition with peers also emerge, and are linked to the development

of social competence and self esteem (Eccles, 1999). Children's behavior during middle childhood shows both continuity and change, with a general decline in problem behavior over the elementary school years (NICHD Research Network, 2004). Experiencing single- or social-parent family structures or family structure transitions during this period may influence these developmental tasks.

In this study, we use hierarchical linear models to estimate the effects of family structure states and transitions on children's achievement and behavior trajectories between ages 6 and 12. We focus on 3 specific research questions: (1) Are changes in children's achievement and behavior influenced by the proportion of time they spend in single-mother and social-father families? (2) Are changes in children's achievement and behavior associated with stable residence in a single-mother or social-father family as well as family structure transitions? (3) Are changes in children's achievement and behavior affected by specific types of transitions, in particular transitioning into single-mother and social-father families?

Based on prior theory and research, we expect children who experience single-mother and social-father family structures, as well as family structure transitions, to display increasing behavior problems and decreasing achievement compared with children consistently residing with both of their biological parents. Furthermore, we expect both of these family structure states and transitions to be unfavorably associated with changes in children's achievement and behavior during middle childhood. It is unclear whether these effects will be of a similar magnitude, although prior research suggests that family structure transitions may be more strongly linked to adverse outcomes than stable residence in a single-mother or social-father family (Hao & Xie, 2002).

## METHOD

### Data

We use data from the NLSY, a nationally representative sample of youth age 14 to 21 in 1979 who were interviewed annually from 1979 to 1994, and biennially thereafter. The NLSY collects detailed information on marriage and family structure, as well as a host of economic, demographic, and other background characteristics. In 1986, the NLSY began a separate biennial survey of children born to women of the original 1979 sample. This supplement collects information about child health, development, and well-being for children living with their biological mothers. Although the NLSY sample is not nationally representative of all children in the U.S., it is larger and more nationally representative than samples used in most other studies on this topic (Aughinbaugh et al., 2005).

We used a sample of children observed between the ages of 5 and 12 and pooled across cohorts from 1986 to 2002. These children were between ages 5 and 7 (on average 6) when first observed, and ages 7 and 9 (on average 8), 9 and 11 (on average 10), and 11 and 13 (on average 12) during the second, third, and fourth observations. To be included in our analyses, a child must have complete data at all four observation points for the particular outcome being analyzed. We identified 5,104 potential observations in the NLSY. Of these, 3,862 (76%) had complete data for at least one outcome. However, missing item level data led us to use slightly smaller sample sizes for each of our dependent measures; we observed 3,270 (64%) children for behavior problems, 3,293 (65%) for reading, and 3,383 (66%) for math. Excluded cases differed from our analysis sample on some important baseline characteristics, although it is not clear how these differences might affect our analyses. Excluded children were more likely to have mothers who were older, had been in a fight, smoked during pregnancy, and had lower academic aptitude. In addition, they were more likely to be Hispanic and female, and had higher household incomes in early childhood (results not shown).

We used multiple imputation techniques to impute missing data for all of our predictor variables. We followed Von Hippel's (2007) advice to impute variables with any type of missing data for all cases, and then delete cases with missing outcome data. This resulted in imputing at least one family structure measure or covariate for 29% to 30% of the observations in our analysis sample (depending on the outcome of interest). We used STATA's ICE software to impute five datasets, and MIM to conduct the analyses.

## Measures

**Achievement and Behavior**—The mathematics and reading recognition subtests of the Peabody Individual Achievement Test (PIAT) were used to measure children's achievement (Dunn & Markwardt, 1970). Each test includes 84 items assessing children's subject knowledge. Resulting scores represent the number of items answered correctly on the test. Behavior problems are assessed by the total score on the Behavioral Problems Index (BPI; Zill & Peterson, 1986). Mothers are asked 28 items about their child's behavior. Responses were dichotomized to indicate the presence or absence of problem behaviors, and then summed; resulting scores range from 0 to 28.

**Family structure**—For children residing with their biological mothers, during each biennial interview the NSLY collected data on whether their biological father and their mother's current partner or spouse was present in the household, as well as their mothers' marital status. We used these data to construct indicators of whether children were residing in a single-mother family, a social-father family (the mother is married to or cohabiting with a partner who is not the child's biological father), or a two-biological-parent family (the mother is married to or cohabiting with the child's biological father) at each assessment. We then created continuous measures of the proportion of time a child spent in each type of family structure (single-mother and social-father) between ages 6 and 12 from these data. On average, children spent 14% of their time in a social-father family and 31% in a single-mother family during middle childhood.

We also constructed a dichotomous measure for whether a child experienced any family structure transitions between ages 6 and 12 (1 = *yes*) and a summary measure of the total number of transitions a child experienced between ages 6 and 12. Approximately 32% of the sample experienced at least one family structure transition between ages 6 and 12. Among children who experienced a transition, just under two-thirds experienced only one transition and slightly more than a third experienced two or more transitions.

Finally, we created a set of indicators for whether a child experienced transitions into a two-biological-parent family, a single-mother family, and a social-father family. About 20% of children experienced a transition into a single-parent family and 16% experienced a transition into a social-father family. Approximately 8% of children experienced a transition into a two-biological-parent family; given the rarity of this transition, however, related findings are not reported in the text or tables.

We define family structure as a function of household composition, rather than marital status. We adopt this strategy because household composition is likely to be salient in shaping children's routines and experiences. However, it is important to recognize that these family structures largely, although not entirely, correspond to marital status. For example 48% of sample children resided in a two-biological-parent family in which their parents were married during all or part the observation period, whereas less than 1% resided in a two-biological-parent family in which their parents were cohabiting throughout the observation period. Of children in stable social-father families, the vast majority experienced a social-father family in which the parents were married during all or part of the observation period (less than 1% of the full sample was in a stable cohabiting social-father family). Of those children who transitioned into social father families, most transitions involved marriage: About 11% of

sample children experienced a transition into a married social-father family whereas only 6% transitioned into a cohabiting social-father family. The fact that (persistent) cohabitation was uncommon in our sample limited our ability to determine with certainty whether associations of family structure with children's achievement and behavior trajectories differed for cohabiting and married families.

**Control variables**—In our analyses, we included a host of control variables that might account for social selection into family structure states and transitions, and also be independently associated with achievement and behavior trajectories. The control variables used to predict initial levels of achievement and problem behavior included the following maternal characteristics: age at the child's birth, highest grade completed, academic aptitude (age-standardized Armed Forces Qualifying Test score in 1980), prenatal cigarette smoking, being in a fight at work or school (1980), locus of control (1979), and self esteem (1980). Child characteristics included race/ethnicity (indicators for black and Hispanic), low birth weight, birth order, disability, age, and gender. We also controlled for the following household characteristics averaged from birth to age six: mean household income-to-needs ratio, mean maternal work hours, and mean number of children in the household, as well as percent of time residing with a grandparent, with a single mother, and in an urban area.

To predict changes in achievement and behavior (trajectory slopes), it was important to only include covariates that are unlikely to be influenced by family structure during this time. The parsimonious set of controls selected to predict changes over time were child age, race, and gender, as well as maternal academic aptitude (AFQT score).

### Analytic Strategy

We used observations of children at (on average) ages 6, 8, 10, and 12 to model academic achievement and behavioral trajectories during middle childhood with hierarchical linear models (HLM; Bryk & Raudenbush, 1992). Children's initial levels of achievement and behavior problems at age 6 were modeled as a function of their prior and current family structures. Changes in children's outcomes were modeled as a function of family structure states and transitions between ages 6 and 12. The HLM estimation models took the form:

$$Y_{it} = P_{0i} + P_{1i}AGE_{it} + P_{2i}AGESQUARED_{it} + E_{it} \quad (1a)$$

Child  $i$ 's behavior or achievement ( $Y$ ) at age  $t$  was estimated as a function of the child's initial level of the outcome at age 6 ( $P_{0i}$ ), a slope that varies over time as a function of child age ( $P_{1i}$ ), a quadratic age term to represent acceleration or deceleration in the slope ( $P_{2i}$ ), and an individual error term ( $E_{it}$ ). The age variable in these analyses was centered at age 6, and increased by two with each subsequent observation. The level-2 equations were:

$$P_{0i} = B_{00} + B_{01}EARLYFAMSTRUCT_{1i} + B_{02}FAM_{1i} + B_{03}CHILD_{1i} + B_{04}FAMSTRUCTURE_{it} + E_{0i} \quad (1b)$$

$$P_{1i} = B_{10} + B_{11}FAMSTRUCTURE_{it} + B_{13}FAM_{it} + B_{14}CHILD_{1i} + E_{1i} \quad (1c)$$

The initial level ( $P_{0i}$ ) and subsequent linear slope ( $P_{1i}$ ) were taken as outcomes and predicted by family structure states and transitions, time invariant family and child controls, and random error terms. For the models predicting math trajectories, however, we omitted the random error term ( $E_{1i}$ ) when predicting the slopes because specifications including this term did not converge. We estimated four models (focusing on different sets of family structure variables) for each of the three outcomes. The key parameter of interest in these models is  $B_{t1}$  which indicates whether children experiencing a particular family structure state or transition between ages 6 and 12 exhibited different *rates of change* in their behavior and achievement trajectories than those residing with both of their biological parents throughout this time period. We focus only on differences in children's achievement and behavior trajectory *slopes* between ages 6 and 12 because estimates of change over time are less likely to be biased by social selection than are estimates of initial levels of achievement or behavior.

Our family structure measures predict linear achievement and behavior trajectories over time. Estimating such a continuous slope parameter is most appropriate if changes in children's behavior and achievement occurred both before and after a given family structure experience, and accumulated over time. If, however, the effects of family structure events were transient, such that changes in behavior or achievement did not precede or persist, this model may not have accurately captured the full effects of family structure experiences, and may have underestimated such effects.

The intercepts of the HLM models (age 6 achievement and behavior) were predicted by children's early family structure experiences ( $EARLYFAMSTRUCT_{1i}$ ) and family structure states and transitions after age 6 ( $FAMSTRUCTURE_{ti}$ ). By modeling initial differences in behavior and achievement as a function of later family structure experiences, we tested for differential selection into family structure states and transitions. If the later family structure measures predicted the intercept(s) then this indicates that children experiencing single-mother or social-father family structures or family structure transitions differed from their peers in these domains from very early on. Such initial differences may partially account for later variation in trajectories. Thus, modeling this selection reduces potential biases in the association between family structure experiences and children's subsequent behavior and achievement. Given the temporal ordering of the variables, these associations do not represent causal associations.

## RESULTS

### Descriptive statistics

As expected, unadjusted means suggest that behavior problems declined and achievement scores improved over time among children in most family structures, with the exception of a slight increase in behavior problems for children residing only in social-father families (Table 1). The decline in behavior problems and increase in achievement, however, was largest among children residing only with both biological parents throughout middle childhood.

As noted above, an important concern is that individuals may differ in systematic ways across family structures leading to selection biases. Descriptive statistics confirm this possibility (Table 2). Children who did not experience family structure transitions during middle childhood had older mothers with higher levels of aptitude, education, and family income than those who experienced transitions; they were also less likely to be Black or Hispanic. Because such characteristics have been linked to children's behavior and achievement, we turned to multivariate HLM analyses to adjust for these differences.



## Children's achievement and behavior trajectories

During middle childhood, behavior problem trajectories were curvilinear (Table 3). The positive coefficient for the age variable and the negative coefficient for the quadratic age measure reveal a linear increase in behavior problems over time, which is offset by an exponentially decreasing rate of decline in later middle childhood. A similar trend was apparent for reading and math skills (Table 3); again, the positive coefficients for age and negative coefficients for the quadratic age measure indicate that scores increased over time, but at a declining rate. This pattern of change is primarily due to test construction, and the smaller number of age-appropriate items for older children (Dunn & Markwardt, 1970).

### **Are changes in children's achievement and behavior influenced by the proportion of time they spend in single-mother and social-father families?—**

We first examined associations between the amount of time children spend in particular family structures during middle childhood and changes in behavior and achievement (Model 1, Table 4). Our measures of time spent in single-mother or social-father families during middle childhood reflect both transitions into, and stable residence in, these family types. The comparison group in these analyses (and all others) was children consistently residing in two-biological-parent families between ages 6 and 12.

Neither the proportion of time that children spent in single-mother nor social-father families between ages 6 and 12 was associated with initial levels of behavior and achievement. This indicates that children who later resided in these family types did not differ significantly from their peers with regard to behavior and achievement at age 6, once a host of family background variables were included as covariates. Indeed, across all of the models we estimated, we found no significant associations between children's initial levels of behavior and achievement (at age 6) and their subsequent family structure experiences (between ages 6 and 12), suggesting that the control measures account for social selection processes. As a result, we focus the discussion of our findings on estimates of the linear slopes.

The proportion of time spent in both single-mother and social-father families was positively associated with increases in behavior problems over time, and the proportion of time spent in a single-mother family was also associated with decreases in achievement over time (Table 4). Spending all (100%) of middle childhood in either a single-mother or social-father family was associated with .12 and .11 point increases in behavior problems per year. Using the standard deviation (*SD*) for BPI at age 12 to convert these estimates into effect sizes suggests increases in behavior problems of about .02 *SDs* per year for each family type. Thus, by age 12 children who consistently resided in these family structures had behavior problem scores that were about .12 *SDs* (.72 and .66 points) higher than those of children who resided in a two-biological-parent family throughout this time period. Spending middle childhood in a single-mother family was also associated with lower reading and math achievement slopes, leading to scores that were about .10 and .08 *SDs* (1.38 and .84 points) lower by age 12. In contrast, residing only in a social-father family appeared to have no association with achievement.

### **Are changes in children's achievement and behavior associated with stable residence in a single-mother or social-father family as well as family structure transitions?—**

Results presented in Table 5, indicate that children who experienced family structure transitions exhibited significant increases in behavior problems and marginally significant ( $p < .10$ ) decreases in achievement during middle childhood compared with their peers residing in stable two-biological-parent families. Having ever experienced a family structure transition was associated with a .02 *SD* (.11 point) increase in the behavior problem slope and with .01 *SD* (.15 and .09 point) decreases in both reading and math slopes per year. By the time children were 12 years old, those who experienced a family structure transition

had .12 *SDs* higher behavior problems and .06 *SDs* lower reading and math scores than their peers who resided only with their biological parents during middle childhood. In addition, stable residence in both single-mother and social-father families was associated with increased behavior problems over time, and these effects were similar to those for children experiencing family transitions (.15 and .18 *SDs* respectively); stable residence in a single-mother family was also associated with decreases in reading and math achievement slopes.

When family structure transitions were modeled as the number of transitions experienced, each additional transition was associated with a .01 *SD* (.08 point) increase in behavior problems per year and with marginally significant .01 *SD* (.09 and .06 points) decreases in reading and math achievement per year (Table 5, model 3). These estimates translate to approximately a .06 *SD* change between ages 6 and 12 for each outcome.

**Are changes in children's achievement and behavior affected by transitioning into single-mother and social-father families?**—Results from model 4 in Table 5 suggest that transitioning into a single-mother family during middle childhood was linked with increased behavior problem slopes (.02 *SDs*; .10 points), but not with reading or math achievement slopes. Transitioning into a social-father family was associated with decreases in reading achievement (.01 *SDs*; .20 points) over time, but not with changes in children's behavior problems or math achievement. Thus, by age 12, children residing in only a single-mother family during middle childhood had an average of .18 *SDs* higher behavior problems and .12 *SDs* lower math and reading scores than their counterparts residing only in a two-biological-parent family; those residing in only a social-father family had .18 *SDs* higher behavior problems. Children experiencing transitions to single-mother and social-father families, respectively, had .12 *SDs* higher behavior problems and .06 *SDs* lower reading scores. As with the prior results, compared with children residing only with two biological parents during middle childhood, stable residence in both single-mother and social-father families was associated with increases in behavior problems, and stable residence in a single-mother family was associated with decreases in reading and math over time.

To test whether children's behavior problems and achievement trajectories differed according to the particular family structure states and transitions they experienced, we conducted Wald tests of the equality of the coefficients for the stable single-mother and social-father family structure variables with those for transitions into each of these family types. Across all three outcomes, we found no significant differences between the coefficients for the state and transition variables. This suggests that associations of stable residence in a single-mother or social-father family with children's behavior and achievement trajectories were similar in magnitude to those of transitioning into each of these family types.

**Robustness Checks**—The results presented above considered whether family structure states and transitions predicted linear trends in the outcomes between ages 6 and 12. Yet, it is possible that these factors also predict a nonlinear trend (modeled by a quadratic age term), which would suggest an increasing (decreasing) rate of decline (growth) in the outcome measures over time. We tested for such associations in supplemental models (not shown) and found that, with few exceptions, our measures of family structure states and transitions were not associated with nonlinear trends in the outcomes. Of particular note, however, we found that behavior problems trajectories for children transitioning to social-father families exhibited a steeper incline followed by a faster rate of decline over time than those for children residing only in two-biological-parent families throughout middle childhood, implying that there was an adverse effect of transitioning to a social-father family on behavior problems, but that this effect decreased over time. These findings suggest that future research considering the timing and persistence of increases in behavior problems may shed further light on how maternal repartnering affects children.

## DISCUSSION

An important contribution of our study is untangling the effect of stable residence in a single-mother or social-father family from that of transitioning into each of these family structures. Most prior studies have focused either on associations of family structure states or family instability (Amato, 2005; Fomby & Cherlin, 2007; Osborne & McLanahan, 2007) with child outcomes. Our modeling strategy allowed us to estimate the independent effects of each of these factors on changes in children's behavior and achievement trajectories during middle childhood. That both factors appear to independently, albeit modestly, influence children's trajectories in these domains suggests that future research should consider the separate effects of each when analyzing the influence of family structure experiences on children's wellbeing, and should also take into account the dynamic nature of children's development.

Our discussion focuses on whether family structure states and transitions are associated with changes in children's achievement and behavior between ages 6 and 12, rather than on initial levels of behavior and achievement. We choose to focus on changes over time because this allows us to adjust for initial differences in levels of achievement and behavior which may reflect both causal effects of early family structures and transitions as well as observed and unobserved social selection processes. If changes in achievement and behavior are less likely to be affected by unobserved social selection than are initial levels, our slope estimates of family structure states and transitions are less susceptible to being biased by omitted variables. Our analysis of children's trajectories found that both behavior problems and achievement increased over time, although at a declining rate, such that average behavior problems were lower at age 12 than at age 6.

Compared with children residing in a stable two-biological-parent family, children residing in a stable single-mother family, and those residing for longer periods of time in this family structure, exhibited increased behavior problem slopes and decreased reading and math achievement slopes during middle childhood. Put another way, during middle childhood children who lived with two biological parents demonstrated larger declines in behavior problems and larger increases in achievement than those experiencing single-mother families.

Children who experienced stable social father families were uncommon in our sample, which may explain the findings that emerged. As expected, we found that compared to children in stable two-biological parent families these children had larger increases in behavior problems during middle childhood. Yet, they also had (marginally significant) larger increases in math achievement. This result was unexpected, and may be spurious.

Results also indicated that family structure transitions, in general, are adversely associated with changes in children's behavior and achievement between ages 6 and 12. Specifically, we found that transitioning to a single-mother family was associated with increases in behavior problems, whereas transitioning to a social-father family was associated with decreases in reading achievement.

In interpreting our results, it is important to note that all of the estimated associations are small, the largest being .18 *SDs* for behavior and .11 *SDs* for achievement. Earlier meta-analyses found mean effect sizes for children experiencing single-mother families to be .23 *SDs* for measures of behavior and .17 *SDs* for achievement (Amato, 2001), and for those experiencing social-father families to be .32 *SDs* for behavior and .07 *SDs* for achievement (Amato & Keith, 1991). One reason that we found smaller effects than many other studies, particularly with regard to behavior problems, may be that we focused on changes in achievement and behavior problems during middle childhood while accounting for initial differences. This approach is likely to reduce bias due to omitted variables and social selection. Studies that have used analytic methods that reduce such biases also find smaller effect sizes than those identified in

the meta-analyses (Aughinbaugh et al., 2005; Dunifon & Kowaleski-Jones, 2002; Gennetian, 2005).

We found more consistent links between family structure states and transitions with children's behavior than with their achievement. Indeed, of the family structure states and transition measures we modeled, only stable residence in a single-mother family was consistently linked to reading and math achievement, whereas stable residence in a single-mother or social-father family and transitioning into a single-mother family were linked to increased behavior problems. This pattern may reflect the variability and malleability of child behavior as a function of context during middle childhood; in contrast, children's achievement trajectories may be more stable at this developmental stage due to the cumulative nature of achievement and the importance of school instruction in shaping learning (Kowaleski-Jones & Duncan, 2000). As noted above, most prior studies have also found family structure to be more closely linked to child behavior than to achievement (Amato, 2001; Amato & Keith, 1991; McLanahan, 1997).

Our finding that transitioning to a social-father family during middle childhood was associated with decreased reading achievement over time, but not with behavior problems or math achievement is puzzling. Although we are aware of no theoretical explanation for this finding, it is notable that Aughinbaugh et al. (2005), using child fixed effects methods and NLSY data, also find decreases in reading achievement, but not associations with behavior problems or math for children whose mothers (re)married. Nonetheless, we cannot rule out that this finding may be spurious.

This study has several limitations. To begin with, our outcome measures have important shortcomings. The PIAT and BPI are frequently used indicators of child achievement and behavior problems and both have adequate reliability and validity. Nonetheless, given that they are designed for use across a broad age range of children, both measures may lack the sensitivity or specificity to precisely detect all of the potential effects of family structure states and transitions on child development. Moreover, our behavioral outcomes are reported by mothers. As such, associations between family structure changes and problem behavior may reflect changes in how mothers perceive their children's behavior rather than changes in children's actual behavior. More sensitive measures, such as observational assessments of child behavior, may therefore more accurately identify effects.

Second, our models included only a limited number of exogenous factors that may accompany family structure transitions, and excluded factors that may be endogenous to family structure, such as decreased family income, new step- or half-siblings, or residential relocations. We took this approach in order to get the best "full" estimates of associations of family structure states and transitions with children's outcomes (Aughinbaugh et al., 2005). Nevertheless, particular family structure transitions may differ in the extent to which they result in upheaval in children's lives and associations may differ accordingly (Gennetian, 2005; Ginther & Pollak, 2004).

Third, like other research in this area, our estimates may be partly or fully explained by measures that are omitted from our estimation models. In this case, we should worry about factors that may lead both to family structure states and transitions and to changes in children's behavior problems and achievement over time. For example, a change in a mental health or stress may precede and cause the dissolution of a mother's partnership and also affect her child's subsequent behavior.

Fourth, there may be considerable heterogeneity in associations of family structure transitions and states with children's behavior and achievement trajectories that was obscured in our analyses. Perhaps most notably, the associations of interest may differ by marital status in two-

parent families (Brown, 2006). To address this issue we estimated supplemental versions of model 4 in Table 5 (results not shown), in which we defined family structure states and transitions such that they accounted for marital status among children living with two (biological or social) parents. We found no significant differences by marital status for any of the family structure states or transitions; yet, in our sample most two-parent families—both biological and social—were married. Thus, it is likely that the cell sizes for these analyses were too small to produce precise estimates. Future research will benefit from analyses that are better able to separate the influence of family structure states and transitions on children's wellbeing trajectories while also accounting for differences by marital status.

Other sources of heterogeneity are also likely to be important. Associations may be weaker or stronger across families with differing levels of conflict, by whether children are co-residing with grandparents, for different racial and ethnic groups, or by child gender (DeLeire & Kalil, 2002; Dunifon & Kowaleski-Jones, 2002; Hetherington et al., 1992; Hill, Yeung, & Duncan, 2001). Our analyses are silent in this regard.

Finally, we operationalized family structure transitions as occurring at any point over a six-year period during which sample children were between the ages of 6 and 12. As such, our estimates represent the average effect of each family structure transition on child behavior or achievement over this entire time period. They may therefore understate the short-term effects of such transitions if the associations fade over time.

Although our results must be viewed with caution in light of these limitations, they suggest that residence in single-mother and social-father families, as well as transitions to single-mother families, are associated with relatively small increases in children's behavior problems and, to a lesser extent, declines in achievement. Prior research suggests that economic resources, parenting quality, and stress for children and parents are likely to be the intervening processes through which these effects are initiated. However, additional research focusing on the mechanisms through which family structure affects children is necessary in order to design appropriate interventions and policies to promote child wellbeing in single-mother and social-father families.

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**Table 1**  
Descriptive Statistics for Behavior Problems and Achievement Measures by Family Structure States and Transitions at Age 6 and 12

Variable	Behavior Problems Index (N = 3,270)						PIAT Reading Recognition (N = 3,293)						PIAT Mathematics (N = 3,383)					
	Age 6			Age 12			Age 6			Age 12			Age 6			Age 12		
	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N
Full sample (N = 3,862)	9.09	5.81		8.61	6.29		16.80	6.62		54.53	13.70		15.15	6.41		50.60	6.41	
Always two-biological-parent family (N = 1,868)	8.31	5.39		7.56	5.79		17.31	6.84		56.94	13.25		16.02	6.72		52.63	6.72	
Always single-mother family (N = 656)	10.19	6.23		10.02	6.78		15.89	6.14		50.02	13.08		13.56	5.50		46.62	5.50	
Always social-father family (N = 170)	9.27	6.26		9.44	7.04		16.69	6.28		55.81	13.27		15.07	6.28		51.87	6.28	
One or more transitions (N = 1,188)	9.76	5.98		9.45	6.39		16.48	6.49		52.97	13.95		14.63	6.17		49.34	6.17	
Transition to single-mother family (N = 692)	9.53	5.92		9.20	6.43		16.52	6.27		53.15	13.82		14.80	6.23		49.48	6.23	
Transition to social-father family (N = 630)	9.87	5.88		9.63	6.30		16.25	6.57		52.36	14.16		14.44	5.90		49.43	5.90	

Note: Means and standard deviations presented. Sample sizes for the BPI and the PIAT Reading Recognition and Mathematics subscales are for observations with non-missing data on the relevant measure at all time points; sample sizes for family structure state and transition variables are based on 3,862 observations with non-missing data on at least one of the outcome measures at all time points.



**Table 2**

Descriptive Statistics for Covariates at Age 6

Variable	Full Sample		No Transitions		One or More Transitions		Transition to Single-Mother Family		Transition to Social-Father Family	
	M	SD	M	SD	M	SD	M	SD	M	SD
Single-mother family at age 6 (%)	0.29		0.24		0.41		0.20		0.60	
Social father family at age 6 (%)	0.09		0.06		0.16		0.20		0.10	
Black (%)	0.32		0.30		0.36		0.36		0.32	
Hispanic (%)	0.21		0.19		0.23		0.24		0.25	
Mother age at first birth	23.81	3.70	24.24	3.66	22.84	3.62	23.14	3.66	22.48	3.55
Mother highest grade completed at age 6	12.42	2.17	12.57	2.24	12.07	1.96	12.08	2.04	12.00	1.78
Maternal aptitude (AFQT)	36.97	30.86	40.25	32.26	29.58	25.97	30.36	26.63	29.28	25.21
Maternal locus of control	8.87	2.40	8.79	2.43	9.06	2.33	9.02	2.32	9.11	2.33
Maternal self esteem	3.21	0.39	3.22	0.40	3.18	0.37	3.18	0.38	3.17	0.38
Prenatal smoking (%)	0.27		0.25		0.31		0.29		0.33	
Mother ever fought at work or school (%)	0.18		0.17		0.22		0.22		0.23	
Low birth weight (%)	0.07		0.07		0.08		0.08		0.06	
Birth order	1.87	1.00	1.87	0.99	1.88	1.01	1.92	1.03	1.85	1.04
Child disabled (%)	0.08		0.08		0.09		0.10		0.08	
Child is male (%)	0.50		0.51		0.49		0.48		0.50	
Mean income-to-needs ratio, birth to age 6	2.12	1.39	2.28	1.42	1.76	1.23	1.88	1.30	1.67	1.18
Mean maternal work hours, birth to age 6	953.88	792.24	941.91	798.75	980.82	776.78	979.10	758.70	1032.77	786.78
Mean number of children in family, birth to age 6	2.22	1.00	2.23	1.00	2.20	1.00	2.28	1.01	2.10	1.01
% time residing with grandparent by age 6	0.13	0.27	0.11	0.26	0.17	0.29	0.16	0.28	0.19	0.30
% time in single-mother family by age 6	0.33	0.43	0.28	0.42	0.47	0.43	0.39	0.43	0.55	0.42
% time in urban area, birth to age 6	0.78	0.39	0.78	0.40	0.80	0.37	0.83	0.35	0.78	0.39
Observations	3,862		2,674		1,188		692		630	

Note: Based on 3,862 observations with non-missing data on the BPI, PIAT Reading Recognition subscale, or PIAT Mathematics subscale at all time points. Means and standard deviations presented for continuous variables; percentages presented for dichotomous variables.

Table 3

## Summary of HLM Models Without Covariates

Variable	BPI			Reading			Math		
	$\beta$	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$	
Intercept	9.13***	0.10	16.80***	0.14	14.96***	0.16			
Age	0.23***	0.05	8.86***	0.07	8.73***	0.08			
Age squared	-0.05***	0.01	-0.43***	0.01	-0.46***	0.01			
Observations		3,270		3,293			3,383		

Note: Coefficients and standard errors from HLM models are presented. Age is centered at 5/6 so that it increases from 0 (at age 5/6) to 6 (at age 11/12).

\*\*\*  
p<0.001.

Table 4

Summary of HLM Models Predicting Children's Behavior and Academic Trajectories with Percent Time in Each Family Structure, and with Stable Family Structure States and Any Family Structure Transitions

Variable	BPI						Reading						Math					
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2		Model 1		Model 2			
	$\beta$	SE $\beta$	B	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$		
<i>Intercept at age 6:</i>																		
% time in single-mother family by age 6	0.40	0.32	0.40	0.32	0.27	0.36	0.26	0.36	0.22	0.39	0.25	0.39	0.25	0.39	0.25	0.39		
Single-mother family at age 6	0.15	0.36	0.10	0.37	-0.19	0.41	-0.21	0.42	-0.27	0.43	0.03	0.43	0.03	0.45	0.03	0.45		
Social-father family at age 6	-0.40	0.43	-0.34	0.47	-0.25	0.49	-0.21	0.53	-0.14	0.52	-0.10	0.52	-0.10	0.56	-0.10	0.56		
% time in single-mother family age 6-12	0.38	0.37			-0.37	0.41			0.23	0.47			0.23	0.47				
% time in social-father family age 6-12	0.47	0.45			-0.01	0.49			0.42	0.57			0.42	0.57				
Always single-mother family age 6-12			0.40	0.45			-0.32	0.49			-0.07	0.57			-0.07	0.57		
Always social-father family age 6-12			0.11	0.66			-0.17	0.72			-0.13	0.84			-0.13	0.84		
Any family structure transition age 6-12			0.45	0.29			-0.02	0.32			0.38	0.38			0.38	0.38		
<i>Slope age 6-12:</i>																		
% time in single-mother family age	0.12*	0.05			-0.25**	0.09			-0.14*	0.06			-0.14*	0.06				
% time in social-father family age 6-12	0.11*	0.06			-0.05	0.11			0.05	0.08			0.05	0.08				
Always single-mother family age 6-12			0.16**	0.05			-0.25*	0.10			-0.19**	0.07			-0.19**	0.07		
Always social-father family age 6-12			0.19*	0.08			0.08	0.16			0.21+	0.11			0.21+	0.11		
Any family structure transition age 6-12			0.11**	0.04			-0.15+	0.08			-0.09+	0.05			-0.09+	0.05		
Observations	3,270		3,270		3,293		3,293		3,383		3,383		3,383		3,383			

Note: Coefficients and standard errors from HLM models are presented. All of the control variables listed in Table 2 are used to predict children's initial levels of achievement and behavior. The reference group for the estimates predicting achievement and behavior slopes is "Always two-biological-parent family age 6–12." Controls for child age, race/ethnicity, gender, and mother's academic aptitude (AFQT score) are used to predict children's achievement and behavior slopes.

+  $p < 0.10$ ;

\*  $p < 0.05$ ;

\*\*  $p < 0.01$ ;

\*\*\*  $p < 0.001$ .

Table 5

Summary of HLM Models Predicting Children's Behavior and Academic Trajectories with Family Structure States and Number and Types of Transitions

Variable	BPI				Reading				Math			
	Model 3		Model 4		Model 3		Model 4		Model 3		Model 4	
	$\beta$	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$	$\beta$	SE $\beta$
<i>Intercept at age 6:</i>												
% time in single-mother family by age 6	0.42	0.32	0.41	0.32	0.27	0.36	0.28	0.36	0.25	0.39	0.27	0.39
Single-mother family at age 6	0.23	0.36	0.03	0.40	-0.155	0.40	-0.13	0.46	0.05	0.43	0.12	0.49
Social-father family at age 6	-0.23	0.47	-0.29	0.47	-0.14	0.52	-0.08	0.53	-0.09	0.56	-0.10	0.56
Always single-mother family age 6-12	0.20	0.42	0.41	0.46	-0.41	0.46	-0.47	0.50	-0.12	0.54	-0.21	0.58
Always social-father family 6-12	-0.06	0.65	0.03	0.65	-0.27	0.70	-0.36	0.71	-0.17	0.82	-0.20	0.83
Number of family structure transitions age 6-12	0.18	0.18			-0.08	0.19			0.23	0.23		
Transition to single-mother family age 6-12			0.06	0.28			-0.16	0.28			0.20	0.36
Transition to social-father family age 6-12			0.50	0.34			-0.09	0.37			-0.02	0.44
<i>Slope age 6-12:</i>												
Always single-mother family age 6-12	0.16**	0.05	0.16**	0.05	-0.24*	0.10	-0.24*	0.10	-0.18*	0.07	-0.18*	0.07
Always social-father family age 6-12	0.19*	0.08	0.19*	0.08	0.09	0.16	0.09	0.16	0.21+	0.11	0.22+	0.11
Number of family structure transitions age 6-12	0.08**	0.03			-0.09+	0.05			-0.06+	0.03		
Transition to single-mother family age 6-12			0.10*	0.05			-0.10	0.09			-0.04	0.06
Transition to social-father family 6-12			0.06	0.05			-0.20*	0.09			-0.02	0.06

Variable	BPI			Reading			Math		
	Model 3	Model 4	Model 3	Model 3	Model 4	Model 3	Model 3	Model 4	Model 4
Observations	3,270	3,270	3,293	3,293	3,293	3,383	3,383	3,383	3,383

Note: Coefficients and standard errors from HLM models are presented. All of the control variables listed in Table 2 are used to predict children's initial levels of achievement and behavior. The reference group for the estimates predicting achievement and behavior slopes is "Always two-biological-parent family age 6–12." Although results are not reported on the table, model 4 includes an indicator for transition to two-biological-parent family predicting the age 6–12 slope. Controls for child age, race/ethnicity, gender, and mother's academic aptitude (AFQT score) are used to predict children's achievement and behavior slopes.

+  $p < 0.10$ ;

\*  $p < 0.05$ ;

\*\*  $p < 0.01$ ;

\*\*\*  $p < 0.001$ .