# Child Wellbeing in Two-Parent Families: How Do Resources, Relationships, and Parenting Matter?

Lawrence M. Berger
University of Wisconsin--Madison

Sara S. McLanahan
Princeton University

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Note: Lawrence Berger (lmberger@wisc.edu) is Associate Professor of Social Work and Faculty Affiliate at the Institute for Research on Poverty at the University of Wisconsin-Madison. Sara McLanahan (mclanaha@princeton.edu) is William S. Tod Professor of Sociology and Public Affairs at Princeton University. The Fragile Families and Child Wellbeing Study is funded by NICHD grant numbers R01HD36916, R01HD39135, and R01HD40421, as well as a consortium of private foundations and other government agencies. This research supported by NICHD grant number K01HD054421 (to Berger) and by funding from the Institute for Research on Poverty and the Waisman Center (NICHD grant number P30 HD03352) at the University of Wisconsin-Madison. We thank Maria Cancian, Tom DeLeire, and seminar participants at the Center for Demography and Ecology at the University of Wisconsin-Madison, the West Coast Poverty Center at the University of Washington-Seattle, and the French National Institute for Demographic Studies (Institut national d'études démographiques) for helpful comments and advice. Address for correspondence: Lawrence M. Berger, University of Wisconsin-Madison, School of Social Work, 1350 University Avenue, Madison, WI 53706.

## ABSTRACT

A growing literature reports considerable heterogeneity in the advantages associated with living in a two-parent family, with children living with their married biological parents exhibiting better outcomes than children living with cohabiting biological parents or with their biological mother and a married or cohabiting social father. In attempting to explain these differences in outcomes, researchers have focused almost exclusively on differences in levels of economic resources, family relationships, and parenting practices across families. In contrast, we ask whether differences in the 'returns' to economic resources, family relationships, and parenting practices can account for differences in child outcomes across family types. Using a Blinder-Oaxaca decomposition technique, we show that differences in returns to these factors, as well as differences in levels thereof, are important, with the former being more important for children's social-emotional adjustment and the latter being more important for cognitive development.

High rates of divorce, non-marital fertility, and multi-partnered fertility in the United States have led to growing diversity and complexity in family arrangements. Whereas the label "two-parent family" once referred to families in which two married adults lived with their joint biological children, today this label includes families with cohabiting biological parents and families with a married or cohabiting social parent, typically the father.

Recent research indicates that "both marital status and biological parentage are integral to children's well-being" (Brown 2010, p. 1065). Specifically, children who live in social-father and cohabiting-parent families exhibit poorer developmental outcomes, on average, than those who live with married biological parents (see, e.g., Artis, 2007; Brown, 2004a, 2006; Hofferth, 2006; Manning & Lamb, 2003). To account for differences in outcomes, researchers have proposed multiple hypotheses, including differences in family (a) economic resources, (b) stability or turbulence, and (c) relationships and parenting practices (parental socialization). Social selection is also thought to account for some of the differences in child outcomes across family types (Brown 2010; Sweeney 2010). Whereas differences in economic resources are typically attributed to social selection, differences in socialization are typically attributed to the idea that social- and cohabiting-parent families are 'incomplete institutions' (Cherlin 1978; Nock, 1995). This argument implies that parental socialization may differ across family types. It also implies that socialization processes may differentially influence children's development across family types. Specifically, children may not benefit as much from the contributions of social and cohabiting fathers as they do from the contributions of biological fathers, particularly if the biological father and mother are married. To date, no study has explicitly tested this hypothesis.

We use data from the Fragile Families and Child Wellbeing Study (FFCW) to examine

whether differences in the 'returns' to (influences of) economic resources, family relationships, and parenting practices account for differences in child outcomes across family types. In other words, we examine whether the *associations* between these factors and children's cognition and social emotional development differ by family type, after accounting for differences in the levels of each of these factors. The FFCW data are especially well-suited for our analyses given that the sample includes a large number of low-SES and minority children. Prior research suggests that low-SES and minority children are disproportionately likely to live in cohabiting parent and social father families and more likely to exhibit adverse developmental outcomes. Furthermore, these families tend to be the primary focus of public policies regarding family formation and child wellbeing. We compare cognitive ability and social-emotional adjustment at approximately age 5 among children in four types of families: married biological-parent families, cohabiting biological-parent families, married social-parent families, and cohabiting social-parent families. Cognitive skills and social-emotional adjustment are important indicators of school readiness, and are strongly correlated with future school performance, adolescent adjustment, and adult outcomes (Duncan & Magnuson, 2011). We employ a Blinder-Oaxaca decomposition technique that allows us to explicitly test whether (net of antecedent and concurrent family characteristics and prior family instability) economic resources, family relationships, and parenting practices have differential influences on the wellbeing of children in each family type, and to separate these influences from the effects of compositional differences in economic resources, family relationships, and parenting practices between families.

We focus on children who are, on average, just over age 5 (mean and median of about 64 months of age) and are thus entering a period of development characterized by the transition from early- to middle-childhood and the initiation of schooling. During this transition period,

children are increasingly influenced by social contexts beyond their home and family, yet they continue to require high levels of parental investment and engagement, which have a relatively less prominent influence on their development as they move further into middle childhood (Eccles, 1999). Middle childhood, in general, is characterized by the ongoing development of cognitive skills and reasoning ability; it is a crucial time for children to establish achievement-related trajectories. It is also a period during which children take on greater independence, are exposed to increasingly complex social environments, build social competence and self-esteem, and learn to reflect on their own behaviors relative to those of their peers (Eccles, 1999; Kowaleski-Jones & Duncan, 2000). Whereas earlier stages of childhood are marked by the need for close intimate relationships, autonomy becomes increasingly more important throughout this period and thereafter, as children age (Schmeekle et al. 2006). As such, family composition, functioning, and investments, including the quantity and quality of economic resources, family relationships, and parenting practices to which children are exposed, are likely to play a key role in the developmental tasks associated with the transition into this stage of development. Furthermore, father involvement tends to be at its highest as children enter middle childhood, and to decrease with child age beginning at about age 6 (Bruce & Fox, 1999; Maume, 2011). Finally, social fathers who enter a family earlier in a child's life are more likely to be perceived by children as "family" than are those who enter later (Schmeekle et al. 2006); thus we might expect the benefits of social father investments that begin earlier in life to be greater than the benefits of investments that begin later in childhood.

## BACKGROUND

### *How Might Returns to Economic Resources, Family Relationships, and Parenting Practices Differ by Family Type?*

There are at least two reasons to expect that the influence of economic resources, family relationships, and parenting practices on children's development may differ by family type. First, families may differ with respect to social capital, which is important in the production of human capital (Coleman 1988). Social capital may vary by family type due to differences in obligations and expectations, trust, family processes, information channels, social and kin networks, social norms, and social organization. Social-father and cohabiting-parent families tend to take the form of more "open" or fluid social structures than biological-parent and married-parent families. The former are characterized by less well-defined boundaries and more complex interrelationships, such that kin and social networks are less likely to share mutual goals. Furthermore, social-father family formation, by definition, involves a change in household composition and frequently involves a residential move, both of which may undermine pre-existing social relationships. Although children in social-father families may have a greater number of parental figures, scholars argue that the family networks of these children may, in fact, be more constrained than those of children in biological-parent families (Stewart 2005). As such, weaker social capital in social-father families is expected to limit the efficient transference of parents' human capital skills to their children.

Differences in social capital and associated outcomes between cohabiting- and married-parent families likely parallel those between social- and biological-father families both because cohabitation is a less complete institution than marriage and also because cohabiting relationships are much less stable than marriages. Family instability, in general, is likely to have adverse consequences for social and kin networks. On the whole, then, we may expect to find a weaker association between parents' educational attainment and children's achievement in both social-father and cohabiting-parent families relative to biological-father and married-parent

families. We may likewise expect that parents will be less efficient at socializing children in the former family types than the latter.

A second reason why there may be differential returns to parental investments across family types is that children may respond differently to identical parenting practices as a result of the role ambiguity in social-father and cohabiting-parent families (Ganong et al. 1999). Evidence suggests that children are likely to challenge or subvert a social father's authority, may exhibit little familial obligation toward him, and may have little motivation to meet his expectations (Schmeekle et al. 2006). Furthermore, the extent to which children accept (particularly cohabiting) social fathers as legitimate parental figures, feel close to them, or view them as "family" varies considerably (Hetherington et al. 1999; Schmeekle et al. 2006). Relative to children's relationships with their biological fathers, relationships with social fathers are more likely to evoke jealousy, competition, resentment, guilt, and loyalty-related conflict, as well as to lack a sense of "we-ness" (Marsiglio 2004). They may also vary by the nature of the social father's relationship with a child's biological father and the degree to which the social- and biological-father are perceived by the child as competing versus cooperating in parenting (Marsiglio & Hinojosa 2007). In addition, children's relationships with their mother may be strained by the presence of a social father and this, in turn, may affect the social father's relationship with the child. The quality of the mother-child relationship has been linked to social fathers' investments in children, such that social fathers tend to reinforce or replicate mothers' parenting behaviors (Marsiglio 2004).

Each of these factors may affect how a child reacts to or interacts with a social father and, thereby, how the child responds to parental investments. Indeed, even when a social father exhibits "readiness to nurture, provide for, protect, and see a stepchild as though the child were

his own", the child may not reciprocate, nor "claim" the social father as a parent (Marsiglio 2004, p. 23). Many social fathers describe being "keenly aware of a child's effort to sustain borders" (Marsiglio 2004, p. 35) such that their attempts to establish closeness are frequently rebuffed (Hetherington et al. 1999). Also, inconsistent or conflicting intentions and perceptions of interactions, behaviors, and experiences by children and social fathers appear to be common, and this, too, may adversely affect the quality of their relationships, adjustment to one another, and reactions to each other and to other family members (Stewart 2005). Ganong and colleagues (1999) find that social fathers' success at building and sustaining positive relationships with children varies considerably by social-father personality traits, the way the child interprets the social father's efforts to engage him or her, and the larger familial context in which they interact.

The physical and emotional instability associated with parental cohabitation may have additional implications regarding children's reactions to parental investments, and this may be especially true with regard to cohabiting social-father families. Specifically, children may be more likely to view married social fathers than cohabiting social fathers as family members. Thus, they may establish a greater sense of unity with a married social father because they interpret the marriage itself as indicative of a considerable commitment on his part to the family as a whole (including to them), rather than solely to the mother (Schmeekle et al. 2006). In contrast, they may view cohabitation as a weaker and less secure commitment to the mother and/or family. For these reasons, identical investments of resources, relationships, and parenting practices may yield fewer benefits in the context of a social-father or cohabiting-parent family, and particularly in a cohabiting social-father family, than in a married two-biological parent family. That is, the same behavior (e.g. reading to a child; disciplining a child) may have a different influence when performed by a married or cohabiting, social or biological father

because children respond differently to each; likewise, returns to maternal investments may differ by family type.

We are aware of only one study that investigates whether identical parenting practices are differentially associated with child outcomes across family types. Using FFCW data Bzostek (2008) finds no differences in the influence of father involvement on child wellbeing. This study, however, examines only one measure of involvement and compares only biological and social fathers. In contrast, our analyses examine differences in the returns to a comprehensive set of economic resources, family relationships, and parenting practices, net of compositional differences in the distribution of these factors across family types. Furthermore, we examine these differences by both father biological status and parental marital status.

### *How Might Levels of Economic Resources, Family Relationships, and Parenting Practices Differ by Family Type?*

In addition to differences in returns to parental investments across family types, we also would expect to find differences in levels of investments (Artis, 2007; Berger, Carlson, Bzostek, & Osborne, 2008; Brown, 2006; Hofferth, 2006; Hofferth & Anderson, 2003). Social selection is likely to play a considerable role here. For example, mothers who form social-father families tend to be more disadvantaged than mothers who live with the biological father of their children; likewise mothers who cohabit tend to be more disadvantaged than those who are married. These disadvantages are apparent in both the characteristics of the mothers themselves (education, employment) and in their access to economic resources such as earnings and child support (Bzostek, McLanahan, & Carlson, 2012; Manning & Brown, 2006; McLanahan & Sandefur, 1994). Similarly, men who become social fathers or cohabit tend to be less advantaged than men who marry childless women and stay married (Hofferth, 2006; Hofferth & Anderson, 2003;

Manning & Brown, 2006). This may reflect that, relative to childless women, single mothers face a lower quality pool of men from which to choose a partner. It may also reflect that financial stability is often viewed as a precondition to marriage but not to cohabitation (Edin & Kefalas, 2005). It is also possible that couples choose to cohabit instead of marry because they believe their relationship is unlikely to last or, in the case of social-father families, if the social father has a limited willingness to invest in the mother's children or to fully support her investments in them (Brown, 2006; Berger et al., 2008). Finally, living in a social-father or cohabiting-parent family may be a marker of past or ongoing family instability, which is associated both with socioeconomic disadvantage and with adverse developmental outcomes for children (Fomby &Cherlin, 2007; Magnuson &Berger, 2009; Osborne & McLanahan, 2007; Cooper, Osborne, Beck, & McLanahan, in press). On the whole, then, associations of living in a social-father or cohabiting-parent family and adverse child outcomes may, at least partially, reflect the characteristics of the parents who select into these families and, in turn, the family experiences (instability) that precede or characterize them, rather than being driven by the family type itself.

Existing empirical research supports that individuals who form social-father and cohabiting-parent families tend to be disadvantaged in ways that are negatively correlated with both parenting practices and child wellbeing; these families are characterized by fewer economic resources and greater instability than families consisting of married biological parents and their joint children (Berger & Langton, 2011; Brown, 2004a, 2006; Eggebeen, 2005; Hofferth & Anderson, 2003; Hofferth, 2006; Manning & Lamb, 2003; Manning & Lichter, 1996; Manning, Smock, & Majumdar, 2004). Yet, whereas social selection has been shown to explain a considerable portion of the observed differences in child outcomes by family structure (Foster & Kalil, 2007), it does not fully explain these gaps (Sigle-Rushton & McLanahan, 2004). In

addition, recent research using FFCW suggests that, at least among mothers who have a nonmarital birth, the vast majority of those who repartner do so with a man who has greater economic capacity than their child's biological father (Bzostek et al., 2012).

Beyond social selection, several theoretical perspectives also suggest that both investments of economic resources in children and the quality of family relationships and parenting practices may be influenced by parental biological and marital status. To begin with, investments in children are expected to be larger in biological-father and married-parent families than in social-father and cohabiting-parent families both because social fathers lack a genetic motivation to invest (Daly & Wilson, 2000) and because both social-father (Cherlin, 1978; Cherlin & Furstenberg, 1994; Furstenberg & Cherlin, 1991) and cohabiting-parent families (Nock, 1995) are characterized by greater parental role ambiguity and instability. As such, obligations to children are less clear in these families than in biological-father and married-parent families. It is also possible that mothers will invest less in their children when living with a social-father because the social-father relationship may require time, attention, or resources from her that she would otherwise devote to her child(ren). Each of these factors suggests that average parenting practices in social-father and cohabiting- parent families will be of lower quality than those in biological-father and married-parent families (Coleman et al. 2000; Marsiglio & Hinojosa 2010).

In addition, partnering and parenting tend to constitute a "package deal" for men (Furstenberg & Cherlin, 1991; Townsend, 2002). This suggests that co-parenting quality may differ by family type because social and cohabiting fathers generally have less responsibility and authority in the family than biological and married fathers (Cherlin, 1978; Cherlin & Furstenberg, 1994; Furstenberg & Cherlin, 1991). That is, because men's roles as partners and

parents are closely linked, the quality of a father's parenting is likely to parallel the quality of his relationship with a child's mother (Furstenberg & Cherlin, 1991; Carlson, Pilkauskas, McLanahan, & Brooks-Gunn, 2011). More broadly, couples with higher quality relationships tend to engage in higher quality parenting, whereas the parenting practices of couples with low quality or stressful relationships tend to reflect these factors (Carlson et al., 2011). In turn, the degree to which parents engage in positive interactions with one another and are able to effectively collaborate in parenting activities is likely to influence child wellbeing.

Empirical results regarding direct investments in children have generally been consistent with these expectations. Resident biological fathers tend to invest more in and to be more involved with children than resident social fathers, and married biological fathers tend to invest more and be more involved than their unmarried counterparts (Berger & Langton, 2011; Hofferth et. al., 2007; Hofferth & Anderson, 2003). Additionally, mothers in social-father families tend to exhibit poorer parenting practices than those in biological-father families (Berger, 2007), and mothers in cohabiting-parent families generally exhibit lower quality parenting than those in married-parent families (Klausli & Owen, 2009). However, there are exceptions to this overall pattern. Most notably, recent analyses from FFCW suggest that (particularly married) social fathers engage in parenting practices that are equivalent to or of higher quality than those of biological fathers (Berger et al., 2008; Gibson-Davis, 2008). At the same time, evidence suggests that social fathers may be more comfortable engaging with children in regular daily activities than with disciplining, monitoring, or showing affection to them; social fathers may also be excluded from childrearing decisions (Marsiglio 2004).

Existing empirical evidence points to three additional conclusions. First, biological- and social-father families exhibit, on average, similar levels of mother-father relationship quality

(Adamsons, O'Brien, & Pasley, 2007; Hanson, McLanahan, & Thomson, 1996); differences in mother-father relationship quality between married and cohabiting parents also tend to be small (Brown, 2004b; Carlson, 2007; Carlson et al., 2011). Notably, however, studies of relationship quality among cohabiting couples have primarily focused on biological parents rather than social parents.

Second, studies have largely focused on co-parenting among (co-resident and non-co-resident) biological parents, but the few studies to examine co-parenting among social-father families have produced mixed results. For example, Hofferth and colleague's (2007) bivariate analyses suggest that married biological fathers take on more responsibility for parenting than social fathers. In contrast, Berger and colleagues (2008) regression analyses reveal that (particularly married) social fathers engage in shared responsibility for parenting and cooperation in parenting at levels that are equal to or greater than those of (married and cohabiting) biological fathers.

Third, mother-father relationship quality and co-parenting are positively correlated with father involvement (Adamsons et al., 2007), father-child relationship quality (Fine & Kurdek, 1995; King, 2006) and child well-being (Hanson et al., 1996; King, 2006). Furthermore, there appears to be a positive association between co-parenting and child development, even after adjusting for mother-father and parent-child relationship quality (Carlson & Magnuson, 2011).

Finally, research has consistently linked higher levels of involvement by resident (married) biological fathers with better child outcomes; however, far less is known about potential links between social- and cohabiting- father involvement and child wellbeing (Carlson & Magnuson, 2011). The limited existing research also suggests that adverse associations between social-father family type and child outcomes are only slightly mediated by mother-

father relationship quality (Hanson et al., 1996; King, 2006).

In sum, prior theory and empirical evidence suggest that economic resources, family relationships, and parenting practices are likely to differ between family types and that these differences are partly, but not fully, driven by social selection. Nonetheless, these factors have rarely been simultaneously examined in the same study (Carlson & Magnuson, 2011; Hofferth, 2006; Nelson, 2004). Furthermore, whereas the influences of economic resources, family relationships, and parenting practices on child development are expected to differ across family types, this hypothesis has not been examined to date. Our study directly tests this hypothesis and extends the literature on differences in levels of economic resources, family relationships and parenting practices of both mothers *and* fathers across family types.

## METHOD

### *Participants*

Our data are drawn from FFCW, a population-based, longitudinal birth cohort study of 4,897 children born between 1998 and 2000 in large U.S. cities (see Reichman et al., 2001). The study design incorporated a three-to-one over-sample of non-marital-to-marital births. As such, the sample includes large proportions of Black, Hispanic, and low-income children, children with nonresident fathers, and children whose families are relatively socioeconomically disadvantaged. These children are also disproportionately likely to experience family structure transitions and family complexity relative to the average child in the U.S.

FFCW interviewed families in person at the time of the focal child's birth and by telephone when the child was approximately 1, 3, 5, and 9 years old. In each interview, parents provided information about family characteristics, resources, and functioning. Subsequent to the age 3, 5, and 9 interviews, families were asked to participate in an in-home assessment of

parenting and child wellbeing through both a questionnaire and interviewer observed items. Families who refused an in-home visit were asked to complete the questionnaire portion of the module by telephone. Our outcome variables are drawn from the age 5 in-home assessment. As noted above, we focus on children at approximately age 5 because family contexts may have unique influences on cognitive and social-emotional adjustment during the transition from early- to middle-childhood and the initiation of schooling.

We utilized multiple imputation techniques to impute values for all variables with missing data for the full FFCW sample of 4,897 children. Specifically, we imputed 10 complete datasets using Stata's ICE program. We then limited our sample to observations of children living with their biological mother and either their biological father or a social father at the time of the age 5 interview. Across the 10 imputed datasets (totaling 48,970 observations) we excluded 1,567 (3.2%) observations (ranging from 122 to 195 observations per dataset) of children who were not living with their biological mother at least half-time and an additional 19,880 (41.6% of the original sample) observations (1,895 to 2,081 per dataset) of children who were living with a single-mother at the time of the interview. This resulted in a potential analysis sample of 27,533 observations (2,695 to 2,817 per dataset). We then followed Von Hippel's (2007) recommendation that cases that originally had missing data on the outcome measures be deleted from the sample after all missing data have been imputed.

Our analyses focus on four outcomes (described below) comprised of the child's scores on the Peabody Picture Vocabulary Test (PPVT), the Woodcock-Johnson Letter-Word Recognition Test (WJ-LW) and the internalizing and externalizing behavior problems subscales of the Child Behavior Checklist (CBCL). The sample sizes for models using the PPVT and WJ-LW, which must be completed in person, are considerably smaller than those for internalizing

and externalizing behavior problems, which can be completed by telephone. A total of 17,642 observations (1,762 to 1,767 per dataset) met our sample inclusion criteria and had non-missing values on at least one outcome; respectively, 13,422 (1,341 to 1,343 per dataset), 13,525 (1,351 to 1,354 per dataset), and 17,509 (1,749 to 1,753 per dataset) met our sample inclusion criteria and had non-missing scores for the PPVT, WJ-LW, and behavior problems measures.

### *Measures*

*Cognitive skills and behavior problems.* Cognitive skills are assessed by the PPVT (Dunn & Dunn, 1997) and WJ-LW (Woodcock & Johnson, 1990). The PPVT measures receptive vocabulary; the WJ-LW assesses children's ability to recognize letters and words and their ability to match words to pictures. Each has been widely used to measure language and cognitive ability. Each must be administered in person. Behavior problems are assessed by the internalizing and externalizing behavior problems subscales of the CBCL (Achenbach, 1991). The CBCL is a commonly used measure of children's behavior problems. It is completed by the adult respondent to the survey, typically the child's mother, and can be administered by telephone. The externalizing behavior problems subscale ($\alpha = .86$) included in the age-5 FFCW in-home assessment consists of 30 items assessing aggressive and delinquent behaviors. The internalizing behavior problems subscale ($\alpha = .75$) consists of 23 items assessing anxious/depressed and withdrawn behaviors. To ease the interpretation of our estimates, we have standardized each of the outcome variables to have a mean of 0 and a standard deviation of 1.

*Family structure.* In our primary OLS specification, we measure family structure with two dichotomous variables indicating: (1) whether the family includes a social father to the focal child (27% of our analysis sample) as opposed to a biological father (73%); and (2) whether the focal child's mother is married to (58%) as opposed to cohabiting with (42%) the father.

Likewise, our Blinder-Oaxaca decompositions assess: (1) differences between all biological- and all social-father families, controlling for whether the mother is married to (versus cohabiting with) the resident father, and (2) differences between all married and all cohabiting families, controlling for whether the resident father is a social (versus biological) father. This allows us to explicitly estimate how differences in both the prevalence of and returns to marriage are associated with variation in outcomes between children in biological- and social-father families. It also allows us to estimate how differences in the prevalence of and returns to social father presence are associated with variation in outcomes between children in married- and cohabiting-parent families.

Additionally, in an extension of our primary OLS specification, we consider four dichotomous variables indicating whether: (1) the focal child's biological father is coresident and married to the child's mother (51%); (2) the biological father is cohabiting with (but not married to) the mother (22%); (3) the social father is coresident and married to the mother (6%); and (4) the social father is cohabiting with the mother (21%). Married biological-father family is the reference group in these models.

*Covariates.* Our primary analyses include four groups of mother-reported covariates representing lagged dependent variables, antecedent characteristics, family (in)stability, and concurrent family characteristics, economic resources, family relationships, and parenting practices. *Lagged dependent variables* consist of the cognitive skills or behavior problems measure at age 3. Their inclusion in the models adjusts for unobserved factors that are correlated with both family type and child outcomes, and which have a consistent effect on the outcome over time. The lagged dependent variables are available for each outcome except the WJ-LW, which was first measured at the age-5 interview. *Antecedent characteristics* constitute exogenous

selection factors which were measured at the child's birth (unless otherwise noted). These include the biological parents' relationships status, the mother's race/ethnicity, the mother's age, whether the mother was born in the US, the mother's educational attainment, whether the mother had experienced multiple partner fertility (measured at age 1), the mother's report of both her father's and her mother's mental health problems history (measured at age 3, but assumed to be exogenous proxies for maternal mental health), child sex, and whether the child was born with a low birth weight. *Family (in)stability* consists of the number of family structure transitions experienced by the child, the duration of the mother-partner (biological or social father) co-residence, and the total number of residential moves experienced by the child. These measures are presumed to be endogenous.

*Concurrent family characteristics, economic resources, family relationships, and parenting practices,* which are measured at age 5, include the number of children and adults in the household, the logarithm of household income, the (biological or social) father's age, the father's educational attainment, whether the father has children with another partner (besides the mother), whether the father has children (other than the focal child) with the mother, whether the father has a limiting health or mental health condition, whether the father has ever been incarcerated, the father's overall treatment of the mother, the quality of coparenting between the mother and father, the frequency with which the mother and father spank the focal child, the extent to which the mother and father are engaged with the focal child, and the mother's depressive symptoms level.

The father's overall treatment of the mother is operationalized by the mean score ($\alpha = .81$ and .73 for biological and social fathers; 1-3 points) of 16 items ranging from "he is fair and willing to compromise when you have a disagreement" to "he hits you with a fist or an object

that could hurt you." Quality of coparenting is assessed by the mean score of three measures: shared responsibility for parenting, which consists of the mean score (1-4 points) of 2 items measuring the frequency with which the father looks after the focal child and the frequency with which he takes the child to appointments such as daycare or the doctor; participation in household chores, which is represented by the mean score (1-4 points) of 2 items measuring the frequency with which the father runs errands for the mother and the frequency with which he fixes things around the house or helps make the home look nicer; and cooperation in parenting, which constitutes the mean score ($\alpha$ = .89 and .74; 1-3 points) of 6 items assessing the extent to which the father acts like the kind of parent the mother would want for her child, can be trusted to take good care of the child, respects the mother's schedules and rules for the child, supports the mother in the way she wants to raise the child, talks with the mother about problems related to raising the child, and can be counted on to look after the child for a few hours. Spanking frequency consists of a single item for each parent reflecting the frequency with which the parent spanked the child in the last month (0-4 points). Engagement with the focal child is assessed by the mean number of days per week ($\alpha$ = .69 for mothers and .89 and .83 for biological and social father, respectively; 0-7 points) that the relevant parent participates in each of 8 activities with the child, including singing songs or nursery rhymes, reading stories, telling stories, playing inside with toys, telling the child he/she appreciated something the child did, playing outside in the yard with the child, taking the child on outings, and watching TV or a video with the child. The mother's depressive symptoms ($\alpha$ = .95; 0-8 points) are measured by the Composite International Diagnostic Interview-Short Form (CIDI-SF) (Kessler, et al., 1998). For ease of presentation, we standardized all non-dichotomous relationship and behaviors measures to have a mean of 0 and a standard deviation of 1.

*Analytic strategy*

To examine associations of family type with child cognitive skills and behavior problems, we estimate a series of ordinary least squares (OLS) regressions for each outcome. We use Stata's MICOMBINE program to produce these estimates utilizing the 10 imputed datasets. We first estimate a simple model in which we regress each outcome on indicators for social-father family and married-parent family. In four subsequent models, we sequentially add the lagged dependent variable, antecedent characteristics (selection factors), family (in)stability measures, and concurrent family characteristics, economic resources, family relationships, and parenting practices. This allows us to examine changes in the coefficients on the family type indicators as each set of covariates is progressively included in the model and, thereby, to determine how each set of factors serves to alter the estimated associations between family type and the outcome. We also estimate an extension to this model in which we replace the indicators for social-father family and married-parent family with four family type indicators that account for both father type and marital status. Thus, rather than estimating coefficients for social father and married father ($\beta_{SF}$ and $\beta_{MAR}$), we estimate $\beta_{COH\ BF}$, $\beta_{MAR\ SF}$, and $\beta_{COH\ SF}$, where the reference group is married biological-father families ($\beta_{MAR\ BF}$, which has been normalized to 0 as the reference category). We then test whether there is a difference in the marriage-cohabitation gap in the outcome between biological- and social-father families with a Wald test that $(\beta_{COH\ BF} - \beta_{MAR\ BF}) = (\beta_{COH\ SF} - \beta_{MAR\ SF})$.

The second step in our analysis is to examine the extent to which each set of covariates explains variation in child outcomes by estimating its marginal contribution to the adjusted R-squared of the full model. The marginal contribution of each set of covariates is computed by estimating variants of the full model in which we sequentially omit the set of focus (but include

all others), then calculating the percentage change in the adjusted R-squared when the set is reintroduced to the model.

The final step in our analysis uses Blinder-Oaxaca decomposition methods (Blinder 1973; Oaxaca 1973) to examine the extent to which differences in cognitive skills and behavior problems between children living with biological and social fathers, and also between children living with married and cohabiting parents, are driven by differences in characteristics, economic resources, family relationships, and parenting practices of the individuals in each family type compared to differences in returns to these factors across family types. Consider the model:

$$Y_{ij} = \boldsymbol{X}_{ij}\boldsymbol{\beta}_j + \varepsilon_{ij} \quad (2)$$

where $Y_{ij}$ is cognitive skills or externalizing behavior problems for child *i* in group *j* (either a biological- or social-father family or a married- or cohabiting-parent family), $\boldsymbol{X}_{ij}$ is a vector of observed predictors (marital status or father biological status and the covariates) and a constant, $\boldsymbol{\beta}_j$ is a vector of slope parameters and the intercept for group *j*, and ε is the error term. Separate regressions are estimated for each group. We must then make an assumption regarding which model represents the "true" structural model of associations of the covariates with the outcomes that would exist in the absence of differences in returns to these factors (coefficients) between the two groups. In other words, the estimates (coefficients) from that (the "true") model are those that would be expected for both groups if there were no differences in returns to the covariates. We assume that the models for biological-father families and for married-parent families represent the "true" structural models and that, ideally, returns to the characteristics, resources, relationships, and parenting practices of social-father families would be equivalent to those for biological-father families, and those for cohabiting-parent families would be equivalent to those for married-parent families. This is a reasonable assumption given that: (1) in general,

biological- and married-parent families are viewed as the most beneficial family types for children, and (2) several bodies of theory imply that biological- and married-parent families' characteristics, resources, relationships, and parenting practices are likely to be more efficiently transferred to children as well as to elicit more receptivity from children than is the case in social- and cohabiting-parent families. Given this assumption, the difference in child cognitive skills or behavior problems between biological- (*BF*) and social-father (*SF*) families, for example, is:

$$\bar{Y}_{BF} - \bar{Y}_{SF} = \bar{X}_{BF}^{'}\hat{\beta}_{BF} - \bar{X}_{SF}^{'}\hat{\beta}_{SF} \quad (3)$$

where the between group difference in the outcome is separated into a component that is due to group differences in the predictors ($\bar{X}$) and a component that is due to group differences in returns to the predictors ($\hat{\beta}$). The decomposition then takes the following form:

$$\bar{Y}_{BF} - \bar{Y}_{SF} = (\bar{X}'_{BF} - \bar{X}'_{SF})\hat{\beta}_{BF} - \bar{X}'_{SF}\left(\hat{\beta}_{BF} - \hat{\beta}_{SF}\right) \quad (4)$$

such that $(\bar{X}'_{BF} - \bar{X}'_{SF})\hat{\beta}_{BF}$ represents the proportion of the difference in the outcome that is due to mean differences in the predictors (commonly termed the "explained" component) and $\bar{X}'_{SF}\left(\hat{\beta}_{BF} - \hat{\beta}_{SF}\right)$ represents the proportion of the difference in the outcome that is due to the difference in the coefficients or returns to the predictors (the "unexplained" component). We perform the same decomposition for married- and cohabiting-parent families using the married-parent family model as the reference model.

To test the robustness of our results to the assumption that the biological-father and married-parent family models represent the "true" underlying structural model, we re-estimated each model under the assumption that the "true" underlying model is a pooled model of the two groups when estimated with the inclusion of a group indicator variable (Elder, Goddeeris, & Haider, 2010). Results (not shown) were consistent with those from our primary decompositions.

Finally, we caution that the decomposition results are no more likely to reflect causal estimates than are the OLS results. That is, these results may, too, be biased by omitted variables.

## RESULTS

### *Descriptive statistics*

Descriptive statistics for the outcome measures are presented in Table 1. The raw data reveal that the mean PPVT and WJ-LW scores for children living in a biological-father family at age 5 are .32 and .20 standard deviations (SDs) higher than those for children in a social-father family. Children living with their biological father also exhibit an average of .16 SDs fewer internalizing and .29 SDs fewer externalizing behavior problems. Turning to marital status, children in married-parent families have average cognitive skills scores that are .50 and .33 SDs higher on the PPVT and WJ-LW than those of children in cohabiting-parent families. The former also exhibit, on average, .24 and .29 SDs fewer internalizing and externalizing behavior problems. Considering both father biological status and parental marital status, we see that children in married biological-father families have higher PPVT and WJ-LW scores than children in each of the other family types. Mean cognitive skills scores for children in the other family types do not significantly differ from one another, with the exception that children in cohabiting social-father families have lower PPVT scores than those in married social-father families. Children in married biological-father families have fewer internalizing behavior problems than those in cohabiting biological-father and cohabiting social-father families. They also have fewer externalizing behavior problems than those in all other family types. In addition, children in cohabiting social-father families have more externalizing behavior problems than those in cohabiting biological-father families.

A potential explanation for these differences is that the characteristics and experiences of

these family types differ in systematic ways that are related to children's cognitive skills and behavior problems. The descriptive statistics in Table 2 confirm that there are such differences. For example, social-father families are generally less advantaged than biological-father families: the focal child's parents are less likely to have been married (or even romantically involved) at the birth, and they have younger and less educated mothers whose parents had more mental health problems. Children in social father families have also experienced more family structure transitions and residential moves, and a much shorter duration of father coresidence. At age 5, their families have less income and more children; also, their mothers have higher levels of depressive symptoms and engage in more frequent spanking. However, several differences favor social-father families: these families score .37 SDs higher in terms of how the father treats the mother and .20 SDs higher in terms of coparenting quality; social fathers also engage in considerably (.41 SDs) less spanking than biological fathers. There are no differences by family type in mother or father engagement with the focal child.

Considering differences between married- and cohabiting-parent families, we find that married-parent families are more advantaged and their children have experienced less instability. At the same time, we see no differences in family relationships and parenting practices at age 5, with the sole exception that married fathers engage in more frequent spanking than cohabiting fathers. We take these differences into account in our regression and decomposition models.

### *OLS Regressions*

Table 3 presents our OLS regression results. Model 1 is a regression of the (standardized) cognitive skills or behavior problems score on the indicators for father type and marital status, without controls. On average, we see that, holding marital status constant, children living with a social father have PPVT scores that are .12 SDs (marginally significant at $p < .10$) lower and

externalizing behavior problems that are .21 SDs higher than those of children living with their biological father. Children in married-parent families have PPVT and WJ-LW scores that are .45 and .30 SDs higher, and internalizing and externalizing behavior problems that are .20 and .18 SDs lower, than children in cohabiting-parent families (holding father biological status constant).

Model 2 controls for the lagged dependent variable. This reduces the coefficient for social-father family to non-significance with regard to the PPVT, but has a relatively limited influence on this coefficient with regard to externalizing behavior problems, reducing it only from .21 to .18. Furthermore, it has a large influence on the married-family coefficients reducing the coefficient for PPVT by 29%, that for internalizing behavior problems by 70% (and nonsignificance), and that for externalizing behavior problems by 28%. Because the WJ-LW was not administered at age 3, we could not adjust for a lagged dependent variable in that model.

Antecedent characteristics (exogenous selection factors) are added in Model 3. This reduces the social-father family coefficient for externalizing behavior problems by an additional 28%, though it retains statistical significance. At the same time, the coefficient on internalizing behavior problems is increased by 83% and becomes marginally significant. Each of the coefficients for married-parent family is attenuated substantially (by 31% to 83%), although three of the four (all but internalizing behavior problems) remain at least marginally significant. These findings support the argument that much—though not all—of the difference in outcomes by family type is due to selection into different family structures. Model 4 controls for family (in)stability. The addition of these covariates has little influence on the social-father or married family coefficients.

Model 5 adds concurrent characteristics, economic resources, family relationships, and parenting practices. The addition of these covariates has little influence on the social-father

family coefficients for cognitive skills or on the married-parent family coefficients for behavior problems or the PPVT. However, it serves to attenuate the married-parent family coefficient for the WJ-LW by about a third and to reduce it to nonsignificance. Moreover, the introduction of these variables has a large suppressor effect with regard to the social-father family coefficients for behavior problems, such that the magnitude of these coefficients more than doubles and they become statistically significant. In fact, the social-father family coefficients become considerably larger than was the case in the simplest model (Model 1). This finding implies that, were it not for relatively high quality characteristics, economic resources, family relationships, and parenting practices in social-father families, behavior problems gaps between children in biological- and social-father families would be much greater. Indeed, an examination of the coefficients for the covariates (not shown) reveals that several factors that favor social-father families, including the father's overall treatment of the mother, coparenting quality, and less frequent spanking by both mothers and fathers are associated with fewer child behavior problems.

The final model in Table 3 (Model 6) presents results from the extension of Model 5 in which we employ family type indicators that constitute a full interaction between father biological status and parental marital status. For cognitive skills, residence in a cohabiting social-father family is associated with lower PPVT scores relative to residence in a married biological-father family; however, PPVT scores do not differ for children in married biological-father and married social-father families. We also find no differences in PPVT scores between children in any of the other family types; nor do we find any differences in WJ-LW scores by family type. Turning to behavior problems, children living in both married and cohabiting social-father families have greater internalizing and externalizing behavior problems than those living in

married and cohabiting biological-father families. However, there are no differences by marital status for children in either a biological- or social-father family.

Finally, we conducted Wald tests of whether the marriage-cohabitation gap for biological-father families was equal to the marriage-cohabitation gap for social-father families. In all cases, the test was nonsignificant, suggesting that the magnitude of the gap between children living in married and cohabiting biological-father families does not differ from the gap between children living in married and cohabiting social-father families. In short, the influence of marriage for each outcome appears to be the same in biological- and social-father families.

*Explanatory Power of the Covariates*

Table 4 presents a summary of the marginal contribution of each set of covariates to the adjusted R-squared of the full model. This allows for an explicit examination of the extent to which compositional differences in each set of factors explains variation in child cognitive skills and behavior problems. When interpreting these results, it is important to keep in mind that the marginal contributions are calculated after controlling for all other covariates (including those that are endogenous). This implies that we are measuring the explanatory power of the direct effect of each set of variables, but not necessarily any indirect effects that function through other variables that are already included in the model. These results suggest several interesting patterns. First, we see that, after controlling for all of the covariates (including lagged dependent variables), the family structure variables contribute very little additional explanatory power with regard to behavior problems, and no additional explanatory power with regard to cognitive skills. Second, as expected, the lagged dependent variables contribute extensive explanatory power. Third, net of the other covariates  the antecedent characteristics contribute considerable explanatory power with regard to cognitive skills but little to no explanatory power with regard

to behavior problems. Fourth, after accounting for all of the other factors, family (in)stability, for the most part, offers no additional explanatory power. Finally, concurrent characteristics, economic resources, family relationships, and parenting practices contribute modest explanatory power with regard to the PPVT, for which a lagged dependent variable is included, and considerable explanatory power with regard to the WJ-LW, for which we do not have a lagged measure; they also have substantial explanatory power with regard to (particularly internalizing) behavior problems. We also see that concurrent family characteristics and economic resources are more important than family relationships and parenting practices with regard to cognitive skills, whereas relationships and parenting practices are more important with regard to behavior problems. As noted above, the fathers' overall treatment of the mother, coparenting quality, and spanking frequency appear to be particularly important in this regard.

### *Blinder-Oaxaca Decompositions*

The decomposition results are shown in tables 5 (decomposition by father's biological status) and 6 (decomposition by parental marital status).Whereas the results presented thus far are useful for understanding how compositional differences in each set of covariates help to explain gaps in child outcomes by family type, they do not provide insight into whether children are differentially influenced by these factors across family types. Our decomposition analyses explicitly address this possibility. The top panel of each table presents the mean difference between family types for each outcome. The bottom panels show decomposition results for Model 2, which adjusts for either marital status or father's biological status and the lagged dependent variable, Model 3, which adds antecedent characteristics, Model 4, which adds family (in)stability, and Model 5, which adds concurrent characteristics, economic resources, family relationships, and parenting practices.

The overall pattern of results suggests that differences in child cognitive skills by father's biological status largely reflect compositional differences in the covariates between family types rather than differences in returns to these factors. For example, the Model 5 results for the PPVT and WJ-LW suggest that 78% and 86% of the mean difference in cognitive skills is due to differences in antecedent characteristics, family (in)stability, and concurrent characteristics, economic resources, family relationships, and parenting practices, whereas only 22% and 14% respectively is due to differences in returns to these factors. In contrast, differences in behavior problems are largely due to differences in returns to these factors across family types rather than compositional differences therein. Indeed, the results from Model 5 indicate that 192% of the difference in internalizing behavior problems and 91% of the difference in externalizing behavior problems is due to differences in returns to the covariates, whereas -92% and 9% of the gap is due to compositional differences in these factors between family types. This means that, were social-father families to have the same antecedent characteristics, family (in)stability, and concurrent characteristics, economic resources, family relationships, and parenting practices as biological-father families, then children in social-father families would exhibit .31 and .27 SDs *more* internalizing and externalizing behavior problems than those in biological-father families, whereas were social-father families to realize the same returns to (coefficients for) these factors as biological-father families, then children in social-father families would exhibit .15 SDs *fewer* internalizing and only .03 SDs *more* externalizing behavior problems than those in biological-father families.

On the whole, children in biological-father families experience greater (aggregated) returns to the full set of covariates, in terms of reduced behavior problems, than those in social-father families. A comparison of the coefficients from the separate regression models for

biological- and social-father families (not shown) reveals, for example, that maternal education and family income have stronger inverse associations with internalizing behavior problems for children in biological-father families than for those in social-father families. At the same time, maternal depression and father spanking have weaker positive associations with both internalizing and externalizing behavior problems for children in biological-father families. Yet, there are also a few exceptions to this general pattern. Most notably, both the father's overall treatment of the mother and the couple's coparenting quality have stronger inverse associations with behavior problems for children in social-father families than for those in biological-father families.

The results from Model 5 also indicate that mean differences in the covariates explain a negative portion of the gap in internalizing behavior problems. This implies that (and is typically the case when) the group with worse mean behavior problems (social-father families) possesses a relative advantage with regard to some of the observable covariates (Sinning, Hahn, & Bauer, 2008). As noted above, social-father families fare better, on average, in areas such as the father's overall treatment of the mother, coparenting quality, and spanking frequency, whereas biological-father families have higher levels of income and parental (particularly maternal) education.

In contrast to the decomposition results by father's biological status, those by marital status (Table 6) reveal that the mean difference between married- and cohabiting-parent families for each of the outcomes is predominantly driven by compositional differences in the covariates, as opposed to differences in returns to these factors across family types. Mean differences in the covariates explain 70% of the gap between children living with married parents and those living with cohabiting parents for the PPVT, 88% for the WJ-LW and 121% and 69% for internalizing

and externalizing behavior problems.

## DISCUSSION

Consistent with prior research, our results show that: (1) there are considerable mean differences in antecedent characteristics, family (in)stability, and concurrent characteristics, economic resources, family relationships, and parenting practices across family types (Berger et al., 2008; Bzostek et al., 2012; Gibson-Davis, 2008; Hofferth & Anderson, 2003; Hofferth, 2006; Manning & Brown, 2006; Manning & Lichter, 1996; McLanahan & Sandefur, 1994); (2) children living with married biological parents exhibit greater cognitive skills and fewer behavior problems than children in other family types (Artis, 2007; Brown, 2004a; Hofferth, 2006); and (3) children in all other family types tend to have similar levels of cognitive skills and behavior problems to one another (Artis, 2007; Brown, 2004a; Hofferth, 2006; Manning & Lamb, 2003). At the same time, we find that differences in cognitive skills and behavior problems between (married) biological-father families and the other family types are not always large (nor statistically significant), and that estimates vary considerably depending on the covariates included in the regression models.

We first examined the extent to which differences in cognitive skills and behavior problems reflect differences economic resources, family relationships, and parenting practices (net of antecedent and concurrent family characteristics and prior family instability), as well as which of these factors are most important in accounting for differences in outcomes by family type. On the whole, we find that adjusting for the full set of covariates accounts for most of the association between family type and cognitive skills but little of the association between family type and behavior problems. Yet, an examination of the influence of each set of covariates tells a more complex story.

As would be expected, the inclusion of a lagged dependent variable in the regression models explains a large portion of the variation in each outcome. Net of such adjustment, however, we find that antecedent family characteristics play a large explanatory role with regard to cognitive skills. Their inclusion in the models results in a considerable attenuation of the associations of both living in a social-father family and living in a married-parent family with cognitive skills, but explains little of the variation in behavior problems. In contrast, concurrent family characteristics, economic resources, family relationships, and parenting practices are more closely linked to variation in behavior problems than cognitive skills. This indicates that the roles of particular types of covariates differ considerably across outcomes, and in important ways.

That the role of antecedent characteristics is particularly large with regard to cognitive skills is not surprising given that these characteristics include parent education and family structure at birth, both of which are strongly associated with cognitive ability. The fact that the estimated associations of living in a social-father family and behavior problems are attenuated after adjusting for antecedent characteristics, but increase substantially when concurrent family characteristics, economic resources, family relationships, and parenting practices are added to the models reflects two counteracting influences: social-father families are worse off than biological-parent families with respect to antecedent characteristics (as well as some concurrent factors, such as family income at age 5), but better off with respect to concurrent family relationships and parenting practices. In short, were it not for relatively high quality family relationships and parenting practices (and, to a lesser extent, some concurrent family characteristics) in social-father families (Berger et al., 2008), children in these families would have considerably higher levels of behavior problems. Future research should explore whether this hypothesis holds for

children of different ages and for families with different levels of socioeconomic (dis)advantage.

In addition, we find that family (in)stability since birth does not account for any of the association of family type with either cognitive or behavioral outcomes, and explains virtually none of the variation in either outcome once the lagged dependent variables and full set of covariates are controlled. Thus, instability must be operating through the covariates. This finding is inconsistent with findings from prior literature which suggest that family instability is linked to poor developmental outcomes (Brown 2010; Sweeney 2010). However, most prior studies have been unable to simultaneously adjust for the wide range of antecedent characteristics, concurrent characteristics, economic resources, family relationships, and parenting practices that we include in our models. Thus, it may be that the inclusion of this extensive set of covariates, many of which are correlated with both family (in)stability and child outcomes, serves to explain observed associations between family (in)stability and child outcomes.

We also examined whether marriage is differentially associated with child outcomes in biological- and social-father families and find no significant difference in the marriage-cohabitation gap between children living with a biological or social father for any outcome. Prior research has not established a consistent pattern of evidence in this area (Artis, 2007; Brown, 2004a; Hofferth, 2006; Manning & Lamb, 2003; Smock, 2000), and many existing studies have lacked substantial samples of lower-SES families. Our results suggest that, at least among the relatively disadvantaged families in the FFCW sample, the marriage premium is similar for children in biological- and social-father families with regard to the cognitive skills and behavior problems we examined.

The primary contribution of this study is to examine whether there are differential returns to concurrent family characteristics, economic resources, family relationships, and parenting

practices between biological- and social-father and married- and cohabiting-parent families. Here, we find consistent evidence that differences in cognitive skills are predominantly driven by differences in antecedent characteristics of the parents in these family types and, to a lesser extent, differences in concurrent characteristics, economic resources, family relationships, and parenting practices. We find little evidence that differences in returns to these factors are important in driving gaps in children's cognitive skills across family types. This finding holds true for differences in cognitive skills by both father's biological status and parental marital status. In other words, although there are considerable differences in characteristics, economic resources, family relationships, and parenting practices across family types, the associations between these factors and child wellbeing are similar. This finding, in concert with our finding that antecedent characteristics have the greatest explanatory power with regard to cognitive skills, implies that differences in cognitive skills by family type are due largely to social selection. We reach the same general conclusion with regard to differences in behavior problems between children in married- and cohabiting-parent families.

In contrast, we find that differences in behavior problems between children in biological- and social-father families primarily reflect differences in returns to characteristics, economic resources, family relationships, and parenting practices, suggesting that differences in family processes matter for this outcome. This finding may reflect that social capital is lower in social-father families than in biological-father families or that children respond differently to investments in each family type. Unfortunately, our empirical analyses cannot distinguish which may be the driving factor. Also, we cannot fully discount that these differences may reflect omitted variable bias, despite the wide range of covariates included in our models. Given that ours is the first study to explicitly focus on differences in returns to characteristics, economic

resources, family relationships, and parenting practices, it will be important for future research to more fully examine whether and how variation in social capital and family processes across family types may influence the socialization process and the transmission of human capital to children. Along these lines, it will also be important for future research to seek a better understanding of both what drives compositional differences in family relationships and parenting practices and what drives differences in the ways these factors influence children in different family types.

Several limitations of our analyses warrant consideration. First, we examine only static, short-term cognitive and social-emotional outcomes for children at age 5 and do not take a dynamic approach to changes in family structure over time and their influence on child wellbeing. Although we find static differences in child outcomes by family type, even after adjusting for lagged measures of the outcomes, it is possible that these associations may at least partially reflect relatively recent family structure transitions given that the children in our sample are still young. To the extent that these associations are linked to family transitions, rather than to residence in a particular family type, they may fade over time. If so, our estimates may overestimate adverse associations between social-father family type and child wellbeing (or underestimate any positive influences of social-father families). Notably, however, accounting for prior family instability has little influence on our findings once antecedent family characteristics are taken into account.

It is also possible that the high quality relationships observed among the social-father families in our sample reflect a "honeymoon" effect, which may fade over time, given that these partnerships are relatively new. At the same time, it may be that the relatively high quality relationships and parenting practices in these families indicate that mothers are selective in

choosing social fathers for their children. This hypothesis is consistent with recent findings by Bzostek and colleagues (2012), which suggest that mothers tend to "trade-up" when choosing new partners, as well as those by Berger and colleagues (2008), which imply that social fathers appear to engage in relatively high quality parenting practices. Unfortunately, our analyses cannot disentangle these possibilities. It will therefore be important for future studies to examine the long-term associations of these factors with child outcomes, particularly in a context of high rates of both social-father and cohabiting families, which tend to be less stable than (particularly two-biological) married-parent families (Manning, Smock, & Majumdar, 2004; Osborne & McLanahan, 2007). Finally, younger children may be more likely than older children to form bonds with social fathers (Bray, 1999; Schmeekle et al. 2006) and, thereby, may benefit more from social-father investments than older children, which may also be reflected in our results.

Second, our behavior problems measures are reported by mothers. As such, it is possible that our estimates reflect variation in mothers' perceptions of child behavior in different family types rather than true differences in child behavior between families. Likewise, we utilize only maternal reports of father attributes, family relationships, and parenting practices; our results may therefore be biased if there are systematic differences in mothers' reports with respect to resident biological and resident social fathers. Third, our family relationships and parenting practices measures are limited in scope and may lack the sensitivity or specificity to fully capture differences between family types across the multifaceted aspects of intra-family processes. Fourth, there may be considerable heterogeneity in effects that is obscured in our analyses. In particular, the relations of interest may differ by SES as well as child gender and race/ethnicity. Fifth, like most studies in this area, we model children's developmental outcomes as a function of family characteristics, economic resources, family relationships, and parenting practices, but

do not consider potential bi-directionality in these relations. Yet, child cognitive skills or behavior problems may also influence parent-child relationships and parental behaviors (Carlson & Magnuson, 2011). For example, there is likely to be a reciprocal relationship between parent-child conflict and externalizing behavior problems (Burt, McGue, Krueger, & Iacono, 2005). Finally, as noted above, although our models take advantage of the wide range of detailed measures of family characteristics and functioning that are available in FFCW, as with all observational studies it is possible that our estimates are biased by omitted factors.

Despite these caveats, our analyses offer new evidence regarding the potential influence of antecedent characteristics, family (in)stability, and concurrent characteristics, economic resources, family relationships, and parenting practices on associations of family type with cognitive skills and behavior problems for young children from primarily disadvantaged families. On the whole, we find that marriage, in general, is positively associated with child cognitive outcomes and inversely associated with child behavior problems at age 5. In both instances, most of the association is due to differences in antecedent characteristic, suggesting that selection into marriage or cohabitation is largely driving differences in child outcomes. We also find that the gains associated with living with married parents are similar for children biological- and social-father families.

The story for father biological status is more complex. Whereas the father's biological status is not associated with cognitive skills at age 5, living with a social father is linked to behavior problems, but in offsetting ways. On one hand, social-father families have lower socioeconomic status than biological-father families, which is associated with more behavior problems; one the other hand, social-father families exhibit relatively high quality family relationships and parenting practices, both of which are associated with fewer behavior

problems. Furthermore, the aggregate returns to family characteristics, economic resources, family relationships, and parenting practices tend to be more favorable for children in biological-father families than those in social-father families with regard to behavior problems. In particular, children living with their biological father are less negatively affected by limited resources and more positively affected by high quality parental characteristics and parenting practices. However, we also identify several important exceptions to this general pattern; in particular, high quality parental relationships and mother-father coparenting behaviors are associated with greater reductions in child behavior problems in social-father families than in biological-father families. Future research should further examine the potential mediating or suppressor roles of family relationships and parenting practices by mothers, resident and nonresident biological fathers, and social fathers, both over time and for more diverse groups of children in terms of age and socioeconomic status. It should also seek additional information on the processes through which antecedent characteristics, family (in)stability, and concurrent characteristics, economic resources, family relationships, and parenting practices may differentially influence children's behavior in various family types.

## REFERENCES

Achenbach, T.M. (1991). *Manual for the Child Behavior Checklist /4-18 and 1991 Profile.* Burlington, VT: University of Vermont, Department of Psychiatry.

Adamsons, K., O'Brien, M., & Pasley, K. (2007). An Ecological approach to father involvement in biological and stepfather families. *Fathering*, 5, 129-147.

Artis, J. E. (2007). Maternal cohabitation and child well-being among kindergarten children. *Journal of Marriage and Family*, 69, 222-236.

Berger, L. M. (2007). Socioeconomic factors and substandard parenting. *Social Service Review*, 81(3), 485-522.

Berger, L. M., Carlson, M. J., Bzostek, S. H., & Osborne, C. (2008). Parenting practices of resident fathers: The role of marital and biological ties. *Journal of Marriage and Family*, 70, 625-639.

Berger, L. M., & Langton, C. (2011). Young disadvantaged men as fathers. *Annals of the American Academy of Political and Social Science*, 635, 56-75.

Blinder, A. S. (1973). Wage discrimination: Reduced form and structural estimates. *The Journal of Human Resources*, 8, 436-455.

Bray, J. H. (1999). Stepfamilies: The intersection of culture, context, and biology. *Monographs of the Society for Research on Child Development*, 64, 210-218.

Brown, S. L. (2004a). Family structure and child well-being: The significance of parental cohabitation. *Journal of Marriage and Family, 66*, 351-367.

Brown, S. L. (2004b). Moving from cohabitation to marriage: Effects on relationship quality. *Social Science Research*, 33, 1-19.

Brown, S. L. (2006). Family structure transitions and adolescent well-being. *Demography* 43 (3): 447–61.

Brown, S.L. (2010). Marriage and child well-being: Research and policy perspectives. *Journal of Marriage and Family*, 72, 1059-1077.

Bruce, C. & Fox, G. L. (1999). Accounting for patterns of father involvement: Age of child, father-child coresidence, and father role salience. *Sociological Inquiry*, 69, 458-476.

Burt, S. A., McGue, M., Krueger, R. F., & Iacono, W. G. (2005). How are parent-child conflict and childhood externalizing symptoms related over time? Results from a genetically informative cross-lagged study. *Development and Psychopathology*, 17, 145-165.

Bzostek, S. (2008). Social fathers and child well-being. *Journal of Marriage and Family*, 70, 950-961.

Bzostek, S. H., McLanahan, S., & Carlson, M.J. (2012). Mothers' repartnering after a nonmarital birth. *Social Forces*, 90, 817-841.

Carlson, M.J. (2007). Trajectories of couple relationship quality after childbirth: Does marriage matter? Working paper #2007-11-FF. Princeton University, Center for Research on Child Wellbeing.

Carlson, M. J., & Magnuson, K.A. (2011). Low-income fathers' influence on children. *Annals of the American Academy of Political and Social Science*, 635, 95-116.

Carlson, M. J., Pilkauskas, N., McLanahan, S. S., & Brooks-Gunn, J. (2011). Couples as partners and parents over children's early years. *Journal of Marriage and Family,* 73, 317-334.

Cherlin, A. (1978). Remarriage as an incomplete institution. *American Journal of Sociology*, *84*, 634-650.

Cherlin, A. J., & Furstenberg, F. F., Jr. (1994). Stepfamilies in the United States: A

reconsideration. *Annual Review of Sociology, 20*, 359-381.
Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, S95-S120.
Coleman, M., Ganong, L. & Fine, M. (2000). Reinvestigating remarriage: Another decade of progress. *Journal of Marriage and the Family, 62*, 1288 - 1307.
Cooper, C.E., Osborne, C.A., Beck, A.N., & McLanahan, S. S. (in press). Partnership instability, school readiness, and gender disparities. *Sociology of Education.*
Daly, M., & Wilson, M. I. (2000). The Evolutionary psychology of marriage and divorce. In L. J. Waite (Ed.), *The ties that bind: Perspectives on marriage and cohabitation* (pp. 91-110). New York: Aldine de Gruyter.
Duncan, G., & Magnuson, K. (2011). The nature and impact of early achievement skills, attention and behavior problems. In G. Duncan & R. Murnane (eds). *Social Inequality and Educational Disadvantage*. NY: Russell Sage Foundation.
Dunn, L.M. and L.M. Dunn (1997). *Examiner's Manual for the Peabody Picture Vocabulary Test, Third Edition.* American Guidance Services, Inc. Elder, T. E., Goddeeris, J.H., & Haider, S.J. (2010). Unexplained gaps and Oaxaca-Blinder decompositions. *Labour Economics*, 17, 284-290.
Eccles, J. S. (1999). The development of children ages 6 to 14. *Future of Children*, 9, 30 – 44.
Edin, K., & Kefalas, M. (2005). *Promises I can keep: Why poor women put motherhood before marriage.* Los Angeles: University of California Press.
Eggebeen, D. J. (2005). Cohabitation and exchanges of support. *Social Forces* 83 (3): 1097–1110.
Elder, T. E., Goddeeris, J. H., & Haider, S.J. (2010). Unexplained gaps and Oaxaca–Blinder decompositions. *Labour Economics*, 17, 284–290.
Fine, M. A. & Kurdek, L.A. (1995). Relation between marital quality and (step)parent-child relationship quality for parents and stepparents in stepfamilies. *Journal of Family Psychology*, 9, 216-223.
Fomby, P. & Cherlin, A. J. (2007). Family instability and child well-being. *American Sociological Review*, 72, 181-204.
Foster, E. M., & Kalil, A. (2007). Living arrangements and children's development in low-income white, black, and Latino families.*Child Development*, 78, 1657-1667.
Furstenberg, F. F., & Cherlin, A. (1991). *Divided families: What happens to children when parents part*. Cambridge: Harvard University Press.
Ganong, L., Coleman, M., Fine, M., & Martin, P. (1999). Stepparents' affinity-seeking and affinity-maintaining strategies with stepchildren. *Journal of Family Issues*, 20, 299-327.
Gibson-Davis, C. (2008). Family structure effects on maternal and paternal parenting in low-income families. *Journal of Marriage and Family*, 70, 452-465**.**
Hanson, T. L., McLanahan, S. S., & Thomson, E. (1996). Double jeopardy: Parental conflict and stepfamily outcomes for children. *Journal of Marriage and Family*, 58, 141-154.
Hetherington, E. M., Henderson, S. H., & Reaiss, D., in collaboration with Anderson, E. R., Bridges, M., Chan, R. W., Insabella, G. M., Jodl, K. M., Jungmeen, E., Mitchell, A. S., O'Connor, T. G., Skaggs, M. J., & Taylor, L. C. (1999). Adolescent siblings in stepfamilies: Family functioning and adjustment. With commentary by J. H. Bray. *Monographs of the Society for Research in Child Development*, 64.
Hofferth, S. L. (2006). Residential father family type and child well-being: Investment versus selection. *Demography, 43*, 53-77.
Hofferth, S. L., & Anderson, K.G. (2003). Are all dads equal? Biology versus marriage as a basis

for paternal investment. *Journal of Marriage and Family*, 65, 213-232.
Hofferth, S. L., Cabrera, N., Carlson, M., Coley, R.L., Day, R. & Schindler, H. (2007). Resident father involvement and social fathering. In S. L. Hofferth & L. M. Casper (Eds.), *Handbook of measurement issues in family research* (pp. 335-374). Mahwah, NJ: Lawrence Erlbaum.
Kessler, R., Andrews, G. , Mroczek, D., Ustun, T., & Wittchen, H. U. (1998). The World Health Organization Composite International Diagnostic Interview Short Form (CIDI-SF). *International Journal of Methods in Psychiatric Research,* 7, 171-185.
King, V. (2006). The antecedents and consequences of adolescents' relationships with stepfathers and nonresident fathers. *Journal of Marriage and Family*, 68, 910-928.
Klausli, J. F., & Owen, M. T. (2009). Stable maternal cohabitation, couple relationship quality, and characteristics of the home environment in the child's first two years. *Journal of Family Psychology*, 23, 103-106.
Kowaleski-Jones, L., & Duncan, G. (1999). The structure of achievement and behavior across middle childhood. *Child Development*, 70, 930 – 943.
Kreider, R. M. (2008). *Living arrangements of children: 2004.* U.S. Census Bureau, Current Population Reports, P70-114, Washington, DC.
Magnuson, K. & Berger, L.M. (2009). Associations of family structure states and transitions with children's wellbeing during middle childhood. *Journal of Marriage and Family*, 71, 575-591.
Manning, W. D., & Brown, S. (2006). Children's economic well-being in married and cohabiting parent families. *Journal of Marriage and Family*, 68, 345-362.
Manning, W. D., & Lamb, K. A. (2003). Adolescent well-being in cohabiting, married, and single-parent families. *Journal of Marriage and Family*, 65, 876-893.
Manning, W. & Lichter, D.T. (1996). Parental cohabitation and children's economic well-being. *Journal of Marriage and the Family*, 58, 998-1010.
Manning, W. D., Smock, P. J., & Majumdar, D. (2004). The relative stability of cohabiting and marital unions for children. *Population Research and Policy Review*, 23, 135-159.
Marsiglio, W. (2004). When stepfathers claim stepchildren: A conceptual analysis. *Journal of Marriage and Family*, 66, 22-39.
Marsiglio, W. & Hinojosa, R. (2010). Stepfathers' lives: Exploring the social context and interpersonal complexity. In M. Lamb (Ed.) *The Role of the Father in Child Development, Fifth Edition*. Hoboken, NJ: John Wiley & Sons, Inc.
Maume, D. J. (2011). Reconsidering the temporal increase in fathers' time with children. *Jouranl of Family and Economic Issues*, 32, 411-423.
McLanahan, S., & Sandefur, G. (1994). *Growing Up with a Single Parent: What Hurts? What Helps?* Cambridge, MA: Harvard University Press.
Nelson, T. J. (2004). Low-income fathers. *Annual Review of Sociology*, 30, 427-451.
Nock, S. L. (1995). A comparison of marriages and cohabiting relationships. *Journal of Family Issues*, 16, 53-76.
Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International Economic Review*, 14, 693-709.
Osborne, C., & McLanahan, S. (2007). Partnership instability and child wellbeing. *Journal of Marriage and Family*, 69, 1065-1083.
Reichman, N. E., Teitler, J. O., Garfinkel, I., & McLanahan, S. S. (2001). Fragile Families: Sample and design. *Children and Youth Services Review*, 23, 303-326.
Schmeeckle, M., Giarrusso, R., Feng, D., & Bengtson, V. L. (2006). What makes someone

family? Adult children's perceptions of current and former stepparents. *Journal of Marriage and Family*, 68, 595-610.

Sigle-Rushton, W., & McLanahan, S. (2004). Father absence and child well-being: A critical review. In D. P. Moynihan, T. M. Smeeding, & L. Rainwater (Eds.), *The Future of the Family* (pp. 116-155). New York: Russell Sage Foundation.

Sinning, M., Hahn, M., & Bauer, T. K. (2008). The Blinder-Oaxaca decomposition for nonlinear regression models. *The Stata Journal*, 8, 480-492.

Smock, P. J. (2000). Cohabitation in the United States: An appraisal of research, themes, findings, and implications. *Annual Review of Sociology*, 26, 1-20.

Stewart, S. D. (2005). Boundary ambiguity in stepfamilies. *Journal of Family Issues*, 26, 1002-1029.

Sweeney, M. M. (2010). Remarriage and stepfamilies: Strategic sites for family Scholarship in the 21st century. *Journal of Marriage and Family*, 72, 667-684.

Townsend, N. W. (2002). *The Package Deal: Marriage, Work and Fatherhood in Men's Lives*. Philadelphia: Temple University Press.

Von Hippel, P. T. (2007). Regression with missing Ys: An improved strategy for analyzing multiply imputed data. *Sociological Methodology*, 37, 83-117.

Woodcock, R.W., & Johnson, M.B. (1990). *Manual for the Woodcock-Johnson Tests of Achievement-Revised.* Allen, TX: RCL Enterprises.

Table 1: Descriptive statistics for cognitive skills and externalizing behavior problems, overall and by family type

| | All Biological-Father Families | All Social-Father Families | All Married Families | All Cohabiting Families | Married Biological-Father Families | Cohabiting Biological-Father Families | Married Social-Father Families | Cohabiting Social-Father Families |
|---|---|---|---|---|---|---|---|---|
| PPVT | 0.09 | -0.23[a] | 0.23 | -0.27[b] | 0.26 | -0.25[c] | -0.02[c] | -0.29[ce] |
| | (1.01) | (0.94) | (0.98) | (0.96) | (0.98) | (0.97) | (0.87) | (0.95) |
| Obs. per imputed dataset | 966 - 968 | 375 - 377 | 725 - 726 | 616 - 617 | 645 - 646 | 321 - 322 | 80 - 81 | 295 - 296 |
| Woodcock-Johnson | 0.06 | -0.14[a] | 0.15 | -0.18[b] | 0.18 | -0.18[c] | -0.07[c] | -0.17[c] |
| | (1.04) | (0.88) | (1.07) | (0.88) | (1.08) | (0.89) | (0.90) | (0.88) |
| Obs. per imputed dataset | 971 - 973 | 380 - 383 | 729 - 730 | 622 - 624 | 646 - 647 | 325 - 326 | 83 - 84 | 297 - 299 |
| Internalizing behavior problems | -0.04 | 0.12[a] | -0.09 | 0.13[b] | -0.11 | 0.12[c] | 0.07 | 0.13[c] |
| | (0.98) | (1.03) | (0.95) | (1.05) | (0.94) | (1.06) | (1.01) | (1.04) |
| Obs. per imputed dataset | 1277 - 1279 | 472 - 467 | 1009 - 1011 | 740 - 743 | 898 - 900 | 379 - 380 | 111 - 112 | 361 - 364 |
| Externalizing behavior problems | -0.08 | 0.21[a] | -0.11 | 0.15[b] | -0.14 | 0.05[c] | 0.08[c] | 0.25[cd] |
| | (0.95) | (1.09) | (0.91) | (1.10) | (0.90) | (1.04) | (0.91) | (1.14) |
| Obs. per imputed dataset | 1277 - 1279 | 472 - 467 | 1009 - 1011 | 740 - 743 | 898 - 900 | 379 - 380 | 111 - 112 | 361 - 364 |

Note: Means (and standard deviations) presented. All measures have been standardized to have a mean of 0 and standard deviation of 1 in the full sample. The number of observations per imputed dataset are: 1341 to 1343 for the PPVT, 1351 to 1354 for the Woodcock-Johnson, and 1749 to 1753 for internalizing and externalizing behavior problems.

[a]Differs from biological-father families at $p<0.05$.

[b]Differs from married families at $p<0.05$.

[c]Differs from married biological-father families at $p<0.05$.

[d]Differs from cohabiting biological-father families at $p<0.05$.

[e]Differs from married social-father families at $p<0.05$.

Table 2: Descriptive statistics for covariates, overall and by father's biological status and parental marital status

| | Biological-Father Families | Social-Father Families | Married Families | Cohabiting Families |
|---|---|---|---|---|
| *Family type at focal child age 5:* | | | | |
| Biological-father family | -- | -- | 0.89 | 0.51[b] |
| Social-father family | -- | -- | 0.11 | 0.49[b] |
| Married | 0.70 | 0.24[a] | -- | -- |
| Cohabiting | 0.30 | 0.76[a] | -- | -- |
| *Cognitive skills and behavior problems at age 3 (lagged dependent variables):* | | | | |
| PPVT | 0.10 | -0.26[a] | 0.18 | -0.24[b] |
| | (1.01) | (0.92) | (1.01) | (0.94) |
| Woodcock-Johnson | -- | -- | -- | -- |
| Internalizing behavior problems | -0.05 | 0.13[a] | -0.15 | 0.20[b] |
| | (0.98) | (1.04) | (0.94) | (1.04) |
| Externalizing behavior problems | -0.03 | 0.07 | -0.05 | 0.07[b] |
| | (0.98) | (1.04) | (0.98) | (1.02) |
| *Antecedent characteristics (exogenous selection factors):* | | | | |
| Married | 0.45 | 0.07[a] | 0.57 | 0.03[b] |
| Cohabiting | 0.39 | 0.33[a] | 0.28 | 0.51[b] |
| Dating | 0.02 | 0.10[a] | 0.03 | 0.05[b] |
| Not romantically involved | 0.15 | 0.50[a] | 0.12 | 0.41[b] |
| White | 0.31 | 0.17[a] | 0.37 | 0.14[b] |
| Black | 0.34 | 0.59[a] | 0.31 | 0.55[b] |
| Hispanic | 0.31 | 0.23[a] | 0.28 | 0.30 |
| Another race | 0.04 | 0.02[a] | 0.05 | 0.02 |
| Mother's Age | 26.74 | 22.83[a] | 27.31 | 23.46[b] |
| | (6.16) | (4.75) | (6.07) | (5.31) |
| US born | 0.78 | 0.95[a] | 0.79 | 0.87[b] |
| Less than high school education | 0.27 | 0.41[a] | 0.22 | 0.44[b] |
| High school education | 0.25 | 0.35[a] | 0.24 | 0.33[b] |
| More than high school education | 0.27 | 0.22[a] | 0.30 | 0.21[b] |
| Multiple partner fertility (age 1) | 0.26 | 0.46[a] | 0.25 | 0.40[b] |
| Mother's father MH problems (age 3) | 0.58 | 0.76 | 0.53 | 0.75 |
| | (1.71) | (1.77) | (1.71) | (1.74) |
| Mother's mother MH problems (age 3) | 0.80 | 1.07[a] | 0.81 | 0.96 |
| | (1.93) | (2.27) | (1.91) | (2.18) |
| Child female | 0.48 | 0.45 | 0.47 | 0.48 |
| Child low birth weight | 0.08 | 0.12[a] | 0.07 | 0.12[b] |
| *Family (in)stability:* | | | | |
| Number of family structure transitions | 0.32 | 1.54[a] | 0.34 | 1.08[b] |
| | (0.65) | (0.79) | (0.69) | (0.92) |
| Duration of mother-partner co-residence (months) | 106.31 | 23.53[a] | 104.87 | 55.12[b] |
| | (47.81) | (19.79) | (53.87) | (44.83) |
| Total residential moves | 1.53 | 2.58[a] | 1.52 | 2.21[b] |
| | (1.66) | (1.93) | (1.60) | (1.97) |
| *Concurrent characteristics, economic resources, family relationships, and parenting practices :* | | | | |
| *Characteristics and economic resources* | | | | |
| BF/SF age | 34.41 | 29.85[a] | 34.88 | 30.85[b] |
| | (7.08) | (7.04) | (6.97) | (7.22) |
| BF/SF less than high school | 0.27 | 0.08[a] | 0.19 | 0.26[b] |
| BF/SF high school | 0.29 | 0.67[a] | 0.30 | 0.52[b] |
| BF/SF more than high school | 0.25 | 0.19[a] | 0.27 | 0.18[b] |
| BF/SF has children with other woman | 0.29 | 0.52[a] | 0.26 | 0.47[b] |
| BF/SF other children with mom | 0.81 | 0.33[a] | 0.79 | 0.52[b] |

| | | | | |
|---|---|---|---|---|
| BF/SF has limiting condition | 0.05 | 0.09[a] | 0.06 | 0.07 |
| BF/SF ever incarcerated | 0.22 | 0.19 | 0.15 | 0.30[b] |
| Number of children | 2.56 | 2.73[a] | 2.57 | 2.66 |
| | (1.25) | (1.48) | (1.26) | (1.40) |
| Number of adults | 2.22 | 2.15 | 2.17 | 2.25[b] |
| | (0.70) | (0.64) | (0.60) | (0.78) |
| Income (ln) | 10.45 | 9.72[a] | 10.65 | 9.71[b] |
| | (1.24) | (1.41) | (1.05) | (1.47) |
| Mother depressive symptoms | -0.04 | 0.11[a] | -0.03 | 0.04 |
| (standardized) | (0.93) | (1.15) | (0.95) | (1.06) |
| *Family relationships and parenting practices* | | | | |
| BF/SF treatment of mother | -0.10 | 0.27[a] | 0.01 | -0.02 |
| (standardized) | (1.06) | (0.78) | (0.95) | (1.07) |
| Coparenting quality (standardized) | -0.05 | 0.15[a] | 0.02 | -0.01 |
| | (0.99) | (0.99) | (0.95) | (1.05) |
| Mother spanking frequency | -0.05 | 0.15[a] | -0.03 | 0.06 |
| (standardized) | (0.98) | (1.06) | (0.99) | (1.02) |
| Mother engagement with child | -0.02 | 0.06 | 0.01 | -0.01 |
| (standardized) | (1.00) | (1.00) | (1.00) | (1.00) |
| BF/SF spanking frequency | 0.12 | -0.29[a] | 0.09 | -0.11[b] |
| (standardized) | (1.08) | (0.68) | (1.06) | (0.92) |
| BF/SF engagement with child | -0.02 | 0.05 | -0.02 | 0.03 |
| (standardized) | (0.98) | (1.05) | (0.98) | (1.03) |
| Observations per imputed dataset | 1283 - 1285 | 479 - 484 | 1015 – 1017 | 747 - 751 |

Note: Means (and standard deviations) presented for continuous variables; percentages presented for dichotomous variables. The total number of observations per imputed dataset ranges from 1762 - 1767. The Woodcock-Johnson was not administered prior to age 5.

[a]Differs from biological-father families at $p<0.05$.

[b]Differs from married families at $p<0.05$.

Table 3: OLS regressions results

| | PPVT | Woodcock-Johnson | Internalizing Behavior Problems | Externalizing Behavior Problems |
|---|---|---|---|---|
| *Model 1: Family type at focal child age 5* | | | | |
| Social-father family | -0.12+ | -0.07 | 0.07 | 0.21*** |
| | (0.06) | (0.07) | (0.06) | (0.06) |
| Married family | 0.45*** | 0.30*** | -0.20*** | -0.18*** |
| | (0.06) | (0.06) | (0.05) | (0.05) |
| *Model 2:Add lagged (age 3) dependent variable* | | | | |
| Social-father family | -0.03 | -- | 0.06 | 0.18*** |
| | (0.06) | | (0.06) | (0.05) |
| Married family | 0.32*** | -- | -0.06 | -0.13** |
| | (0.05) | | (0.05) | (0.05) |
| *Model 3:Add antecedent characteristics (exogenous selection factors)* | | | | |
| Social-father family | -0.05 | -0.03 | 0.11+ | 0.13* |
| | (0.06) | (0.07) | (0.06) | (0.06) |
| Married family | 0.15* | 0.16* | -0.01 | -0.09+ |
| | (0.06) | (0.07) | (0.06) | (0.05) |
| *Model 4: Add family (in)stability* | | | | |
| Social-father family | -0.06 | 0.02 | 0.16* | 0.14* |
| | (0.08) | (0.09) | (0.08) | (0.07) |
| Married family | 0.15* | 0.15* | -0.02 | -0.09+ |
| | (0.06) | (0.07) | (0.06) | (0.05) |
| *Model 5: Add concurrent characteristics, economic resources, family relationships, and parenting practices* | | | | |
| Social-father family | -0.08 | -0.03 | 0.32*** | 0.29*** |
| | (0.09) | (0.09) | (0.08) | (0.08) |
| Married family | 0.13* | 0.10 | 0.00 | -0.08 |
| | (0.06) | (0.07) | (0.06) | (0.05) |
| *Model 6, Extension: Full model, father type interacted with marriage* | | | | |
| Cohabiting biological-father family | -0.11 | -0.11 | 0.04 | 0.07 |
| | (0.07) | (0.08) | (0.07) | (0.06) |
| Married social-father family | -0.04 | -0.07 | 0.41***[a] | 0.29**[a] |
| | (0.13) | (0.13) | (0.11) | (0.11) |
| Cohabiting social-father family | -0.21* | -0.13 | 0.32**[a] | 0.37***[a] |
| | (0.10) | (0.11) | (0.09) | (0.09) |
| *Wald test (p-value):* | | | | |
| $\beta_{COH\ BF} = (\beta_{COH\ SF} - \beta_{MAR\ SF})$ | .665 | 0.685 | 0.289 | 0.937 |
| Observations per imputed dataset | 1341 - 1343 | 1351 - 1354 | 1749 - 1753 | 1749 - 1753 |

Note: Coefficients (and standard errors) from OLS regressions estimated across 10 imputed datasets are presented. The outcome variables have been standardized to have a mean of 0 and a standard deviation of 1. The specific variables in each category are listed in Table 2. The Woodcock-Johnson was not administered prior to age 5.
+p<0.10; *p<0.05; **p<0.01; ***p<0.001.
[a]Differs from "Cohabiting biological-father family" at p<0.05.

Table 4: Contributions of explanatory variables to Adjusted $R^2$

| | PPVT | Woodcock-Johnson | Internalizing Behavior Problems | Externalizing Behavior Problems |
|---|---|---|---|---|
| Family type | 0.007 | 0.002 | 0.029*** | 0.021** |
| Lagged dependent variable | 0.503*** | -- | 0.484*** | 0.559*** |
| Antecedent characteristics (exogenous selection factors) | 0.159*** | 0.281*** | 0.043** | -0.000 |
| Family (in)stability | -0.003 | 0.010 | -0.001 | 0.007+ |
| Concurrent characteristics, economic resources, family relationships, and parenting practices | 0.052*** | 0.321*** | 0.212*** | 0.109*** |
| Concurrent characteristics and economic resources | 0.049*** | 0.243*** | 0.060*** | 0.014* |
| Concurrent family relationships and parenting practices | 0.006 | 0.069*** | 0.106* | 0.083*** |
| Observations per imputed dataset | 1341 - 1343 | 1351 - 1354 | 1749 - 1753 | 1749 - 1753 |

Note: Results are based on regressions presented in Model 4 of Table 3. The marginal contribution to Adjusted $R^2$ is assessed in each of the 10 imputed datasets by estimating the model without the set of variables indicated in the first column, but including all other variables, then calculating the percentage difference in the $R^2$ when the set of variables is and is not included in the model. The figures presented above represent the mean marginal contribution to Adjusted $R^2$ across the 10 imputed dataset. The $R^2$for the full model ranges from 0.352 to 0.375, 0.169 to 0.175, 0.226 to 0.2485, and 0.324 to 0.338 across the 10 datasets for the PPVT, Woodcock-Johnson, internalizing behavior problems, and externalizing behavior problems, respectively. The variables included in each set are listed in Table 2. The Woodcock-Johnson was not administered prior to age 5.
Wald test of joint significance of the set of variables in the full model: +p<0.10; *p<0.05; **p<0.01; ***p<0.001.

Table 5: Blinder-Oaxaca decompositions by father's biological status

| | PPVT | Woodcock-Johnson | Internalizing Behavior Problems | Externalizing Behavior Problems |
|---|---|---|---|---|
| *Mean difference* | | | | |
| Biological father family | 0.09 | 0.06 | -0.04 | -0.08 |
| | (0.03) | (0.03) | (0.03) | (0.03) |
| Social father family | -0.23 | -0.14 | 0.12 | 0.21 |
| | (0.05) | (0.05) | (0.05) | (0.05) |
| Difference | 0.33*** | 0.20*** | -0.16** | -0.29*** |
| | (0.06) | (0.06) | (0.06) | (0.06) |
| *Model 2 decomposition: Family type and lagged dependent variable* | | | | |
| Portion attributable to | 0.31** | -- | -0.12*** | -0.12** |
| compositional differences | (0.04) | | (0.04) | (0.04) |
| Percent | 94.6% | | 74.5% | 39.7% |
| Portion attributable to | 0.02 | -- | -0.04 | -0.18*** |
| differences in associations | (0.06) | | (0.06) | (0.06) |
| Percent | 5.4% | | 25.5% | 60.3% |
| *Model 3decomposition: Add antecedent characteristics (exogenous selection factors)* | | | | |
| Portion attributable to | 0.26** | 0.18*** | -0.08+ | -0.15*** |
| compositional differences | (0.05) | (0.05) | (0.05) | (0.05) |
| Percent | 79.9% | 88.3% | 50.5% | 52.6% |
| Portion attributable to | 0.07 | 0.02 | -0.08 | -0.14* |
| differences in associations | (0.06) | (0.07) | (0.06) | (0.06) |
| Percent | 20.1% | 11.7% | 49.5% | 47.4% |
| *Model 4 decomposition: Add family (in)stability* | | | | |
| Portion attributable to | 0.24** | 0.22*** | -0.01 | -0.17** |
| compositional differences | (0.07) | (0.08) | (0.07) | (0.07) |
| Percent | 84.1% | 106.7% | 4.3% | 57.6% |
| Portion attributable to | 0.05 | -0.01 | -0.15+ | -0.12 |
| differences in associations | (0.08) | (0.09) | (0.08) | (0.08) |
| Percent | 15.9% | -6.7% | 95.7% | 42.4% |
| *Model 5 decomposition: Add concurrent characteristics, economic resources, family relationships, and parenting practices* | | | | |
| Portion attributable to | 0.25** | 0.17+ | 0.15+ | -0.03 |
| compositional differences | (0.09) | (0.10) | (0.08) | (0.07) |
| Percent | 77.7% | 85.9% | -92.0% | 9.4% |
| Portion attributable to | 0.07 | 0.03 | -0.31*** | -0.27*** |
| differences in associations | (0.10) | (0.11) | (0.09) | (0.08) |
| Percent | 22.3% | 14.1% | 192.0% | 90.6% |
| Observations per imputed dataset | 1341 - 1343 | 1351 - 1354 | 1749 - 1753 | 1749 - 1753 |

Note: Results based on models estimated across 10 imputed datasets. Biological-father family coefficients are the reference coefficients. Figures may not sum perfectly due to rounding. The outcome variables have been

standardized to have a mean of 0 and a standard deviation of 1. Model 1 controls only for marital status, Model 2 adds family characteristics at the focal child's birth, Model 3 adds family experiences between focal child's birth and age 5, and Model 4 adds family characteristics and relationships at focal child age 5. The specific variables in each category are listed in Table 2. The Woodcock-Johnson was not administered prior to age 5.
+p<0.10; *p<0.05; **p<0.01; ***p<0.001.

Table 6: Blinder-Oaxaca decompositions by marital status

| | PPVT | Woodcock-Johnson | Internalizing Behavior Problems | Externalizing Behavior Problems |
|---|---|---|---|---|
| *Mean difference* | | | | |
| Biological father family | 0.23 | 0.15 | -0.09 | -0.11 |
| | (0.04) | (0.04) | (0.03) | (0.03) |
| Social father family | -0.27 | -0.18 | 0.13 | 0.15 |
| | (0.04) | (0.04) | (0.04) | (0.04) |
| Difference | 0.50*** | 0.33*** | -0.22*** | -0.26*** |
| | (0.05) | (0.05) | (0.05) | (0.05) |
| *Model 2 decomposition: Family type and lagged dependent variable* | | | | |
| Portion attributable to compositional differences | 0.20*** | -- | -0.20*** | -0.13*** |
| | (0.05) | | (0.04) | (0.04) |
| Percent | 40.8% | | 90.9% | 48.6% |
| Portion attributable to differences in associations | 0.30*** | -- | -0.02 | -0.14* |
| | (0.06) | | (0.06) | (0.05) |
| Percent | 59.2% | | 9.1% | 51.4% |
| *Model 3decomposition: Add antecedent characteristics (exogenous selection factors)* | | | | |
| Portion attributable to compositional differences | 0.35*** | 0.21*** | -0.24*** | -0.16*** |
| | (0.05) | (0.06) | (0.05) | (0.05) |
| Percent | 70.2% | 64.3% | 105.8% | 62.0% |
| Portion attributable to differences in associations | 0.15* | 0.12 | 0.01 | -0.10+ |
| | (0.06) | (0.07) | (0.06) | (0.06) |
| Percent | 29.8% | 35.7% | -5.8% | 38.0% |
| *Model 4 decomposition: Add family (in)stability* | | | | |
| Portion attributable to compositional differences | 0.35*** | 0.22*** | -0.22*** | -0.15*** |
| | (0.05) | (0.06) | (0.05) | (0.05) |
| Percent | 70.2% | 68.8% | 99.8% | 58.7% |
| Portion attributable to differences in associations | 0.15* | 0.10 | -0.00 | -0.11+ |
| | (0.06) | (0.08) | (0.06) | (0.06) |
| Percent | 29.8% | 31.2% | 0.2% | 41.3% |
| *Model 5 decomposition: Add concurrent characteristics, economic resources, family relationships, and parenting practices* | | | | |
| Portion attributable to compositional differences | 0.38*** | 0.29*** | -0.27*** | -0.18*** |
| | (0.06) | (0.06) | (0.05) | (0.05) |
| Percent | 70.0% | 87.7% | 120.7% | 68.7% |
| Portion attributable to differences in associations | 0.12+ | 0.04 | 0.05 | -0.08 |
| | (0.07) | (0.08) | (0.06) | (0.06) |
| Percent | 30.0% | 12.3% | -20.7% | 31.3% |
| Observations per imputed dataset | 1341 - 1343 | 1351 - 1354 | 1749 - 1753 | 1749 - 1753 |

Note: Results based on models estimated across 10 imputed datasets. Married family coefficients are the reference coefficients. Figures may not sum perfectly due to rounding. The outcome variables have been standardized to have

a mean of 0 and a standard deviation of 1. Model 1 controls only for father biological status, Model 2 adds family characteristics at the focal child's birth, Model 3 adds family experiences between focal child's birth and age 5, and Model 4 adds family characteristics and relationships at focal child age 5. The specific variables in each category are listed in Table 2. The Woodcock-Johnson was not administered prior to age 5.
+p<0.10; *p<0.05; **p<0.01; ***p<0.001.