Family Complexity, Siblings, and Children's Aggressive Behavior at School Entry

Paula Fomby, *University of Michigan*
Joshua A. Goode, *University of Colorado Denver*
Stefanie Mollborn, *University of Colorado Boulder*

As family structure in the United States has become increasingly dynamic and complex, children have become more likely to reside with step- or half-siblings through a variety of pathways. These pathways include living with one's biological parents and older half-siblings who were born in one parent's prior union; with an unpartnered parent and at least one half-sibling from that parent's earlier or later union; or with a stepparent and step- or half-siblings in a parent's new cohabiting union or marriage. When these various family structures are accounted for, about one in five children in the United States lives with a step- or half-sibling at age 5 (author estimates from Early Childhood Longitudinal Study-Birth Cohort data).

We propose to assess the independent and joint influence of residing with a single parent or stepparent and with step or half-siblings on children's aggressive behavior at school entry. We focus on children who reside with their biological mother in order to negotiate a manageable set of empirically useful comparison categories. To explain why the presence of step- or half-siblings might be independently associated with young children's aggressive behavior, we draw on a resource-based perspective, considering how the availability of financial, material, temperoral, and emotional resources available to children varies by family structure and sibship composition.

Motivation

Prior research indicates that co-residence with half- or step-siblings is associated with behavior problems and poorer academic performance (Bernstein 1997; Tillman 2008a, 2008b). However, there has been relatively little theoretical development or hypothesis testing to consider *why* step- and half-sibling relationships are associated with children's elevated behavior

problems. The majority of the literature subsumes these relationships into the larger framework of the stepfamily and overlooks sibling configurations to focus on relationship dynamics between parents and their new partners, between children and their stepparents, or between children and their non-resident parents. Less attention has been paid to whether and how the presence of step- and half-siblings in a child's household shapes the distribution of resources and family dynamics.

A related limitation is that most work recognizes step- and half-sibling relationships *only* in the context of the stepfamily – that is, where there is a union between a child's biological parent and a partner who is not related to the child (Ganong and Coleman 2004; Ganong, Coleman and Jamison 2011; Hetherington, Henderson and Reiss 1999). Other complex family arrangements are often overlooked in families that may be classified as "two-parent households" or "single-parent households" where all children are assumed to be biologically related. This classification underrepresents the prevalence of half- and step-sibling relationships in the population. Further, it constrains opportunities for hypothesis testing about the independent effects of stepfather presence and sibling composition and about whether the presence of step- and half-siblings is equally consequential for children across all family structures. We note that while a growing literature has documented the prevalence of complex families emerging from multipartner fertility, there has been little work focused on children's experience in these families.

Finally, very little research has considered the presence of step- and half-siblings in children's families early in the life course, although a significant amount of change in family composition occurs in early childhood. Nationally, as noted above, about one-fifth of children residing with their biological mother also live with a step- or half-sibling at age 5. The prevalence is higher among children born to unpartnered mothers. At birth, about one-quarter of

children born in U.S. urban areas had older siblings born to mothers with a prior partner (Carlson and Furstenberg 2006) , establishing a half-sibling relationship in infancy from the focal child's perspective. In the same population, over half of children born to unpartnered mothers in U.S. urban areas had experienced their mother's eventual repartnering by age 5 (Bzostek, McLanahan and Carlson 2012), introducing the potential addition of step-siblings and half-siblings to a child's family prior to school entry, regardless of whether the mother's new relationship endured.

Theoretical orientation

We work from the perspective that all sibling configurations, regardless of biological relatedness, require families to divide shared resources. For example, household income is apportioned to provide children with food, clothing, and shelter. Parents also invest money and time in facilitating children's activities. More abstractly, parents apply their own stock of mental and physical health to nurture children and promote positive growth. We expect that a shortage of material, temporal, and emotional resources or the unequal distribution of those resources among family members will exacerbate children's aggressive behavior (Ackerman et al. 2001). Further, we anticipate that in complex households, step-sibling and half-sibling coresidence potentially complicates the distribution of resources because of role ambiguity among household members and because of competing obligations to kin outside of the child's household. Hence, we expect that systematic variation in the availability of resources by sibship composition will partially explain why children who coreside with step- or half-siblings experience elevated levels of mother-reported aggressive behavior at school entry. In particular, we anticipate that the presence of step/half-siblings will predict higher levels of aggressive behavior than will the presence of full siblings, and resource availability will at least partially mediate this relationship.

Data and Methods

We use data from the restricted-use Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), a nationally-representative longitudinal study of approximately 10,600 children born between 2000 and 2001. All 2001 births registered in the National Center for Health Statistics vital statistics system were eligible, and the sample was drawn using a clustered, list frame design. Children and their families were followed over four waves until the spring of children's kindergarten year (either in 2006 or 2007, depending on the child's month of birth). The child's primary parent (usually the mother) was initially interviewed in person when the child was about nine months old, and again at age 2, age 4, and in the fall of the child's kindergarten school year. Because of budgetary constraints, the kindergarten wave selected a random subsample of about 85% of the children whose parent had completed the preschool interview, though all American Indian/Alaska Native children who completed either the 2-year or the preschool wave were included (Snow et al. 2009). The weighted response rates for the parent interview were 74, 93, 91, 92 (2006 kindergarten wave), and 93 (2007 kindergarten wave) respectively. We restrict the sample who lived at least 50% of their time with their biological mother at age 4 and in the kindergarten wave. Our analytic sample includes approximately 6800 children. (Licensing restrictions require rounding analytic sample size to the nearest 50.)

Our measures of parents' union status and siblings' biological relatedness are drawn from the household roster collected during the third wave of the study, when children were approximately 4 years old. With regard to union status, we consider whether children reside with their unpartnered mother, their mother and biological father, or their mother and a married or cohabiting stepfather/social father. With regard to sibship, we consider whether children live with no siblings or full siblings only (i.e., siblings to whom they are biologically related through their mother and father), with any half siblings (i.e., siblings with whom they share one

biological parent, assumed to be the mother although this is not specified in the household roster), or with any step-siblings (i.e., children in the household who are identified as step-siblings by the respondent and who are assumed to have no biological relationship to the focal child. Step-siblings are assumed to be the biological children of the stepfather/social father in the household). In the analyses presented here, we combine step- and half-siblings into a single category to maximize cell sizes. We will conduct sensitivity tests to determine whether we can distinguish different influences of step-sibship and half-sibship.

From these measures, we construct a six-category indicator of family structure at age 4:

- Living with biological father and no step/half siblings (61.7% of children)
- Living with no father and no step/half siblings (14.9%)
- Living with stepfather and no step/half siblings (3.4%)
- Living with biological father and any step/half siblings from a parent's prior union (10.2%)
- Living with no father and any step/half siblings (6.2%)
- Living with stepfather and any step/half siblings (3.5%)

Our dependent variable is a summed score of 7 items pertaining to the primary parent's report of children's aggressive behavior at school entry. The scale includes items concerning children's physically aggressive behavior, anger, impulsivity, and destruction of property. Parents were asked whether children engaged in these behaviors never, rarely, sometimes, often, or very often. Possible scores range in value from 7 (never engage in any aggressive behavior) to 35 (child engages in all behaviors very often).

We use measures from the age 4 interview as independent variables to assess our hypotheses pertaining to the role of household resources and parental stress in explaining the association between sibship and children's aggressive behavior. Our measure of household resources includes the following:

- Three economic indicators: *household income* (available as an ordinal measure, as household income relative to the poverty threshold, and as a measure of relative income);

> *household assets*, including home and vehicle ownership, investments, and a bank account; and *child food sufficiency*

- Three indicators of resources at home: the *number of books* in the home and the average *number of hours children watch television* on weekdays; and whether the household has a *computer* children use
- Eight indicators of time investments in children: frequency of *family meals*; frequency of *reading, singing, telling stories*, or *playing* together with children; and frequency of outings to the *library, park, or cultural centers.*
- Seven indicators of enrichment investments in children: Whether child has participated in *team sports, dance* or *music* lessons, or other educational or developmentally *enriching programs*
- Two indicators of parent health: *Maternal depression* when child was 4 years old (based on responses to the CES-D assessment) and maternal self-reported *physical health*.

Preliminary results

Table 1 describes the distribution of children's living arrangements by mother's union status and the presence of step- or half-siblings in the child's household at age 5. Of the 20 percent of children living with siblings to whom they are not fully biologically related, just over half live with their own biological parents and older half-siblings born in a prior union; nearly one-third reside with a single mother and at least one half-sibling from an earlier or later union; and about 17 percent reside with a stepfather and step- or half-siblings. Hence, in early childhood, a relatively small share of children with step- or half-siblings resides with a cohabiting or married stepfather.

Compared to children in two-parent households with no siblings or full siblings only, those in any other family configuration have higher aggressive behavior scores at school entry (p<.01). More strikingly, there is also significant variation in children's aggressive behavior among those alternative family structures. Children who reside with step- or half-siblings have higher aggressive behavior scores on average compared to children whose parents have the same union status but who have no step-or half siblings. Among children who have step- or half-siblings, those residing with a single parent or a stepparent have more reported aggressive

behaviors on average compared to children who reside with both biological parents. (Children residing with step- or half-siblings and either a single mother or a stepfather have statistically equivalent aggressive behavior scores.) These descriptive results suggest that mother's union status and the presence of step-siblings have independent associations with aggressive behavior at school entry.

Table 2 presents coefficients and robust standard errors from preliminary Poisson regression models estimating children's aggressive behavior scores as a function of mother's union status and presence of step- or half-siblings in the household at age 4. Model 1 accounts only for the number of full siblings and the number of step/half-siblings a child resides with. Model 2 accounts for mother's union status only. Model 3 includes both the number of siblings of each type and mother's union status. Model 4 uses our six-category measure that combines mother's union status and child's sibship. All models child race/ethnicity, child gender, child age at the kindergarten interview, child temperament at 9 months, maternal education, and mother's age at the child's birth.

Consistent with the descriptive results, we see in Model 1 that the presence of step- or half-siblings (but not full siblings) in a child's household at age 4 is associated with elevated aggressive behavior scores at age 5. Each additional step/half sibling increases a child's predicted score by approximately 12.5 percent (exp(.118)=1.125). Model 2 shows that residence in a single mother or stepfather household compared to two biological parents is also associated with higher aggressive behavior scores. Model 3 suggests that the influences of sibship and union status are largely independent of each other – the magnitude of the associated coefficients and their statistical significance remain largely unchanged compared to models 1 and 2. Model 4 implies that the effects of mother's union status and children's sibship are likely to be additive –

the magnitude of the coefficients associated with each family structure category is roughly similar to the sum of the analogous coefficients in model 3. (We will evaluate this interpretation empirically with interaction effects between parents' union status and number of full and step/half-siblings.)

We will further develop our models to assess the attenuating effect of material, temporal, and emotional resources available to children in households with and without step- or half-sibling members. We will also explore whether children's behavior varies by whether siblings are biologically related (i.e., half siblings) or not (i.e., stepsiblings) in each union status context. Finally, to the extent possible given data and modeling limitations, we will assess the influence of father involvement (biological fathers and step/social fathers) as an additional resource available to children. In addition, we will assess whether results using teacher reports of children's aggressive behavior reported in the kindergarten year are consistent with our findings pertaining to mother reports.

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Table 1. Distribution of family structure by presence of biological or social father and step/half-siblings at preschool wave (age 4) Source: ECLS-B

	Proportion of all children	Proportion of children with any step/half siblings	Mean aggressive behavior score	SD aggressive behavior score	
Biological father, no step/half siblings	0.617		8.389	4.006	
Nonbiological father, no step/half siblings	0.034		9.661	4.511	a
No father present, no step/half siblings	0.149		9.514	5.007	a
Biological father, any step/half siblings	0.102	0.514	9.326	4.580	a
Nonbiological father, any step/half siblings	0.035	0.173	10.716	5.301	a, b, c
No father present, any step/half siblings	0.062	0.312	10.283	5.019	a, b, d

N~6800

[a] different from biological father, no step/half siblings (p<.01)

[b] different from biological father, any step/half siblings (p<.01)

[c] different from nonbiological father, no step/half siblings (p<.05)

[d] different from no father present, no step/half siblings (p<.01)

Table 2. Poisson regression coefficients estimating aggressive behavior scores at school entry as a function of family structure and family complexity
Source: ECLS-B

	B	SE		B	SE		B	SE		B	SE	
Race/ethnicity (vs. non-Hispanic white)												
Non-Hispanic Black	-0.033	0.028		-0.046	0.026	†	-0.052	0.025	†	-0.052	0.025	*
Hispanic	-0.033	0.027		-0.028	0.027		-0.026	0.027		-0.026	0.026	
Other race/ethnicity	-0.038	0.028		-0.042	0.028		-0.041	0.027		-0.041	0.027	
Male	0.183	0.017	***	0.183	0.017	***	0.185	0.017	***	0.185	0.017	***
Child age in months at school entry	-0.006	0.002	**	-0.006	0.002	**	-0.006	0.002	**	-0.006	0.002	**
Mother's union status at birth (vs. married)												
Cohabiting	0.023	0.029		0.003	0.030		-0.006	0.031		-0.006	0.031	
Single at birth	0.036	0.032		-0.027	0.036		-0.026	0.037		-0.027	0.037	
Child temperament at 9 months	0.026	0.004	***	0.027	0.004	***	0.026	0.004	***	0.026	0.004	***
Mother's age at birth	-0.005	0.002	**	-0.002	0.002		-0.003	0.002	*	-0.003	0.002	*
Mother's education at birth (ordinal)	-0.016	0.006	*	-0.018	0.006	**	-0.014	0.006	*	-0.014	0.006	*
Family structure at wave 3												
# of biological sibs	0.031	0.019					0.050	0.019	**	0.050	0.019	**
# of step/half sibs	0.118	0.026	***				0.106	0.027	***			
vs. biological father present												
No father present				0.120	0.030	***	0.123	0.029	***			
Step/social father present				0.155	0.031	***	0.134	0.033	***			
vs. biological father, no step/half siblings												
Step/social father, no step/half siblings										0.125	0.041	**
No father present, no step/half siblings										0.128	0.032	***
Biological father, any step/half siblings										0.110	0.033	**
Step/social father, any step/half siblings										0.251	0.051	***
No father present, any step/half siblings										0.219	0.044	***
Intercept	2.543	0.154	***	2.523	0.149	***	2.483	0.153	***	2.480	0.154	***
lnalpha	-2.094	0.062		-2.098	0.061		-2.114	0.062		-2.114	0.062	

N~6800