BLENDED FAMILIES AND THEIR INFLUENCE ON SIBLING RELATIONSHIPS AND FIRST UNION FORMATION

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ABSTRACT

Kara Joyner and Gary Oates, Advisors

Over the last fifty years, the proportion of children living with a single parent or a stepparent has increased dramatically due to high rates of divorce, non-marital childbearing, and cohabitation. Research continues to suggest that children from two biological parent families fare better than children from other types of families with respect to a variety of outcomes. A small but growing literature on blended families suggests that conventional measures of family structure fail to capture adequately the complexity of living arrangements for children who reside with two biological parents and one or more half-siblings. This nascent literature suggests that these children do not reap the full benefits of living with two biological parents. In fact, they more closely resemble children who reside with a stepparent. Studies examining blended families have focused on cognitive, educational, and psychological outcomes during childhood and adolescence but they have not examined sibling relationship quality or union formation. Nor have they been able to explain fully the relative disadvantages of children in blended families. Finally, studies have yet to address the implications of family boundary ambiguity for the measurement of blended families. This study uses the incomplete institutionalization perspective to address four questions: (1) How discrepant are the family structure reports of siblings who reside in blended families versus other arrangements?; (2) Does sibling relationship quality in blended families differ from that in other families?; (3) Is growing up in a blended family associated with union formation patterns in young adulthood (e.g., the transition to a first co-residential union)?; (4) Does sibling relationship quality mediate the association between family structure and first union formation? Using data from waves one and four of the National Longitudinal Study of

Adolescent Health (Add Health), I find that six percent of all sibling pair reports of family structure are discrepant and that discrepant reports are more likely to occur in complex families, particularly blended cohabiting families. Siblings in blended families do not significantly differ from siblings in other family types in their reports of affection. Individuals from blended families form first co-residential unions at younger ages than their counterparts from two biological parent families. Sibling relationship quality is not associated with the rate of first union formation; however, poor sibling quality increases the likelihood of cohabitation and good sibling relationship quality increases the likelihood of marriage.

This dissertation is dedicated to my father for knowing me better than myself, my grandmother for teaching me compassion and understanding the human condition, my mother for her support and singular focus, and to Roxanne for being who she is.

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CHAPTER I: INTRODUCTION

Studies have long examined the link between childhood living arrangements and child well-being. Much of this literature has shown, using a variety of indicators, that children from two biological parent families (i.e. families in which children reside with their married biological parents), on average, fare better when compared with children from other family living arrangements (Brown; 2010; Amato, 2005; Amato & Keith, 1991b). Despite the plethora of work, considerable heterogeneity remains in both the measurement of family structure and its relationship with child well-being, reflecting the increasing complexity of American family life.

Recent research concerning the effects of family structure has distinguished blended families from other family structures. A blended family consists of two parents, their biological children and half-siblings who are biologically related to only one parent (Halpern-Meekin & Tach, 2008; Ginther & Pollak, 2004; Strow & Strow, 2008; Gennetian, 2005). The emerging literature on blended families suggests the following: (1) blended families have been misclassified as either two biological parent or stepfamilies in prior research (Gennetian, 2005); (2) in blended families, half-siblings who are biologically related to both parents are just as disadvantaged as their half-siblings who are biologically related to one parent; and (3) the mechanisms explaining the relative disadvantage of shared children in blended families are elusive.

Studies on blended families have made important contributions to the discussion about the value of two biological parents to the well-being of children but the literature is limited. The research so far indicates that there is much more to the story than two biological parents (Ginther & Pollak, 2004). Two biological parents are not enough to ensure that shared children in blended families experience the same levels of well-being as children from two biological parent

families. However, the evidence for this conclusion is limited in three ways. First, child well-being is limited to academic achievement, delinquency, and depression in childhood and early adolescence. Studying adult child outcomes like union formation may offer much needed refinements in the literature. Second, we know that the blended family is misclassified but no one has examined how family ambiguity contributes to this misclassification. Third, researchers cannot account for the disadvantage, yet a key factor differentiating shared children in blended families is that they have half-siblings, the existence of whom appears to negate the advantage of having two biological parents (Strow & Strow, 2008; Halpern-Meekin & Tach, 2008; Tillman, 2008; Brown, Manning & Stykes, 2015). Sibling relationships may prove to be one of the elusive ways that blended families shape child well-being.

Exploring the Connection among Measuring Blended Families, Sibling Relationships, and Union Formation

The U.S. Census Bureau estimates that approximately 15.8% of children under age 18 live in blended families (Kreider & Ellis, 2011). This estimate includes children who live in single parent families, two parent families, and families with no half-siblings. In this study, I restrict blended families to those that have two parents and two children who are half siblings (Halpern-Meekin &Tach, 2008). More than half of these blended families were stepfamilies that became blended families with the birth of a shared child. Half-siblings in two-parent blended families probably experience their family from very different perspectives. Some siblings are biologically related to both parents but others are related to only one. Measurement is significantly more complicated because the family is a paradox; it is simultaneously a step- and two biological parent family.

Because of the complexity of blended families, researchers have misclassified and miscounted them (Gennetian, 2005). At the root of the misclassification is the incomplete institutionalization (the lack of clearly articulated normative rules governing family member roles) of the blended family and family boundary ambiguity (the discrepancy in reporting who is a family member) that affects the measurement of complex families (Brown & Manning, 2009; Cherlin, 1978). Brown and Manning (2009) find that 11% of mother-child reports of family structure in the National Longitudinal Study of Adolescent Health (Add Health) are discrepant, indicating family boundary ambiguity.

Blended families have two additional measurement problems. The first problem is the way in which family structure is commonly measured. Most family structure research has assessed childhood living arrangements by focusing on the relationship of the child to the adults, while ignoring relationships to other children in the household. The second problem results from the first. If sibling genetic relationships are ignored, the classification of family structure will vary according to which of the half-siblings is the unit of analysis. If the focal child is the shared child, then the family is incorrectly identified as a two biological parent family. If the focal child is the other half-sibling, then the blended family is instead identified as a stepfamily. Studies that accurately measure blended families do so by measuring relationships between the focal child and other children in the household. Unfortunately, most of these studies use data that have inadequate numbers of half siblings, which limit the scope and power of their analyses (Hofferth & Anderson, 2003; Hofferth, 2006). Other blended family research ignore the union status of two-parent families, which is an important correlate of child well-being (Manning & Brown, 2006). None has assessed the pervasiveness of family boundary ambiguity in the measurement of blended families, nor is there any work on family boundary ambiguity using sibling reports of

family structure from siblings who reside in the same household. A notable exception is White (1998) who looked at boundary ambiguity in adult siblings who did not reside in the same household.

Sibling relationships are central to family life and individual development, yet we know relatively little about these relationships when compared to other family relationships (Kramer & Bank, 2005). Throughout the life course, but especially during childhood, siblings provide companionship and support, resources that are important to their well-being (McHale et al., 2007; Kowal & Kramer, 2004). For example, East and Khoo (2005), using longitudinal data, show that sibling warmth reduced drug use and sexual risk behaviors of girls from single-parent families. Additionally, sibling relationships are contexts for developing relationship skills that are necessary for forming successful peer and best friend relationships (McCoy, Brody & Stoneman, 1994). These findings imply that sibling relationships are one of the ways that family structure is associated with child well-being. These relationships are possibly even more important in blended families than in other family types. Hetherington (1999) has suggested that the stepparent-stepchild relationship may be more salient than the marital relationship in shaping family dynamics within the stepfamily. For blended families, half-sibling relationships may serve a similar role in family dynamics.

A dominant pattern found in family research is the intergenerational transmission of status to children. Families transmit socioeconomic characteristics from one generation to the next (McLanahan & Percheski, 2008). For instance, children from high socioeconomic status (SES) families are likely to achieve the same SES as their parents in adulthood (Carvalho, 2012). Families also transmit union formation behavior in similar ways. Literature on union formation (the process of entering cohabiting and marital relationships) suggests that children inherit their

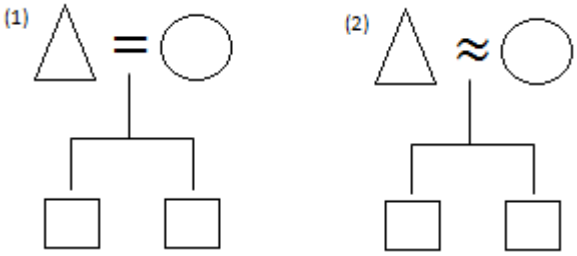
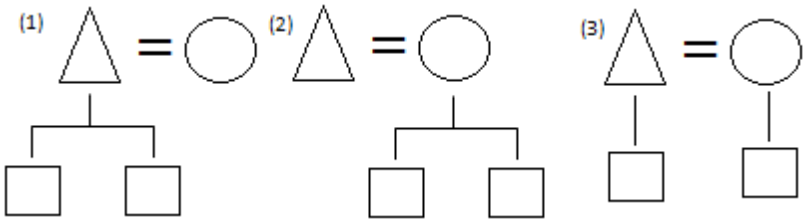
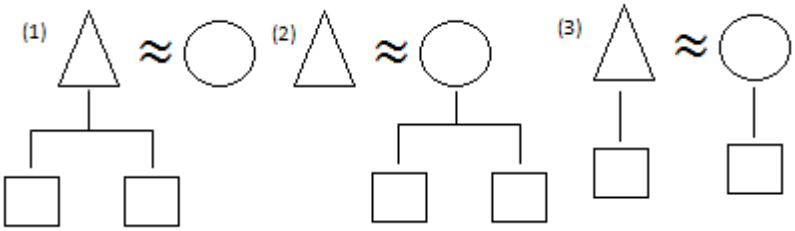
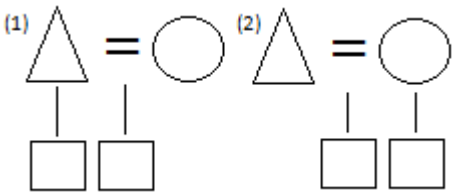
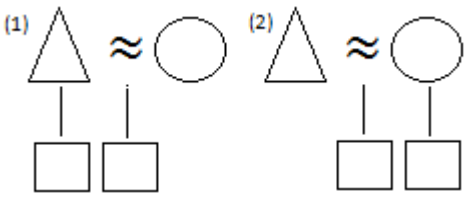
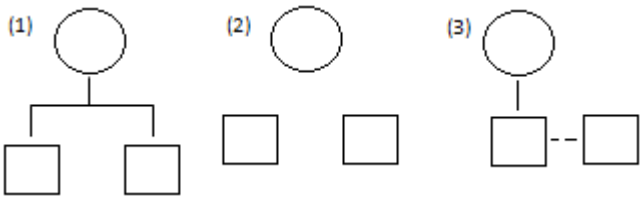
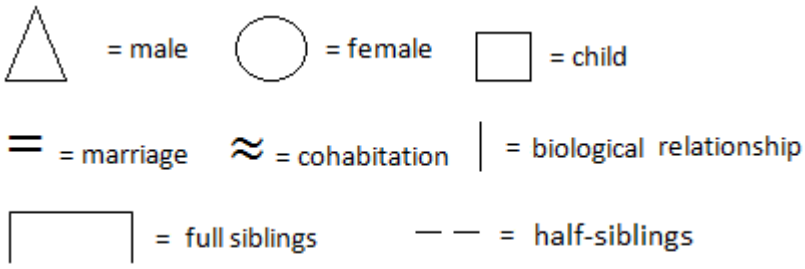
parents' union formation behaviors (Vespa, 2012; Teachman, 2003a; Amato & Booth, 2001). Specifically, compared to their counterparts from non-two biological parent families, children from two biological parent families are more likely to delay forming their first co-residential union, and when they do form unions, they are more likely to marry and less likely to cohabit. For shared children from blended families this process is probably more ambiguous, as research indicates that they will be more like children from non-two biological parent families than children from two biological parent families in their levels of academic achievement, delinquency and depression (Ginther & Pollak, 2004; Strow & Strow, 2008; Halpern-Meekin & Tach, 2008). However, associations between family structure and child well-being may vary by outcome being studied (Teachman, 2003) and prior studies have not examined union formation. The attention here to how blended families differ in terms of union formation thus adds an intriguing dimension to research on the link between family structure and children's outcomes.

Data from Add Health and the genetic oversample offer an unprecedented opportunity to expand the work on blended families and further the research on childhood living arrangements and union formation. To continue exploring the heterogeneity in two-parent families, I develop refined measures of family structure that provide nationally representative estimates of blended families and reduce misclassification by using multiple-source reports (Brown & Manning, 2009). I expand the discussion of the importance of two biological parents to adolescent well-being in two ways. First, I extend blended family research by examining, as outcomes, sibling relationship quality and the formation of first co-residential unions. Second, I explore whether the quality of sibling relationships is associated with both family structure and first co-residential union formation.

Research Goals

The first objective of this study is develop two measures of family structure that improve the measurement of blended families. One measure uses sibling pair reports of family structure to assess the extent of, and reduce, family boundary ambiguity. The other measure of family structure, developed using the reports of the focal adolescent, provides nationally representative estimates of cohabiting and married blended families with two children. This measure makes it possible to develop a demographic and social profile of blended families relative to two biological parent and other non-two biological parent families. I use data from wave 1 and the genetic oversample of Add Health to create the measures. Both measures, like those used in other blended family studies, incorporate genetic relationships between children in the household (Ginther & Pollak, 2004; Gennetian, 2005; Halpern-Meekin & Tach, 2008). The strategy for identifying blended families factors in the presence of half-siblings in two-parent households and the marital status of resident parents (see Figure 1). Both family structure measures have the following six categories: two biological parent (full siblings) families, married stepfamilies (step- and full siblings), cohabiting stepfamilies (step- and full siblings), cohabiting blended families (half-siblings), married blended families (half-siblings), and single-parent families (full, step-, and half-siblings). The first measure differs from the second in the use of reports from the sibling pair in the household to confirm each other's reports of family structure. Discrepant reports indicate family boundary ambiguity. I use the second family structure measure to obtain weighted estimates of cohabiting and married blended families and develop a socio-demographic profile of each family type. Specifically, the socio-demographic characteristics will include, for example, the socioeconomic status of parents, sibling relationship quality, and the average age of

Figure 1: Kinship Diagram of the Family Types in the Family Structure Measure

Family Type	**Kinship Diagram**
Two-biological parent (full siblings) families	
Married stepfamilies (step- and full siblings)	
Cohabiting stepfamilies (step- and full siblings)	
Married blended families (half-siblings)	
Cohabiting blended families (half-siblings)	
Single-parent families (full, step-, and half-siblings)	
Key	

first union formation differ for children from each of the six types of family structures during adolescence. Ideally, it is better to have one family structure measure to assess family boundary ambiguity and produce weighted estimates but unfortunately, the genetic oversample that is the source of the sibling pair reports does not have sample weights.

The second objective is to determine how the quality of sibling relationships in blended families differs from that in other family structures (two biological parent families, married stepfamilies, cohabiting stepfamilies and single-mother families). Most of our empirical knowledge about family structure and sibling relationships comes from three research projects: Hetherington's longitudinal research, the Avon Longitudinal Study of Pregnancy and Children, and the Non-shared Environment and Adolescent Development project (Baham et al., 2008). Family structure in these studies is limited to two biological parent, remarried and single parent families (Hetherington & Clingempeel, 1992; Mekos, Hetherington & Reiss, 1996; Deater-Deckard, Dunn, & Lussier, 2002). Data from wave 1 and the genetic oversample also enables me to examine how family structure is associated with the reported level of sibling positivity and negativity.

The third objective is to investigate how growing up in a blended family is associated with first co-residential union formation behavior in young adulthood. I use data primarily from waves 1 and 4 to investigate whether the timing and the type of first union formed (cohabitation versus marriage) vary with family structure. Blended family research has addressed a restricted range of outcomes. Most of these outcomes are concentrated into three areas: cognitive development, educational achievement, and behavioral problems (Halpern-Meekin & Tach 2008; Strow & Strow, 2008; Hofferth, 2006; Evenhouse & Reilly, 2004; Ginther & Pollak, 2004;

Gennetian, 2005). In addition, only two of these studies have looked at child well-being during adolescence or adulthood.

The fourth objective of this dissertation is to determine if sibling relationship quality is important in the intergenerational transmission of union formation behavior. Specifically, I examine whether the quality of sibling relationships mediates the link between family structure and union formation. As mentioned earlier, researchers have tried to discover why blended families are not as good for children as two biological parent families but have not been successful thus far. The literature suggests that stepchildren are disadvantaged relative to children from two-parent biological families because stepparents invest fewer resources (money and time) in their development than do biological parents (Biblraz & Raferty, 1999). Some studies indicate that parental investments may be regulated by genetic relationships. I argue here that the quality of the half-sibling relationships, though not clearly culturally defined, motivates parents to invest equally in both half-siblings and in some way this shapes child well-being outcomes such as union formation.

Contributions of this Research to Empirical Knowledge

This dissertation contributes to the literature in four ways. First, it provides exhaustive measures of family structure that reduces misclassification by using of multiple-source reports and produce estimates of blended families using a nationally representative school-based sample of adolescents. Additionally, the revision and estimates ensure that the literature remains relevant to the actual experiences of families (Bumpass, Raley, & Sweet, 1995). Second, the study adds to the limited literature on blended families by clarifying the role that family structure plays in child well-being. It does so by expanding the child outcomes examined in the blended family literature to include adult-child union formation patterns and sibling relationships. Third, this dissertation

adds to the growing literature on sibling relationships by examining the association between family structure and sibling relationships. Fourth, the study explores how sibling relationship quality mediates the relationship between blended family structure and union formation. Attention to this link may uncover a mechanism that accounts for the disadvantage of shared children in blended families. This question has not received sufficient attention in prior work on blended families.

In the chapters that follow, I outline the theory, empirical research, methodology, and findings, and discuss implications of this study. Specifically, in chapter 2 I discuss incomplete institutionalization and family boundary ambiguity and the implications for sibling relationships and union formation. In chapter 3, I review the literature on family structure measurement and blended family research over the last several decades. In chapter 4, I review the literature on family structure and union formation, highlighting what little research there is on the relationship between sibling relationship quality and union formation. I discuss the methodology used in this study in Chapter 5. Chapter 6 details the results of the assessments of data quality and the level of family structure ambiguity in the measurement of family structure. In chapter 7, I present the descriptive profile for blended families and the results of ordered logit regression models for family structure on sibling relationship quality. I describe the results from the Cox models in which I regressed family structure on first union formation in chapter 8. In Chapter 9, I interpret, discuss, and form conclusions about the theoretical significance of the study.

CHAPTER II: INCOMPLETE INSTITUTIONALIZATION AND FAMILY BOUNDARY AMBIGUITY

Cherlin (1978) proposed the incomplete institutionalization perspective to explain the difficulties experienced by married stepfamilies. Family structure researchers do not commonly use the perspective as a theoretical framework but it is particularly instructive in understanding emerging family structures. With its emphasis on the difficulties associated with negotiating kinship roles and responsibilities, the perspective is an effective platform for understanding family boundary ambiguity, the challenges of measuring complex families, and explaining why child outcomes are different in complex families from other family structures.

In this chapter, I review the incomplete institutionalization perspective, family boundary ambiguity and some of the posited mechanisms in family structure research: economic deprivation, parenting resources/socialization, and biological relatedness. These three mechanisms argue that differences between two biological parent and non-two biological families are a function of parental investment. Parents who do not make adequate investments of money and time in their children may compromise their well-being. The extent to which parents make both types of investments may be associated with the genetic relationship among parents and children. I begin with a description of the incomplete institutionalization perspective and family boundary ambiguity and then discuss how both may be linked to family structure and sibling relationships. I end the chapter with a discussion of the ways in which the incomplete institutionalization perspective and family boundary ambiguity may be relevant to the other mechanisms that link family structure to sibling relationships and union formation.

Andrew Cherlin (1978) argued that remarriage was an incomplete institution, a view he recently reiterated (Cherlin, 2004). It is incomplete because the authority and specific

responsibilities of stepparents have remained poorly articulated (Sweeney, 2010). The lack of clear institutional guidelines regulating the roles and relationships among individuals in stepfamilies predispose them to internal conflicts and stress, the result being disunity. The ambiguity of the role of the non-resident parent and the turbulence associated with union disruption and formation further complicate the matter, particularly for the children involved (Brown & Manning, 2009). To understand the premise of this hypothesis, it is necessary to discuss first the relationship between family structure and family boundary ambiguity.

Family Structure and Family Boundary Ambiguity

Family structure shapes relationships within families by affecting individual exposure to status, roles and accompanying expectations. Family members utilize their knowledge of status and roles to negotiate and navigate their relationships with other family members both in and outside of the household. An individual's personal characteristics and broader social context (e.g. socioeconomic or legal context) may facilitate or hinder their ability to perform familial roles.

Variations in family structure affect the properties of the family unit through differences in the level of boundary ambiguity that is inherent in all family structures. Boundaries allow family members to differentiate themselves from the external environment as a distinct entity with its own set of characteristics, as well as, delineate specific relationships from others within the family unit (Stewart, 2007; Pasley, 1987). Family boundary ambiguity is the degree to which family members are unable to determine family membership i.e., differentiating their family from other families and community (Brown & Manning, 2009). Boundary ambiguity is positively related to boundary permeability but negatively related to boundary clarity. Permeability is the level of access to the family for individuals external to the unit: the greater the ease of exchange, the greater the boundary permeability. Boundary clarity is the level of

consistency of contact (physical and psychological) among individuals within the family unit. More consistency results in a better understanding of the status of the individual within the family. Consequently, a family structure functions best when it facilitates boundary differentiation of subsystems within families and as a unit from the external environment (Stewart, 2007; Pasley, 1987).

Family Boundary Ambiguity and Sibling Relationships

In theory, the two biological parent family has no boundary ambiguity. Relationships among family members are firmly entrenched and regulated by biosocial, legal and other cultural norms concerning the arrangement of households. Family members are therefore sure about (and accept) the status of both immediate and extended family members and by extension their rights and responsibilities within the family unit. This makes the family boundaries of two biological parent families relatively impermeable and consistent. Family members in two biological parent families have a clear idea of who is in and out of their family and their responsibilities to these individuals. Sibling relationships may be more structured in two biological parent families than in non-two biological parent families. Siblings have well-defined cultural norms about how they should behave with their siblings. Brothers and sisters should engage with, love, teach, and protect each other (White & Riedmann, 1992; Deater-Deckard, Dunn, & Lussier, 2002). Parents expect sibling rivalry and other forms of disagreement, but these should not compromise the sibling bond. Families that have half- siblings, stepsiblings and stepparents may not have these same culturally defined expectations.

Stepfamilies created through divorce or non-marital childbearing may lack institutional support (Cherlin, 1978, 1999). Without institutional support, presumably, the addition of a stepparent creates boundary ambiguity. Boundaries within this family type are largely self-

determined and articulated through trial and error over time. For example, stepparents may be uncertain about their level of involvement in parenting and resource distribution (Sweeney, 2010). Parents may prefer, at least in the short term, to retain responsibility for parenting their children and therefore exclude stepparents from decisions involving child-rearing (Sweeney, 2010; Pasley, 1987). This creates ambiguity within the marital and stepparent-stepchild dyad, which could affect the level of stepparent investment (in terms of time and money allocated to the stepchild). Additionally, if the parent and child had been a single parent family, the introduction of a new partner may create difficulties because some of the support provided by the child is expected to come from the new partner. This change requires a restriction of the role and responsibilities that the child played in the single parent family. This in turn may result in greater difficulties in delineating the stepparent-stepchild relationship boundaries and the resulting antagonism may cause the stepparent's withdrawal.

Boundary ambiguity may also be greater in stepfamilies because boundaries are more permeable and inconsistent. New kin relationships often emerge, such as visiting stepsiblings and other step-relatives. These persons may interact with the family unit infrequently with less cultural, legal or biological precedent regulating these relationships, and are unlikely to be considered family members (White, 1998). Another source of ambiguity for the stepchild is how to relate to visiting stepsiblings and/or residential stepsiblings. S/he has to determine whether these 'visitors' should be treated like family. More importantly, if they reside in the home, are they siblings or friends? If they are teenagers, they may also have to reconcile feelings of sexual attraction (Hetherington, 1999).

Overall, the foregoing discussion poignantly suggests that family structures with more complex relationships to navigate may have greater boundary ambiguity. Brown and Manning

(2009) find that family boundary ambiguity was more acute in cohabiting stepfamilies than in all other family types. Without legally enforceable obligations and responsibilities to children or to unmarried partners, family roles and expectations are more variable and dependent on the relationship quality of the dyad and personal choice than in married stepfamilies. Stepfamilies and other non-traditional families may have stepparent-stepchild, half-sibling, and stepsibling relationships that are complex and characterized by permeability, poor clarity, and boundary ambiguity.

In addition to these internal factors, the broader social context, such as the extent to which the community and/or society supports alternative family structures, may also affect permeability and clarity. The lack of guidelines for stepparent-stepchildren relationships, as well as sexual relationships within this dyad and between stepsiblings all contribute to boundary ambiguity. Another disadvantage for the stepfamily is its persistent negative representation in the mass media. While its image has improved somewhat, stigmatization remains: public perception of children and parents in stepfamilies is more negative than that in two biological parent families (Stewart, 2007).

In sum, families without clear normative guidelines and institutional support may have more family boundary ambiguity. One of the ways this could occur is through the lack of consensus about family membership. Without institutionalization, individuals may have differing idiosyncratic ideas about who can be a parent or sibling. The inability of family members to definitively agree on who is in their family may also weaken family relationships. Strained relationships between partners are more likely because of different expectations for parenting biological and non-biological children. Parent-child relationships may be upset by the introduction of a stepparent/cohabiting partner, stepsiblings and later by half-siblings. Similarly,

siblings have to negotiate their relationships with their new parent, stepsiblings, and half-siblings. Without rules to guide this process, it is possible that these relationships and sibling relationships in particular, are more antagonistic than those in two biological parent families are. Brown and Manning (2009) lend support to the viability of this mechanism. Their findings indicate that complex families have more family boundary ambiguity and lower family closeness and connectivity than two biological parent families.

Incomplete Institutionalization, Family Boundary Ambiguity, Sibling Relationships and Union Formation

Family researchers typically use five sets of mechanisms to account for the differences in child well-being among family structures: economic resources, parenting resources or socialization, biology, stress and selection (Biblraz & Raftery, 1999; Amato & Keith, 1991a, 1991b). Few researchers have linked incomplete institutionalization and family boundary ambiguity to these mechanisms (a notable exception is Brown and Manning, 2009). This dissertation takes the view that these mechanisms can operate within the broader incomplete institutionalization framework. The following discussion focuses on the three of the five mechanisms.

The economic, parenting, and biological mechanisms all assume that family members satisfy their institutionalized roles and responsibilities to each other. For instance, all three mechanisms assume that child well-being is a function of parental investments. Socio-cultural norms regulate parental investments (Sweeney, 2010; Thomson, Hanson & McLanahan, 1994). In other words, the level of institutionalization of families determine parental investments in children and the level of stress they experience in playing these roles. For example, in comparison to married couples, cohabiters are less likely to contribute equally to running the

household and provide less monetary support to the children of their partners (Deleire & Kalil, 2005). Additionally, stepfathers invest less time and money in their stepchildren than biological fathers do on their children (Hofferth, 2006; Hofferth & Anderson, 2003; Astone & McLanahan, 1991). Stepparent-stepchild relationships have lower levels of communication and higher levels of conflict and stress (Amato & Sobolewski, 2001; Hetherington & Jodl, 1994). Children from families with negative family relationships experience more alienation from their families, greater dependence on peer groups, early home leaving, and early union formation (Hetherington & Jodl, 1994).

Although selection is not a focus of this study, it is an important mechanism in stepfamily research, and so a brief discussion is warranted (Cherlin et al., 1998). The selection hypothesis postulates that the observed differences in child well-being is not a function of family structure. Differences are instead a function of parents' characteristics, which are related to both family structure and child well-being. Some parents have genetic and social traits that make it difficult for them to be both good parents and good partners (Coleman et al., 2000). These characteristics may predispose them to form non-two biological parent families and parent ineffectively (Brown, 2010; Biblraz & Raftery, 1999). Studies on family structure and child well-being typically control for selection by including variables reflecting personality traits, depression, and antisocial behaviors of parents. These studies find that differences between stepchildren and children in two biological parent families become smaller with the inclusion of control variables. This suggests that in the absence of an exhaustive set of control variables for selection, the results reported in this dissertation are possibly overstating the effects of family structure. While it is advised to interpret the results with caution, it is important to note that the relationship

between family structure and child well-being typically persists after controlling for selection (Brown, 2010).

CHAPTER III: FAMILY STRUCTURE MEASURES

In this chapter, I begin with a review of the development of family structure measures used in the literature over the last several decades. Starting with the comparison of two biological parent and non-two biological parent families, the discussion maps the development of family structure measures from a simple dichotomy, through revisions made necessary by cohabitation, and finally to the modifications needed to capture the complexity of the blended family. I then discuss the research on blended families, focusing in detail on the approach and findings of the small number of studies on this topic.

Significant Developments in Family Structure Measurement

Family structure broadly refers to the context within which children are born and socialized, a situation created by the relationships between parents. The nature of the relationship between parents is important because it affects both the parenting behaviors and resources that contribute significantly to child well-being (Brown, 2010; Crosnoe & Cavanagh, 2010). Changes in divorce, cohabitation, non-marital childbearing, marriage, and remarriage behaviors have increased the complexity of parental relationships and therefore the experiences of their children (Brown, 2010). These changes also stimulated empirical work in this area and the evolution of the conceptualization and measurement of family structure that has enriched the field.

The increase in complexity and accuracy of measures of family structure has enabled researchers to create refined family types that improve our understanding of the importance of family structure to child outcomes (Demo & Cox, 2000; Wu & Martinson, 1993). Most of the research in the last decade has continued this trend of moving from simple measures of parental marital status that contrasted two biological parent with non-two biological parent families to measures that are more dynamic. This movement facilitated the capture of the immediate family

structure as well as relationship transitions. This dissertation continues this progression by expanding the conceptualization of family structure to include blended families and starting a discussion on how best to measure this relatively new family form. Measurement of family structure transitions is beyond the scope of this study.

Before proceeding to the discussion of blended families, it is necessary to discuss briefly the most important forms that the conceptualization and measurement of family structure have taken in the field. To illustrate the changes, I chose and grouped several studies into three broad categories (see Appendix 1). I selected these specific studies because they are among the first to recognize the need for expanding the existing measures of family structure. Each study contains detailed information about the creation of each measure and improvements over previous measures. I organize the studies to reflect major changes in family structure to date. The first set of studies contrasts children in two biological parent versus those in non-two biological parent families. The second set focuses on the changes brought about by the increase in cohabitation. The most recent development has been the distinction of blended families in stepfamily research. Each of these changes necessitated improvements in the measurement of family structure and consequently a systematic progression away from crude measures.

The changes observed across the three groups of studies have improved our understanding of how the living arrangements of children are associated with their well-being. With each refinement, there has been an expansion of family categories, which has reduced the confounding effects of family structure, and allowed the distinct experiences of each arrangement to be delineated. Quantitatively distinguishing the effect of each family type on child well-being enables better assessments of which arrangements are worse for children. It also facilitates the expansion and clarification of the theoretical mechanisms linking family structure

to child outcomes. Collectively, these refinements in measurement have precipitated the rapid growth of family structure research and made significant contributions to social policy and American family life.

Two Biological Parent versus Non-two Biological Parent Families

Initial measures of family structure were simple, and by current standards, crude, relying almost entirely on measures of parents' current marital status (Demo & Cox, 2000; Wu & Martinson, 1993). Research during this early/first period simply studied family structure effects on child outcomes by comparing single parent families to married two-parent families. The Moynihan Report provided the impetus for comparing these two union types (Moynihan, 1965; Duncan and Duncan, 1969). The report argued that the poverty experienced by African Americans was transmitted from one generation to the next through culturally dictated family practices that favored single mother households over male-headed two biological parent families. Moynihan (1965) explained that several historical structural conditions including slavery, Jim Crow, and urbanization

> forced [the African American community] into a matriarchal structure which, because it is to out of line with the rest of the American society, seriously retards the progress of the group as a whole, and imposes a crushing burden on the Negro male and, in consequence, on a great many Negro women as well. (P. 29).

According to the Moynihan report, single mother families provided fewer benefits to children, predisposing them to poverty. The single mother family symbolized matriarchy, which was viewed as maladaptive compared to the male-headed two-parent biological family. After the publication of this report, it became important to disentangle cultural contributors from the structural conditions that led to economic deprivation.

Duncan and Duncan (1969) is an example of research that sought to evaluate the claims of the Moynihan Report by comparing children living with both parents to single mothers. Using data from the Current Population Survey, they examined the relationship between family structure and occupational attainment. In their study, a two biological parent family consisted of children who lived with both biological parents up until age sixteen. As scholars at the time did not distinguish between the various types of single-mother families, they defined non-two biological parent families as respondents who were single for whatever reason. Therefore, a single parent family contained children and their biological mother or father, who was never married, widowed, divorced, or separated. Duncan and Duncan found that, irrespective of race, the effect of men's educational qualifications on occupational status was stronger for men from (married) two biological parent families than men reared in single-mother families. Socioeconomic characteristics of the families they grew up in did not fully explain this difference.

The approach of comparing single to two-parent families was later criticized for confounding family structure with economic deprivation. McLanahan (1985) argued that even though these studies controlled for the educational and occupational status of the head of the household, these controls were inadequate in comparisons of one- and two-parent families. Education and occupational status are good indicators of the socioeconomic circumstances of male-headed households but are inadequate for female-headed households. Therefore, even though individuals from single-mother families had a greater risk of poverty compared to individuals from two-parent biological families, it remained unclear whether this was due to family structure. Please note here that "risk" refers to the demographic concept "exposure to risk" which is the likelihood of an event happening to individuals who are exposed to the event

(Rowland, 2003:31). One of the steps taken to rectify this problem was a further differentiation of the single-parent category (e.g., single became divorced/separated or widowed). This allowed researchers to distinguish the effects caused by the absence of parents from those caused by marital disruption (e.g. McLanahan, 1985; McLanahan, 1988).

Using data from the High School and Beyond study, Astone and McLanahan (1991) extended the family structure and child well-being literature by further expanding the categories of family structure. They used comparisons among children living within stepfamilies, single parent, no biological parents, and two biological parent families, to assess whether the number of parents was important to high school completion. They found that children from two biological parent families had significantly higher levels of academic achievement when compared with children from single parent and stepparent families, even after controlling for demographic and socioeconomic variables. Further research has shown that, when compared with children from two biological parent families, children from stepfamilies also exhibit more internalizing and externalizing behavior, and are more likely to become teenage parents, marry early, and divorce (Stewart, 2007; Hetherington & Jodl, 1994). Even though stepfamilies have two parents and children are provided with comparable economic resources as two biological parent families, they remain disadvantageous to child well-being (Amato, 2005).

The changes in the one-point-in-time classification of parental marital status did much to foster growth in research on divorced parents and stepfamilies. However, by the beginning of the new millennium, the limitations of using a less refined measure were well documented (Demo & Cox, 2000). High rates of divorce, remarriage, and the separation of childbearing from marriage led to the growth in cohabitation. Additionally, the emergence of the post-divorce stepfamily made the living arrangements of children increasingly fluid. The expansion of cohabitation and

the post-divorce stepfamily led to the next set of studies that distinguished marriage from cohabitation.

Marriage versus Cohabitation

Dramatic increases in cohabitation during the 1980s have made studying the well-being of children in this living arrangement very important. At the same time, however, the transitory nature of these relationships made them difficult to measure. Prior to refinements in measurement, a significant proportion of parents whose marital status was classified as single were actually living with a cohabiting partner. Identifying this cohabiting group necessitated the use of household rosters that mapped relationships between household members to the head of the household in order to capture better the complexity of family life (e.g. Manning & Lichter, 1996; Manning & Smock, 1997). The household roster ultimately made it easier to distinguish between single parent and cohabiting families.

Incorporation of information from household rosters improved the literature on the living arrangements of children in two ways. First, it became clear that children who lived with unmarried mothers also shared their household with extended family members and/or their mother's partner (Bumpass & Lu, 2000). Second, children who lived in cohabiting families, when compared with those in married families and single-mother families, were economically worse off than those in married families were, but were better off when compared with those in single-mother families (Manning & Lichter, 1996; Manning & Brown, 2006). The socio-demographic characteristics of parents fully explained the differences in child poverty between married and cohabiting stepfamilies but only did so partially between married two biological parent families and other two parent families (Manning & Brown, 2006).

While the inclusion of cohabiting parents was a significant improvement, the measurement of cohabitation remained inadequate. The initial household rosters mapped only the relationship of each household member to the head of the household. Thus, researchers could not define relationships among other household members that did not involve the head of the household. Consequently, studies often failed to capture the complexity of contemporary families (Brown & Manning, 2009). Better measures of cohabitation were subsequently developed based on questions about relationship history, household rosters that mapped relationships among all household members, and items that explicitly measured the presence of unmarried partners in the household (e.g. Manning & Lamb, 2003; Brown, 2006).

Research exploiting these refinements has demonstrated considerable heterogeneity within cohabitation. Manning and Lamb (2003) used data from National Longitudinal Study of Adolescent Health (Add Health) to compare (married) two biological parent families with single-mother, cohabiting stepparent and married stepfamilies. They showed that compared to children from two biological parent families, children in cohabiting stepfamilies had higher levels of child delinquency and lower levels of cognitive development. Neither socioeconomic nor demographic characteristics fully explained differences between the two groups. When Manning and Lamb (2003) compared married stepfamilies to cohabiting stepfamilies (the reference group), they found that children in married stepfamilies fared better. The inclusion of demographic and socioeconomic characteristics of married parents fully explained this advantage. Using the same data set and family structure measure,[1] Brown (2006) found that children from cohabiting stepfamilies were more delinquent and depressed, and had lower levels of school engagement

[1] The family structure measure used in both papers have the same family structure categories, however, the Manning and Lamb (2003) used mother reports of family structure while Brown (2006) used adolescent reports of family structure.

than children from two biological parent families. In concert with Manning and Lamb (2003), neither socioeconomic nor demographic characteristics fully explained the differences between children from cohabiting stepfamilies and those from two biological parent families.

In sum, studies expanding measures of family structure to include cohabitation find that that children in cohabiting families experience more economic hardship and worse cognitive and school outcomes than those in two biological parent families, and this is more acute in cohabiting stepfamilies. The economic disadvantages experienced by cohabiting families are partly a result of their lower levels of education and income relative to married parents. Children from cohabiting families do fare better economically than children from single parent families (Manning & Lichter, 1996). Measures of economic resources that include the income of a cohabiting partner show that it does alleviate children's economic hardship. The added income, however, does not seem to be sufficient to ameliorate all the disadvantages of cohabitation. Even after controlling for socioeconomic characteristics, children from cohabiting families have lower levels of academic achievement and greater levels of behavioral problems than children from two biological parent families had (Manning & Lamb, 2003). Specifically, compared to their counterparts in two biological parent families, children from cohabiting stepfamilies exhibit lower levels of cognitive development, report lower grade point averages, and display greater delinquency and school problems (Manning & Lamb, 2003).

Blended Families

In the last decade, the growth and differentiation of the stepfamily has made it important to revisit the measurement of family structure. The use of household rosters and relationship histories has allowed researchers to identify emerging complex stepfamily forms. Two important changes are the increase in cohabiting step- and blended families. Remarriage is no longer a

defining characteristic of stepfamilies because of the large proportion of stepfamilies that are formed through cohabitation (Bumpass & Lu, 2000). However, the distinction is important because researchers have found that children in cohabiting stepfamilies have lower levels of well-being than those in married stepfamilies (Brown, 2006; Manning & Lamb, 2003). Family researchers usually identified a stepfamily by the presence of a stepparent in a two-parent household but this may now be inadequate because of blended families. Stepfamilies become blended families after the union produces a child; therefore, the presence of a stepparent is insufficient to distinguish stepfamilies from blended families. The family structure will vary by which child is the focal child because one child lives in a stepfamily and the other, in a two biological parent family. Addressing this problem is key because the distinction between blended, two biological parent, and stepfamilies may prove important to understanding the relationship between family structure and child well-being.

In determining family structure, researchers often misclassified blended families because they only considered the relationship between the focal child and the parents but not the relationship between the focal child and other children in the household. Consequently, an additional step in assessing family structure is necessary to identify a blended family. After the relationship between the focal child and both parents in the household has been determined, the relationship between this child and other children in the household must be identified. If the focal child has half-siblings in the household, they are defined as being part of a blended family.

All seven studies on blended families use some variant of this approach (Ginther & Pollak, 2004; Evenhouse & Reilly, 2004; Gennetian, 2005; Halpern-Meekin &Tach, 2008; Strow & Strow, 2008; Hofferth, 2006; Hofferth & Anderson, 2003). I include these studies because of their relevance to the dissertation. Table 1 summarizes the explanatory and outcome measures,

data, analytic strategies and findings of the seven studies. I will now review the ways in which these researchers approached the measurement of blended families, their analytic strategies and what they found using these measures.

Research on Blended Families: As indicated in Table 1, blended family researchers use three data sets to study these families: National Longitudinal Survey of Youth (NLSY); Panel Study of Income Dynamics (PSID); and National Longitudinal Study of Adolescent Health (Add Health). These data sets allow researchers to study the relationship between blended families and child well-being at three developmental stages: childhood, adolescence, and young adulthood. Most studies focus on childhood and cognitive and educational outcomes. Variations in the household roster variables in each data set influence the measurement of family structure, but all measures of the blended family were comparable.

Researchers take two approaches to measuring blended families. Some researchers conceptualize blended families as a distinct family structure, and as such, distinguish it from stepfamilies. The first four studies are examples of this. Others view blended families as stepfamilies with half-siblings. The last three (Hofferth, 2006; Evenhouse & Reilly, 2004; Hofferth & Anderson, 2003) take this approach. While the distinction may seem trivial, it shapes the interpretation of the relationship between blended families and child well-being. Those who use the former approach attribute the disadvantage of shared children in blended families to the presence of half-siblings. Researchers from the latter perspective see the presence of a stepparent (father) as the source of the disadvantage. This difference in conceptualization also affects the methods used to model the relationship between growing up in a blended family and child well-being.

Table 1: Studies of Blended Family Associations with Child Well-Being

Author(s)	Data	Family structure measure	Child Well-being Outcome(s)	Analytic Strategy	Compared to Two biological parent Families	Half-sibling comparisons
Gennetian (2005)	NLSY79	• Single mother - marital birth and non-marital birth; Stepfather family - marital birth and non-marital birth; Two biological parent family - marital birth and non-marital birth • Single mother - blended and non-blended; Stepfather family - blended and non-blended; Two biological parent family - blended and non-blended	Child: Cognitive development • Peabody Individual Achievement Test (PIAT) • Home Observation for Measurement of the Environment (HOME)	Between-family structure comparisons: two biological parent family (reference group)- OLS & fixed-effects Between-half-sibling comparisons	children from blended families perform worse	no difference
Ginther & Pollak (2004)	NLSY79, NLSY-CHILD and PSID	Two biological parent, single (biological) parent, alternate family structures and blended families	Child: Cognitive development - PIAT Adult: Educational Attainment - Years of schooling; Graduate from high school; College attendance; Graduate from college	Between-family structure comparisons: two biological parent family (reference group)- OLS Between-half-sibling comparisons	children from blended families perform worse	no difference
Strow & Strow (2008)	NLSY-CHILD	Two biological parent, single-mother, step-, and three types of blended families: shared child with a maternal half-sibling; shared child with paternal half-sibling; and stepchild with maternal half-sibling	Child: • Cognitive development - PIAT • Child behavior problems - Behavioral problems index (BPI)	Between-family structure comparisons: two biological parent family (reference group) - OLS	children from blended families perform worse	N/A
Halpern-Meekin & Tach (2008)	Add Health Sibling Oversample	Two-parent families: two biological parent families; shared children in blended families; stepchildren in blended families; and stepchildren in stepfamilies	Adolescent: GPA, School detachment, Delinquency and Depressive symptoms	Between-family structure comparisons: two biological parent family (reference group)- HLM	children from blended families perform worse	N/A
Evenhouse & Reilly (2004)	Add Health Sibling Oversample	Two biological parent; single mother; "Brady Bunch" (both partners have children from previous relationships in the household); "pure" (only one partner has children) stepmother and stepfather families; and two types of blended families: stepmother and stepfather families with half-siblings	Adolescents: 33 measures of child well-being broadly divided into five categories: education, risky behaviors, child social networks, parent-child relationship quality, and emotional health	Between-family structure comparisons: two biological parent family (reference group) – fixed-effects Between-half-sibling comparisons	children from blended families perform worse	Stepchildren in blended families worse than their half-sibling
Hofferth & Anderson (2003)	PSID-Child Development Supplement (CDS) 1997	Two biological parent; married stepmother and married stepfather families with stepchildren; married stepmother and married stepfather (blended) families with half-siblings; cohabiting two parent biological; cohabiting stepfather; single father families	Fathers' investment in children: • Time spent with children • Types of activities • Parental warmth • Fathering motivation	Between-family structure comparisons: children living with a biological father (reference group) – OLS Between-half-sibling comparisons	children from blended families perform worse	no difference
Hofferth (2006)	PSID-CDS 1997	Two biological parent; married stepmother and married stepfather families with stepchildren; married stepmother and married stepfather (blended) families with half-siblings; cohabiting two parent biological; cohabiting stepfather; single father families	Child: • Cognitive development - Woodcock-Johnson Revised Test of Basic Achievement • Child behavior problems - Behavioral problems index (BPI)	Between-family structure comparisons: children living with a biological father (reference group) – OLS Between-half-sibling comparisons	children from blended families perform worse	no difference

Most of the blended family studies use a two-tiered analytic strategy. The first tier consists of between-family comparisons that compare children in blended families to those in two biological parent families. All seven studies make this comparison. The four studies that identified blended families as a distinct group make direct comparisons between this family type and two biological parent families. The other three compare stepfamilies to two biological parent families. The second tier involve within-family comparisons that compare half-siblings in the same family to each other. Five of the seven studies made this comparison to determine if shared children have the same levels of disadvantage as their half-siblings (Hofferth, 2006; Gennetian, 2005; Ginther & Pollak, 2004; Evenhouse & Reilly, 2004; Hofferth & Anderson, 2003). Four of the five studies made the comparison by restricting the sample to blended families and used the shared biological child as the reference group (Hofferth, 2006; Ginther & Pollak, 2004; Evenhouse & Reilly, 2004; Hofferth & Anderson, 2003).

Controlling for economic and demographic characteristics of families, the between-family comparisons consistently show that children from blended families have lower levels of well-being than children from two biological parent families are. They have lower levels of cognitive development and educational achievement than children from two biological parent families do (Gennetian, 2005; Ginther & Pollak, 2004; Strow & Strow, 2008; Halpern-Meekin &Tach, 2008; Hofferth, 2006; Evenhouse & Reilly, 2004). The results for behavioral problems are mixed. On the one hand, Strow and Strow (2008), Halpern-Meekin and Tach (2008), and Evenhouse and Reilly (2004) find that these children have more behavioral problems in childhood and more delinquency in adolescence than children from two biological parent families. On the other hand, Hofferth (2006), using the same childhood measure for behavioral problems as Strow and Strow, finds the opposite. Children from blended families also have lower

levels of psychological well-being and father investment when compared to their counterparts from two biological parent families (Halpern-Meekin &Tach, 2008; Hofferth & Anderson, 2003).

The findings for the within-family comparisons of half-siblings are mixed. Net of controls for economic and demographic characteristics of families, most studies find that there are no differences between half-siblings (Gennetian, 2005; Ginther & Pollak, 2004; Strow & Strow, 2008; Halpern-Meekin &Tach, 2008; Hofferth, 2006). In contrast, Evenhouse and Reilly (2004) find that the half-sibling who is a stepchild fare worse than their half-sibling. Studies that find no difference between half-siblings also find that they are more disadvantaged than their counterparts in two biological parent families are. Hofferth and Anderson (2003) argue that these findings indicate that all stepfathers invest less in their children than do biological fathers. However, stepfathers that make the transition to blended families invest more and equitably in their children when compared with stepfathers who do not make this transition. Lower levels of well-being in these instances cannot be attributed to differences in biological relatedness.

In this study, I continue the evolution of family structure measurement by differentiating cohabiting blended families from married blended families and exploring the difficulties involved in measuring blended families. Cohabiting blended families may hold different consequences for child well-being than those of stepfamilies and married blended families. Few family structure studies examine sibling relationships and it is unexplored in the blended family literature. Family researchers have examined the link between family structure and first union formation but not for children from blended families. I hope to add substantively to our knowledge of the family structure correlations with first union formation, and those between family structure and family processes in the form of sibling relationships.

Family Boundary Ambiguity and Family Structure Measurement

The review shows that the approach taken by blended family researchers works, but the literature on family boundary ambiguity suggests it is necessary again to improve the measurement of family structure. There is very limited research on the way in which family boundary ambiguity (the discrepancy in reporting who is a family member) compromises family structure measurement. As already discussed, the incomplete institutionalization hypothesis suggests that it should be worse in complex families. What little empirical research there is appears to support this hypothesis. Brown and Manning (2009), using Add Health, find that family boundary ambiguity (1) occurs in 11% of mother-child pairs, (2) disproportionately affects complex families, particularly cohabiting families, (3) compromises family relationships, and (4) leads to differences in family structure effects that depend on whose report of family structure is used. Similarly, White (1998) using the NSFH, finds that (1) between 15% and 16% of individuals under- or over-report the number of siblings they have at two different waves of the survey, and (2) the discrepancies are more likely for complex families.

As mentioned earlier, the half-sibling relationship is key to correctly identifying blended families. Sibling pair reports that can be confirmed using another source may be a critical step forward in blended family measurement. Having this third report may reduce some of the subjectivity in the reports of family structure, and therefore family boundary ambiguity. While it is unclear how family boundary ambiguity affects sibling reports of family structure, the theoretical and empirical findings suggest that such reports should be affected in the same way as mother-child pairs. However, whether this is the case is an empirical question that I attempt to answer in chapter 6.

CHAPTER IV: FAMILY STRUCTURE, SIBLING RELATIONSHIP QUALITY, AND FIRST UNION FORMATION

In this chapter, I review the literature on how family structure is associated with sibling relationship quality and first co-residential union formation. A discussion of how sibling relationships may be associated with union formation then follows. As was pointed out in the first chapter, there is a paucity of studies on the relationship between family structure and both of these outcomes. Additionally, the measures of family structure used in much of this research ranges from crude dichotomies to more refined measures that still lack important distinctions such as cohabiting and blended families. Furthermore, there is no research, to my knowledge, that directly links sibling relationship quality to union formation. I therefore use the existing research to extrapolate this relationship. Examining the possible links between sibling relationship quality and first union formation is the beginning of a new thread that links the fledgling research on sibling influence to union formation and blended families. The chapter concludes with the hypotheses or theoretical expectations derived from prior empirical evidence and theoretical arguments.

Family Structure and Sibling Relationships

Studies have shown that sibling relationships are related to individual development but relatively little is known about how these relationships are related to family structure (Deater-Deckard, Dunn, & Lussier 2002; Updegraff et al., 2005). This is a significant omission given the extensive literature linking other family relationships (e.g. parent-child relationships) to family structure and child well-being. Most individuals spend a large portion of their early to middle childhood with a least one sibling. Siblings are a primary source of support, stress and socialization. They also play an important role in the development of empathy, pro-social and antisocial behaviors, and a generally healthy psychological profile (Hetherington et al., 1999;

Kramer & Bank, 2005). Family structure has not factored prominently into sibling research for two reasons. First, the majority of the literature on sibling relationships has come from family development and psychology scholarship where there is less focus on structural variables (Bahm et al., 2008). Consequently, most of these studies use family structure as a control variable or exclude it altogether. Second, the focus has been on the linkages between sibling relationships and child development.

In Table 2, I describe in detail seven studies of sibling relationship quality that use measures of family structure. Most of the research on sibling relationship quality did not include measures of family structure, but controlled for family structure by selecting small non-representative samples of two biological parent families with a dyad of full siblings (Whiteman & Christiansen, 2008; Updegraff et al., 2005; Stoker & Youngblade, 1999). These studies utilize family structure measures that range from two and single parent families with a dyad of either full, half- or stepsiblings to more complex measures that include two and single parent families with multiple sibling dyads within a family (Jenkins et al., 2005; White & Riedmann, 1992). Sibling dyads in two-parent families consist of the following: full siblings in two biological parent families; full siblings in stepfamilies; half-siblings in stepfamilies; and stepsiblings in stepfamilies. Most studies measure sibling relationship quality by using reports from a single sibling. Jenkin et al. (2005), Deater-Deckard, Dunn, and Lussier (2002) and Anderson (1999) are exceptions because reports of sibling relationship quality were from mothers or two siblings.

The studies in Table 2 are critical because they combine complex measures of family structure with detailed measures of sibling relationship quality. Unfortunately, there are three major limitations. First, only three of these studies explicitly examine the relationship between family structure and sibling relationships (Deater-Deckard, Dunn, & Lussier 2002; Anderson,

Table 2: Studies of Family Structure and Sibling Relationship Quality

Author(s)	Data	Family structure measure	Type of siblings	Sibling relationship quality	Findings
Anderson 1999	NEAD – Non-shared Environment in Adolescent Development	Married two biological parent and : stepfamilies with full siblings; stepfamilies with half-siblings and; stepfamilies with stepsiblings	Adolescent: Same-sex sibling pairs - stepsiblings, half-siblings and full siblings	Negativity – Rivalry, aggression, avoidance, Positivity - teaching, empathy and companionship	Positivity: full siblings (two biological parent and step-) = half-siblings = stepsiblings Negativity: full siblings (two biological parent and step-) = half-siblings > stepsiblings
Deater-Deckard, Dunn, & Lussier (2002) (British study)	ABSS - Avon Brothers and Sisters Study	Two biological parent (married and cohabiting); stepfather & stepmother (married and cohabiting); complex families (Brady bunch and blended families) and; single mom families	Children: Both same and opposite sex Full, half- and stepsibling dyads and triads	Positivity - Closeness, emotional support, warmth & nurturing behavior Negativity – disagreements, physical fighting, & reckless behavior	Positivity: two biological parent = step- = complex step- = single mother Negativity: single mother > step- = complex step- = two biological parent Positivity: full siblings (two biological parent and step-) = half-siblings = stepsiblings Negativity: full siblings (two biological parent and step-) > half-siblings = stepsiblings
Jenkins et al. (2005) (British study)	ALSPAC - Avon Longitudinal Study of Parents and Children	Two-parent (omitted group) - two biological parent, stepfather, & complex Single parent .	Multiple dyads within families: Full, half, and stepsiblings	Negativity (over time) - Mother reports of: Disputes, out-of-control behavior, arguments & physical fights.	Negativity overtime: full siblings (two biological parent and step-) > half-siblings ; full siblings (two biological parent and step-) = stepsiblings; and half-siblings = stepsiblings This relationship was moderated by maternal preferential treatment: negativity overtime was greater for single mother families
Mekos, Hetherington, and Reiss (1996)	NEAD	Married Two biological parent (omitted group), Stepfamily with full siblings, & stepfamily with stepsiblings	Adolescents: One same-sex Full and stepsibling dyads	Siblings' problem behaviors (substance use and deviance) Parents' preferential treatment (warmth, conflict, monitoring & discord)	Preferential treatment:: stepfamily with stepsiblings > two biological parent families; Stepfamily with full siblings = two biological parent families Siblings problem behaviors: stepfamily with stepsiblings > two biological parent families; Stepfamily with full siblings = two biological parent families Siblings that received negative preferential treatment had more substance use problems.
Ganong and Coleman (1993)	Non-random sample of stepfamilies	Married Stepfamilies	Children, teens and young adults: Full, half- & stepsiblings	Stepsibling interaction scale (play, fight, teach, & help)	Stepsibling interaction scale: full siblings > stepsiblings; half-siblings > stepsiblings Stepfamilies with stepsiblings had more problems than those without stepsiblings.
White and Riedmann (1992)	NSFH 1987 & 1992	Married two biological parent & stepfamilies (omitted group)	Adults: Full, half and Stepsiblings. Could not distinguish step- from half siblings	Sibling relationship quality: contact - physical visits, letters & telephone	Contact: full siblings in two biological parent families > half/stepsibling in stepfamilies In stepfamilies with multiple sibling types, having a full sibling decreases contact with half/stepsiblings.
Richmond, Stocker, and Rienks (2005)	Random sample of middle class white families	Two biological parent (beginning of the study): married (omitted group) and divorced/separated	Children & adolescents: Full sibling dyads	Sibling relationship quality (over time): warmth and conflict Parents' preferential treatment (over time)	Irrespective of the marital status of parents: Sibling relationship quality was inversely related to depression Parents' preferential treatment was positively related to both depression and externalizing behavioral problems

1999; Mekos, Hetherington, & Reiss, 1996). Second, none of these studies identifies cohabiting or blended families as a distinct family structure. Third, these studies use samples that are not representative of the U.S. population (except for the White & Riedmann, 1992). While most use random samples, their respondents were from stable married, white middle class families.

Sibling relationships are complex and require measures that fully capture this complexity. These relationships are regarded as being emotionally ambivalent because they fluctuate between intense warmth and conflict (Deater-Deckard, Dunn, & Lussier, 2002). Most studies try to tap into this duality by measuring the positive and negative aspects of sibling relationships separately. There is considerable variation in the indicators of positive or negative sibling relationship quality. For example, Anderson (1999) measures positivity using empathy, teaching behavior and companionship, while measuring negativity using aggression, avoidance behavior and rivalry. Deater-Deckard, Dunn, and Lussier (2002) use closeness, emotional support and warmth to measure positivity, and use the frequency and intensity of disagreements, physical fights and reckless behavior to measure negativity. White and Riedmann (1992) use the frequency of contact with siblings, whether through visits or phone calls, or both. It is unclear whether these differences in indicators affect research findings.

Studies that examine the associations between family structure and both the positive and negative aspects of sibling relationships find that most of the differences are centered on negative interactions (Deater-Deckard, Dunn, & Lussier, 2002; Anderson, 1999). Siblings in single parent families have significantly higher levels of negativity compared to siblings in all other family configurations (Jenkins et al., 2005, Deater-Deckard, Dunn, & Lussier, 2002). Among two-parent families, full siblings from two biological parent families and full siblings from stepfamilies have higher levels of negativity compared to stepsiblings in stepfamilies (Deater-

Deckard, Dunn, & Lussier, 2002; Anderson, 1999). There are no clear differences in comparisons between full siblings in two biological parent and full siblings in stepfamilies. Comparisons of full siblings to half-siblings and half-siblings to stepsiblings produce mixed results. Anderson (1999) finds that full and half-siblings had significantly higher levels of negativity compared to stepsiblings but are not significantly different from each other. Deater, Dunn, and Lussier (2002) and Jenkins et al. (2005) find that full siblings have significantly more negativity than half-siblings and stepsiblings, but they failed to find any difference between half- and stepsiblings.

Stepsiblings have the lowest level of negativity among all sibling types. This finding appears counterintuitive because stepsiblings have significantly more problem behaviors than siblings in two biological parent families (Mekos, Hetherington, & Reiss, 1996) and positive sibling relationship quality ameliorates some of these disadvantages (Richmond, Stocker, & Rienks, 2005). The greater disadvantage of stepsiblings is probably best understood in the wider context of their families. Stepsiblings not only have the lowest level of negativity among sibling types, they also have the lowest level of interaction (Ganong and Coleman, 1993). This suggests that there are fewer disagreements and quarrels because stepsiblings interact less with each other. Another contributor is preferential treatment of siblings by parents. Stepsiblings experience more preferential treatment than siblings in two biological parent families do. Siblings who are less favored by a parent have more behavioral and psychological problems (Mekos, Hetherington, and Reiss, 1996; Richmond, Stocker, & Rienks, 2005). The combination of all these factors produces the paradox of fewer reports of negativity but more problem behaviors.

Childhood Family Structure and First Union Formation in Adulthood

As with other child well-being outcomes, the relationship between family structure and union formation is complex. Researchers who study union formation focus on three outcomes: timing to first union, the propensity to form first unions through cohabitation and marriage, and the likelihood of transition from cohabitation to marriage. The focus in this study is the effect of family structure on the timing of a first co-residential union and on cohabitation and marriage rates. I review the eleven studies shown in Table 3 because each examines union formation (first co-residential union) and include measures of family structure as the primary explanatory variable or as a control in the analyses. Most studies use event history analysis with models that make the following comparisons: any union vs no union; (in competing risk models) cohabitation vs marriage and marriage vs cohabitation; and marriage (ignoring cohabitation) vs no union. A few use logistic regression models to confirm whether individuals who form unions, do so by cohabitation or marriage. For most of these studies, the observation period for first union formation is between the ages of 15 to 24 years.

Timing of First Union Formation

The studies that examine the timing of first union formation show mixed results. Some studies, typically those that measure family structure as a dummy variable (two biological parent vs. non-two biological parent families), find that family structure is not related to the timing of the first union formation (Xu et al., 2005; Lloyd & South, 1996). Others find that individuals from non-two biological parent families form first unions at younger ages than individuals from two biological parent families (Ryan et al., 2009; Cavanagh, Crissey & Raley, 2008; Glick et al., 2006; Wolfinger, 2003; Teachman, 2003a, 2004; Michael & Tuma, 1985). I describe the ways that specific family types are related to first union formation in the following paragraphs.

Generally, the results for children from single-parent households – primarily mother-only households – are mixed. Some researchers find (net of controls) that adults who spent time in single mother families are not significantly different from adults from two biological parent families, in the age at which they first married (Uecker & Stokes, 2008; Xu et al., 2005; Lloyd & South, 1996; Michael &Tuma, 1985). Others find that children living in single mother families formed first unions at younger ages (Ryan et al., 2009; Teachman, 2003a; Wolfinger, 2003). Neither demographic, socioeconomic nor religious characteristics mediate the relationship between living in a single mother family and age of first union formation but there is evidence that gender and age moderate the relationship. Glick et al., (1991), for example, find that women from single mother families form their first union at older ages than women from two biological parent families.

The findings for non-two biological parent families are less heterogeneous. Only two of these studies distinguish cohabiting families as a family type. Compared to children from married two biological parent families, Teachman (2003a) finds that children who ever lived in a cohabiting stepfamily form first unions at younger ages (net of socio-demographic characteristics). However, living in a cohabiting two-parent biological family had no effect on the age that children formed first unions. Similarly Ryan et al., (2009) finds a correlation between spending time in a cohabiting stepfamily and children's early cohabitation. Individuals from remarried stepfamilies, when compared to children from two biological parent families (and net of controls), form first unions at younger ages and are more likely to form both types of unions (Teachman, 2003a, 2004; Thornton, 1991). Of note, however, is that Axinn and Thornton (1993) find that being a member of a married stepfamily is not related to the timing of first union formation.

Table 3: Studies of the Relationship between Family Structure and Union Formation

Study	Data	Family structure	Outcome	Result
Lloyd & South, 1996	NLSY, PUMS-D	Two biological parent vs. non-two biological parent (omitted group)	Transition to First marriage	Two biological parent family = non-two biological parent irrespective of race.
Uecker & Stokes, 2008	ADD Health	Two biological parent (omitted group), single-parent, stepfamily and other (no cohabitation)	Early first marriage	Two biological parent family = stepfamily = single parent = other family structure. If cohabited as adults then marry earlier.
Michael & Tuma, 1985	NLSY-79	Two biological parent (omitted group), single-parent, stepparent, and no parent	Early first marriage	Whites: stepparent > two biological parent; no parent > two biological parent; single parent = two biological parent Hispanic: stepparent = no parent = single parent = two biological parent Black men: no parent > two biological parent
Thornton, 1991	DMA	Two biological parent (omitted group), stepfamily, widowed –mother & divorced-mother	First union formation; first cohabitation; first marriage	Union: non-two biological parent > two biological parent Cohabitation vs. marriage: non-two biological parent > two biological parent Marriage vs. cohabitation: non-two biological parent = two biological parent Marriage vs. no union: stepfamily > two biological parent; widow = two biological parent; divorced = two biological parent
Axinn & Thornton, 1993	DMA	Two biological parent (omitted group), stepfamily, widowed –mother & divorced-mother	Rate of union formation; rate of cohabitation; rate of marriage	Union: widowed > two biological parent; stepparent = widow = divorced = two biological parent Cohabitation vs. marriage: non-two biological parent > two biological parent Marriage vs. cohabitation: non-two biological parent = two biological parent Marriage vs. no union: stepfamily > two biological parent; widow = two biological parent; divorced = two biological parent
Glick et al., 2006	NELS	Two biological parent (omitted group), stepfamily (cohabiting & married combined), single-mother (divorced & never married) & other	Early first marriage	Girls: stepparent > two biological parent; single-mother < two biological parent; other family = two biological parent Boys: stepparent > two biological parent; single-mother = two biological parent; other family = two biological parent
Wolfinger, 2003	GSS	Two biological parent, single-mother & stepfamily (single & step combined = divorced)	Early of first marriage	Stepfamily > two biological parent; single-mother > two biological parent
Teachman, 2004	NSFG	Two biological parent, (never married & divorce) single-mother & father, married stepfamily & other	Early first marriage Cohabitation before marriage	Timing: single parent > two biological parent; stepfamily > two biological parent Cohabitation: single parent > two biological parent; stepfamily > two biological parent
Teachman, 2003a	NSFG	Single-mother (both never married and divorced), married & cohabiting stepfamilies, cohabiting bio-family, other and two biological parent family	Likelihood of first union, Cohabitation & marriage	Union: married stepfamily > two biological parent; Cohabitation vs. marriage: non-two biological parent > two biological parent Marriage vs. cohabitation: married stepfamily > two biological parent; cohabiting stepfamily < two biological parent
Ryan et al., 2009	ADD Health	Single-mother (divorced & never married); cohabiting family; stepfamily; and two biological parent family (omitted group)	Early first union, Cohabitation & marriage	Marriage vs. no union: stepparent > two biological parent; single-mother = two biological parent; cohabiting family = two biological parent Cohabitation vs. no union: single > two biological parent; cohabiting family = two biological parent; stepparent = two biological parent Marriage vs. cohabitation: single < two biological parent; cohabiting family = two biological parent; stepparent = two biological parent
Xu et al., 2005	NSFH-1	Two biological parent and single-mother family (omitted group)	Timing to first marriage	single mother = two biological parent

Type of First Union

The findings for the type of first unions formed are more consistent than those for timing are. Compared to those from two biological parent families, persons who grow up in any type of non-two biological parent families tend to have lower rates of marriage, higher rates of cohabitation, and given a choice between the two, they are more likely to form a first union by cohabitation than by marriage. Only individuals who ever spend time in a married stepfamily have elevated rates of both cohabitation and marriage (Ryan et al., 2009; Teachman, 2003a, 2004). Most of these studies use competing risk models (except Ryan et al., 2009 that used multinomial regression models) but they vary in the type of non-two biological parent families researchers examined (Ryan et al., 2009; Teachman, 2003a, 2004; Axinn & Thornton, 1993; Thornton, 1991).

Competing risk models for cohabitation (treating marriage as a competing risk) show that, relative to two biological parent families, adult children who spend time in single-parent, cohabiting biological, cohabiting step-, and married stepfamilies have higher rates of cohabitation (Ryan et al., 2009; Teachman, 2003a, 2004; Axinn & Thornton, 1993; Thornton, 1991). The results of competing risk models for marriage (treating cohabitation as a competing risk) are complex. For individuals from single parent families, researchers either find that there is no difference (Teachman, 2003a; Axinn & Thornton, 1993; Thornton, 1991), or that they have lower rates of marriage than those from two biological parent families (Ryan et al., 2009). The results of comparisons between adults from cohabiting and two biological parent families are clearer. The risk of marriage for adults who grew up in biological families was the same irrespective of the marital status of their parents. Individuals from cohabiting stepfamilies have lower rates of marriage than two biological parent families (Teachman, 2003a; Ryan et al.,

2009). The results of comparisons between individuals from married stepfamilies and individuals from two biological parent families are mixed. Some researchers find that adults from married stepfamilies are no different from their counterparts from two biological parent families in their propensity to marry (Axinn & Thornton, 1993; Thornton, 1991). Others find that having a married stepparent increases the rate of marriage (Teachman, 2003a; Ryan et al., 2009).

A few researchers use logistic regression models to predict the likelihood of marriage or cohabitation among individuals who form first unions. Their results usually mirror the results of competing risk models (Teachman, 2003a; Ryan et al., 2009; Thornton, 1991). Specifically, individuals from non-two biological parent families (versus two biological parent families) are more likely to form their unions by cohabitation rather than marriage, except those from married stepfamilies who have higher rates of marriage (Teachman, 2003a; Ryan et al., 2009).

In conclusion, the relationship between family structure and first union formation is complex. Despite this complexity, one pattern is clear. Adults who spend time in families other than two biological parent families form first unions at younger ages and are more likely to form a first union through cohabitation. These results were robust in two ways. First, multiple researchers using different data sets replicate them. Second, the relationship persists after controlling for a variety of socioeconomic and demographic characteristics.

Sibling Relationship Quality and Adult Children's First Union Formation

Research on sibling relationship quality and union formation is sparse. The existing literature indicates that sibling relationship quality contributes to the development of interpersonal and relationship skills that are important to forming and maintaining intimate relationships (Updegraff et al., 2005; Conger et al., 2000). Sibling relationships serve as a critical context within families where individuals acquire relationship skills by learning from

and/observing their parents and siblings in their relationships and practicing these behaviors with their siblings. Individuals then go on to utilize these interactional skills in peer and intimate relationships (Updegraff et al., 2005; Conger et al., 2000). As such, sibling relationships affect individual well-being, adjustment, and therefore quality of life from childhood through to adulthood (Kramer & Bank, 2005). These characteristics are not simply produced through satisfaction with siblings but also through sibling influence.

Sibling relationships are most influential during childhood and early adolescence (Deater-Deckard, Dunn, & Lussier, 2002; Anderson, 1999). Sibling influence, particularly that of the older siblings, has been linked to an array of positive and negative behaviors during this period (Whiteman et al., 2007; Anderson, 1999; East, 1998b). Generally, researchers have found that younger siblings are more likely to model the behavior (positive or negative) of their older siblings if they have warm and supportive relationships with each other (Whiteman, Bernard & McHale, 2010; Whiteman & Christiansen, 2008). Updegraff, McHale and Crouter (2002) found that younger siblings who have close relationships with their older siblings also have close peer friendships.

We know very little about how sibling relationship quality is related to children's marriage or cohabitation in adulthood (Conger & Little, 2010). A few studies have found an association between the quality of family relationships and romantic relationships in early adulthood (Conger et al., 2000; Collins, Welsh & Furman, 2009). These studies suggest that it is the quality of parent-child relationships, not sibling relationships, that is associated with the quality of romantic relationships. Specifically, parent-child relationships are positively related to children's romantic-relationship behavior and therefore to romantic relationship quality. Parent-child relationship quality, sibling relationship quality, and parents' relationship quality are

positively correlated to each other but neither sibling relationship quality nor parents' relationship quality is associated with romantic relationship behavior (Conger et al., 2000).

The lack of evidence of a link may be a result of the decrease in prominence of sibling relationships as brothers and sisters establish their own families and careers (Conger & Little, 2010). Alternatively, a link between sibling relationship quality and romantic relationship quality may not be important to forming co-residential unions. Additionally, the lack of a relationship could be an artifact of the data used. Conger et al., (2000) is the only study that uses longitudinal data to explore the association (between sibling socialization and adult romantic relationships) and their sample is not representative of the U.S. population.

Theoretical Expectations

The review of the findings and theories discussed in this and preceding chapters raises the following questions:

1. How extensive is family boundary ambiguity in the measurement of blended families?
2. What proportion of the population live in two-parent blended families and how do they compare to two biological parent families?
3. How do sibling relationships differ in blended families compared to other families?
4. How does timing and type of first co-residential union formation for individuals from blended families compare to those from other families?
5. If there is a difference in the pattern of first union formation between blended and other families, is this difference mediated by sibling relationship quality?

My expectations are as follows:

How Extensive is Family Boundary Ambiguity in the Measurement of Blended Families?

Brown and Manning (2009) using data from wave 1 of Add Health, find that roughly 11% of all reports of family structure given by mothers and their adolescent children residing in the same household are discrepant. The inconsistency of these reports are worse for complex families and particularly bad for cohabiting stepfamilies. While this study also uses data from Add Health wave 1, the reports of family structure are from sibling pairs that reside in the same household. Sibling-pair relationship dynamics may be different from those in mother-adolescent child pairs. Consequently, the proportion of sibling pairs that will give inconsistent reports is unclear. However, I expect family boundary ambiguity to be positively related to family complexity and be worse for cohabiting families.

What Proportion of the Population Live in Two-parent Blended Families and How do they Compare to Two biological Parent Families?

Gennetian (2005) using nationally representative data (NLSY 79) estimates that almost half of all stepfamilies and fewer than 10% of two biological parent families are actually blended families. This suggests that the proportion of blended families should to be similar to that of stepfamilies. In Add Health, approximately 14% of all families are stepfamilies and approximately 58% are two biological parent families (Manning & Lamb, 2003). Therefore, I expect blended families to be roughly 13% of all families.

Blended families begin as stepfamilies. As a result, they will probably share similar social and demographic characteristics to stepfamilies. Compared to respondents from two biological parent families, respondents in blended families will probably have lower levels of socioeconomic achievement. The socioeconomic characteristics of cohabiting parents will be worse than that of married parents (Manning & Lamb, 2003; Manning, Smock, & Majumbar,

2004). The quality of sibling relationships in blended families will probably be similar to full siblings in stepfamilies but lower in quality compared to those in two biological parent families. Compared to respondents from two biological parent families, those from blended families will form unions at younger ages, cohabit more, and marry less.

How do Sibling Relationships Differ in Blended Families Compared to Other Families?

The incomplete institutionalization perspective suggests that the levels of boundary ambiguity increase with greater family complexity. Cohabiting families are more complex than married families and stepsibling and half-sibling relationships are more complex than full sibling relationships. Ambiguity will be highest in stepsibling relationships and lowest in full sibling relationships. The level of ambiguity may affect the negativity and positivity in sibling relationships. For instance, ambiguity makes stepsiblings less engaged with each other and therefore have lower negativity and positivity than other types of sibling relationships. Similarly, full siblings should have both high levels of negativity and positivity. Half-siblings should fall in the middle because they experience moderate levels of ambiguity in their sibling relationships. Most of the reviewed literature finds that family structure is more often correlated with negative sibling interaction (quarreling), but not positive interaction (affection). Given these findings, I propose the following:

Hypothesis 1: Sibling affection will not vary across family structure.

Hypothesis 2: Sibling relationships will be less negative in blended families than in families with full siblings (two biological parent, step-, and single parent families), but more negative than in stepfamilies with stepsiblings.

Hypothesis 3: Sibling relationship quality in married families will be less negative than that in cohabiting families.

How does Timing and Type of First Co-residential Union Formation for Individuals from Blended Families Compare to those from Other Families?

Adults who spent time in non-two biological parent families form first unions at younger ages and have higher cohabitation and lower marriage rates (Michael & Tuma, 1985; Ryan et al., 2009; Teachman, 2003a, 2004). Spending time in remarried stepfamilies predisposes children to early first union formation and increases the risk of both cohabitation and marriage. Exposure to a cohabiting stepfamily also increases the risk of early first union formation and cohabitation rates, but decreases marriage rates (Teachman, 2003a; Ryan et al., 2009). The same is true for spending time in a single-mother family (Teachman, 2004; Wolfinger, 2003). In keeping with these findings:

> **Hypothesis 4:** Adults from blended families and those from other non-two biological parent families will form unions at earlier ages than those from two biological parent families.
>
> **Hypothesis 5:** Compared to individuals from two biological parent families, individuals from cohabiting blended, cohabiting step-, and single-mother families will be more likely to form first unions through cohabitation, and less likely to form them through marriage.
>
> **Hypothesis 6:** Adults from married step- and blended families will be likelier to form both types of unions than counterparts from two biological parent families.

If there is a Difference in the Pattern of First Union Formation between Blended and Other Families, is this Difference Mediated by Sibling Relationship Quality?

Positive sibling relationships are negatively related to socio-emotional, psychological, and behavioral problems (Deater-Deckard, Dunn, & Lussier, 2002; Anderson, 1999). These relationships also help individuals to develop interpersonal skills that are necessary for forming

and maintaining peer and romantic relationships (Updegraff et al., 2005; Kramer & Bank, 2005). Additionally, siblings influence each other's behavior by acting as role models or providing opportunities or access to opportunities for siblings to learn and practice behaviors (Whiteman, McHale & Crouter, 2007; Whiteman & Christiansen, 2008).

Half-siblings who are biologically related to one parent in blended families may have poor stepparent-stepchild relationship quality. The stress from this relationship as well as the ambiguity associated with defining a half-sibling relationship may compromise sibling relationship quality. Weakened sibling bonds may provide less support and protection for individuals than those in better quality relationships. Individuals with poor sibling relationships may be find it easier to leave an unsupportive home environment by forming co-residential unions at younger ages (Hetherington & Jodl, 1994). Therefore:

> **Hypothesis 7:** Siblings with lower quality relationships will form first co-residential unions at younger ages than their counterparts with higher quality relationships.

Poor relationship quality may also result in poor interpersonal skills and peer relationships. Incompetence in intimate relationships may increase the chance of cohabiting unions but decrease the chance of marriage. Consequently:

> **Hypothesis 8:** Individuals who have lower quality sibling relationships will have higher rates of cohabitation and lower rates of marriage compared to individuals with higher quality sibling relationships.

The eight preceding hypotheses are summarized in tabular form in Table 4.

Table 4: Hypotheses

1) Sibling affection will not vary across family structure.
2) Sibling relationships will be less negative in blended families than in families with full siblings (two biological parent, step-, and single parent families), but more negative than in stepfamilies with stepsiblings.
3) Sibling relationship quality in married families will be less negative than that in cohabiting families.
4) Adults from blended families and those from other non-two biological parent families will form unions at earlier ages than those from two biological parent families.
5) Compared to individuals from two biological parent families, individuals from cohabiting blended, cohabiting step-, and single-mother families will be more likely to form first unions through cohabitation, and less likely to form them through marriage.
6) Adults from married step- and blended families will be likelier to form both types of unions than counterparts from two biological parent families.
7) Siblings with lower quality relationships will form first co-residential unions at younger ages than their counterparts with higher quality relationships.
8) Individuals who have lower quality sibling relationships will have higher rates of cohabitation and lower rates of marriage compared to individuals with higher quality sibling relationships.

CHAPTER V: METHODOLOGY

Data

I use waves 1 and 4 from the National Longitudinal Study of Adolescent Health (Add Health) for the analyses, except where noted. Add Health is a longitudinal nationally representative sample of adolescents in grades 7-12 selected from 132 high schools in the United States. Data from adolescents were collected during the first two waves using stratified random sampling and respondents subsequently followed in the third and fourth waves. Wave 1 was collected between 1994 and 1995; wave 2 was collected a year later in 1996; wave 3 was collected five years later in 2002 when respondents were aged 18-26; and wave 4 was collected between 2007 and 2008 when respondents were between 24 and 32 years old. At wave 1, there are 20,745 in the in-home sample with accompanying information from 17, 670 parents. Waves 2, 3 and 4 had 14,738, 15,197 and 15,701 respondents, respectively.

The in-home sample, which was randomly selected from the in-school sample, consists of a core sample and five supplemental samples (N = 20,745). The core in-home (N = 12,105) is made up of adolescent respondents in grades 7-12 who completed In-school Questionnaires and/or were listed on their school rosters (Harris, 2011). The five supplemental groups were selected based on information from the In-school Questionnaire. Specifically, the oversample included a genetic supplement, students who were of Chinese, Puerto Rican, or Cuban descent (or where Cuban), were disabled, and/or had highly educated African American parents. The genetic supplemental sample consists of four groups: twins, full siblings, half-siblings and unrelated adolescents living in the same household. The genetic sample was necessary because there were insufficient numbers of half-and stepsiblings in the in-home sample. The additional siblings were selected from schools that were not in the 132 schools were used for the in-school

sample. These adolescents were not part of the probability sample and had no information available to compute sampling weights (Chantala, 2001). To address the issue of missing weights, I include variables used to select the genetic oversample as control variables in the analyses (Winship & Radbill, 1994).

Add Health collects information on social, economic, psychological and physical well-being along with contextual data on the family, neighborhood, community, school, friendships, peer groups, and romantic relationships. It is particularly suited for this analysis for two reasons. Firstly, the data has detailed measures of household structure that are necessary to measure complex-family structures like blended families: the genetic oversample has sibling pair information that facilitate multiple-source reports of family structure. Secondly, Add Health collects information on the quality of respondents' relationships with both parents and siblings, in addition to the respondents' histories of co-residential union involvement.

Overview of the genetic oversample

Unique to Add Health is the genetic oversample (PAIRS data) of 3,139 sibling pairs raised in the same household and having varying degrees of genetic relatedness. These sibling pairs are interviewed at every wave with average response rates of over 90% (Harris et al., 2012). Respondents were selected for this supplemental sample if they indicated on the in-school survey that they had siblings of varying genetic relatedness living in the same household and were in grades 7- 12. There are four types genetic relatedness: twins (both monozygotic and dizygotic), full siblings, half-siblings, and unrelated adolescents (Table 5). Some of these pairs are also in the core in-home sample. Full siblings naturally occurred in large numbers in the in-home sample so they were not oversampled. Twins, because they were a special interest group, were automatically included in the in-home sample at wave 1. Half-siblings and unrelated

adolescents did not occur in large enough numbers in the core in-home sample and had to be oversampled from schools that were not in the Add Health study. As mentioned earlier, respondents who were not a part of the core in-home sample do not have weight information.

Table 5: Sample Sizes for Sibling Pairs by Type of Genetic Relatedness at Wave 1

Sibling pair type	Wave 1 (1995)
MZ	307
DZ	452
Undetermined twin type	25
Full siblings	1,251
Half-siblings	442
Unrelated	662
Stepsiblings	150
Adopted pairs	31
Adopted and biological child pairs	49
Aunt and uncle pairs	18
Cousin pairs	201
Foster children	273
Pairs from group homes	7
Pairs who are in-laws	12
Spousal pairs	16
Not related pairs (not in above categories)	151
Total	3,139

The inability to correct for design effects is unfortunate but the genetic oversample offers a considerable advantage in that it makes pairwise analyses possible using any measures available in any of the four waves of the Add Health. Sibling pairs can be decoupled reshaped, and merged with each wave. In the merge with wave 1, only 36 respondents that are in the genetic oversample are not in the in-home sample. I make use of this feature to assess family boundary ambiguity using sibling pair reports.

Samples

I use data from waves 1, 3, and 4 and the genetic oversample to create three analytic samples to achieve the study objectives. I use the first analytic sample to assess family structure

ambiguity and other problems of using the Add Health data to measure family structure. I include adolescents from wave 1 with parents who completed the parent questionnaire, and have one sibling (full, half-, or step-). To get a nationally representative estimate of the proportion of children who live in two-parent blended families, the second analytic sample includes adolescents who are in all three waves, have only one sibling, and have, wave 1 weights. To facilitate the analysis of sibling relationships and first union formation, the third sample includes adolescents who are in the genetic oversample, present in all three waves, and have only one sibling. I describe each sample in detail below.

***Analytic Sample* 1:** I use this sample to assess the extent of family boundary ambiguity in the family structure measure. The analytic sample consists of 611 pairs of full, half- and stepsiblings. From the initial sample of 3,139 sibling pairs, I dropped 1,011 pairs for the following reasons: they were not one of the four sibling pair types that were the focus of the analysis; they were from a family that had multiple sibling types in the oversample; and/or they had more than one sibling in their household. In the case of the latter, if a family had three pairs of siblings in the sample, I randomly chose one pair and deleted the other two pairs, leaving only a pair from that family. I excluded another 18 because at least one sibling of a pair was not in the wave 1 in-home sample. Almost 18% (or 424) of the sibling pairs were excluded because they did not have parents who completed the parent questionnaire. From the remaining 1,920 sibling pairs, I dropped 249[2] because they had conflicting reports about the total number of siblings in their households. Because families with more than one sibling are more likely to have more than one sibling type (complex families), the final restriction eliminated 1,060 pairs that came from

[2] These cases represent another dimension of family boundary ambiguity (see White, 1998), therefore excluding the cases potentially downwardly biases estimates of family boundary ambiguity.

families with more than one sibling (Table 6). This made it easier to determine concordance in sibling pairs.

Most of the parents that filled out the in-home parent questionnaire are the biological mothers of adolescents. If a mother was not available, interviewers interviewed stepmothers, fathers, stepfathers or male guardians, in that order, who lived with the adolescent. Parents provided information on each sibling in the household including their genetic relationship to each child. This information can also be used to count the number of parents who had multiple adolescents in the sample but not to identify which specific parent had more than one study adolescent in their household. I solve this problem by merging the genetic oversample with wave 1. The merged file contains sibling pairs and their parents who completed the parent's questionnaire. I identify each family unit (parent with two adolescents in the household) by using the family and adolescent identification numbers.

Table 6: Analytic Sample 1

Sample Size Restrictions and Changes	Pairs	Respondents
No Restrictions	3,139	6,278
Removal of duplicates	2,633	5,266
Sibling type restricted to full, half-, and stepsiblings	2,344	4,688
Removal of cases that are in the sibling oversample but not in wave 1	2,326	4,562
Removal of respondents with more than one sibling	2,308	4,616
Pairs with a parent that completed the parent questionnaire	1,920	3,840
Pairs that agreed on the total number of siblings in their household	1,671	3,342
Pairs that agreed that there is only one sibling in their household	611	1,222

Analytic Sample 2: To generate the weighted estimates and descriptive profile of the blended family, I use the household roster from the wave 1 in-home sample (N=20,745) to develop the family structure measure. To do this, I first create a measure that identifies the number and type of parents in the households. I exclude adolescents who do not report any parents in their household or have more than two resident parents. I then create another measure

that counts the number and type of siblings (full, half- and stepsiblings). I further restrict the sample to respondents that have only one sibling in their household because the reports of sibling relationship quality decline acutely for higher order siblings (see chapter 6). I combine both measures to produce the family structure measure (Table 7).

Table 7: Analytic Sample 2

Sample Size Restrictions and Changes	Respondents
No Restrictions	20,745
Removal of cases that either had no parents or more than two parents	20,714
Restricted to respondents with one sibling	7,688

Source: Add Health Waves 1, 3, and 4.

Analytic Sample 3: To examine sibling relationships and first union formation, data from wave 1 was combined with the genetic oversample (N =3,139). I use the oversample to maximize the number of half-sibling and stepsibling pairs needed to perform the ordered logit and Cox regression analyses. I create a second family structure measure by combining the measure that identifies the number and type of parents in the households (the wave 1 household roster) with the sibling types (full, half- and stepsiblings) identified in the genetic oversample. The sibling type measure was one of four provided by Add Health. I use this variable to restrict the oversample to full, half- and stepsibling pairs (Table 8). I then reshape the format of oversample data from wide to long so that the unit of analysis is an individual instead of a pair of individuals. The reshaping process produces duplicate cases (a respondent occurring more than once is the data set) that are deleted from the data set. A further 650 cases are dropped from the sample after I merged the oversample to the wave 1 sample, because they are not in the wave 1 sample or had more than one sibling. To address any issues about the representativeness of analytic sample 3, I include a detailed comparison of the distribution of the family structure

measures from analytic sample 2 and 3 in chapter 6. Additionally, I use analytic sample 2 to replicate the multivariate analyses conducted on analytic sample 3.

Table 8: Analytic Sample 3

Sample Size Restrictions and Changes	Pairs	Respondents
No Restrictions	3,139	6,278
Removal of duplicates	2,633	5,266
Sibling type restricted to full, half-, and stepsiblings	2,344	4,688
Removal of cases that are in the sibling oversample but not in wave 1	2,326	4,562
Removal of respondents with more than one sibling	2,308	4,616

Source: Add Health Wave 1, 3, 4, and the PAIRS data.

For the analyses of sibling relationship quality, I further restrict analytic sample 3 to respondents who had information about their sibling dyads, and answered questions about the level of affection, conflict, and unequal treatment they experienced. This restriction reduced the sample size from 4,616 to 3,481 cases. The event history analysis is done in two stages. For the first stage of the event history analyses, I restrict the sample to individuals who have information on union formation at wave 4, which excludes 1,127 cases. I also exclude 158 individuals who form first unions prior to age 16. Eighty-six of these respondents are older than age 16 at wave 1 and therefore part of their observation period is left truncated. Respondents who form early first unions are very different from respondents who do so after age 16 (Guo, 1993). The sample size for the first event history analyses is 3,331. The use of sibling relationship measures at the second stage of event history analysis excludes 572 cases. The final sample size is therefore 2,579.

Measures

Independent Variables

***Family Structure**:* I use two family structure measures in the analyses. I construct each measure in three stages. First, I create a variable that uses the wave 1 household roster to count and identify the number and type of parents in each household. Second, I use the household roster to develop a matching variable for siblings in each household. I also modify an existing variable from the genetic oversample that counts and identifies the number and types of siblings in each family. Please note that the genetic oversample sibling types are identical to the types derived from the household roster. However, Add Health does not provide documentation that details the creation of its sibling type measures. Third, I combine the variables from stage one and two to match parents with their children. The family structure measure that is used to generate nationally representative estimates is a combination of the two variables created from the household roster. In other words, I use only wave 1 for this measure to ensure that the sample can be corrected for design effects. The second family structure measure combines the types of parents identified in the household roster (wave 1) and the sibling type for each pair from the oversample. The use of the oversample is beneficial in three ways: (1) it increases the number of half-sibling and stepsibling pairs that are underrepresented in the in-home sample; (2) it increases the chances that half- and stepsibling pairs have reports of sibling relationship quality; and (3) it makes pairwise comparisons of family structure possible in order to assess the effects of family boundary ambiguity.

Information for parent type was only available from the household roster. Adolescents could identify five types of parents in their households: two biological parents; married biological mother/father and stepfather/stepmother parents; cohabiting biological mother/father

and stepfather/stepmother parents; single mother; and single father. Adolescents could have three types of siblings: full siblings (FS), half-siblings (HS), and stepsiblings (SS). Adolescents who had more than one sibling in their household could also have more than one type of sibling. For example, some adolescents had full and half-siblings; full and stepsiblings; half- and stepsiblings; and full, half- and stepsiblings. The combination of both variables produces the family structure categories that I describe in the following paragraph.

Family structure consists of six family types (and a residual other category), all of which include two children residing in the same household. **Two biological parent families** include two married biological parents that reside in the same household, the focal child, and his/her full sibling at wave 1. **Remarried** and **cohabiting stepfamilies** are families with either a stepfather or stepmother and a biological parent with two children (from previous unions) of one or both partners residing in the household (Stewart, 2007). **Remarried** and **cohabiting blended families** have two parents and a pair of half-siblings (Halpern-Meekin & Tach, 2008; Evenhouse & Reilly, 2004; Gennetian, 2004; Ginther & Pollak, 2004). One half-sibling is the biological child of both parents and the other is the biological child of one parent but a stepchild to the other parent. A **single-mother family** includes households where there is one parent and her children and no other adults. The **other family** category consists of families with two children and either no parents, or multiple stepparents, or same-sex parents. As described in the previous section, I construct family type by identifying the parent relationships, marital status and sibling relationships for the focal child and their parent. Please note that for the multivariate analyses, to ameliorate problems with small cell sizes, I combine cohabiting and married families into a single category. I model parents' cohabitation using a dummy variable to indicate a cohabiting family.

Mother-child Relationship Quality*:* Mother-child relationship quality is the perceived emotional ties that the child and mother feel towards each other. It includes satisfaction, love, emotional support and consistent parenting (Evenhouse & Reilly, 2004). Similar to the approach used by Halpern-Meekin and Tach (2008), I use seven items (wave 1) from the perspective of the adolescent to measure this construct. These items assess how adolescents feel about their mothers. The items consist of the following questions or statements. *"How close do you feel to your mother/father?"; "How much do you think he/she cares about you?"; "Your mother/father encourages you to be independent."; "Most of the time, your mother/father is warm and loving toward you."; When you do something wrong that is important, your mother/father talks about it with you and helps you understand why it is wrong."; "You are satisfied with the way your mother/father and you communicate with each other."*; and *"Overall, you are satisfied with your relationship with your mother"*. The items had answer categories that consisted of 1=not at all, 2=very little, 3=somewhat, 4=quite a bit and 5 =very much or 1= strongly disagree to 5 =strongly agree. I create a summated scale (reliability α =0.84). Because most respondents indicate positive relationships with their mothers, I recode the scale into three dummy variables that indicated below average, average (reference category), and above average mother-child relationships.

Parental Preferential Treatment*:* Parental preferential treatment refers to the perceived level of unequal treatment received by siblings. I use one item (from wave 1), "*Think of all the things your parents do for you and {NAME}. Do you think that you or {NAME} receive more attention and love from your parents*? *Would you say {NAME} receives...?"* with a five-value answer category (1=a lot more, 2=a little more, 3=the same amount, 4=a little less and 5=a lot less) to measure parental preferential treatment. Parental preferential treatment in and of itself is

not problematic if it is considered to be fair by both parents and siblings (McHale et al., 2007; McHale et al., 2005; Kowal et al., 2004). However, because the item specifically assesses love as well as attention, I assume that if there is preferential treatment, the respondent considered it to be unfair as well. This assumption is reasonable since preferential treatment that results from differences in needs, characteristics, abilities and roles are more likely to be seen as fair than differences in how much each child is loved (Kowal et al., 2004). In keeping with Suitor's (2009) coding method, I distinguish three groups: sibling treated better, respondent treated better, and equal treatment (reference group). A respondent is treated better if they indicate 1 or 2, else was zero. If they indicate 4 or 5, their sibling is treated better. There is equal treatment if they said they were treated the same.

Dependent Variables

Sibling Relationship Quality*:* Sibling relationship quality is the perceived level of love, warmth, and conflict that siblings experience (Yu & Gamble, 2008; McHale et al., 2007; Updegraff et al., 2005). I use two items at waves 1 to tap two dimensions of sibling relationship quality. I measure sibling affection using an item that asks, "*How often do you feel love for*". Sibling conflict is measured by an item that asks "*How often do you and… quarrel or fight*". Both items have answer categories that range in value from 1=very often, 2=often, 3=sometimes, 4 = seldom and 5 = never. Factor and reliability analysis indicates that these items are best used as separate measures of each dimensions rather than as a scale. Consequently, I model the love and conflict aspects of sibling relationship quality separately. I recode each variable so that higher values indicate more affection or conflict for each respondent.

While the two items chosen as measures of sibling relationship quality are more than satisfactory, only a little over 5,000 adolescents responded to these items. Interviewers were

required to ask the respondents about their relationship quality if they had siblings in the household who were also in the study. Unfortunately, they did not consistently ask respondents these items when applicable and if they did, they did not ask about all of the respondent's siblings that lived in the household. For those that they did ask, there is no way of identifying which sibling relationship they were describing. The problem of specificity is only an acute concern when there is more than one sibling in the household. I discuss the impact that this has on using the sibling-relationship quality measures in chapter 6.

Timing to First Union Formation*:* Timing of first co-residential union measures the time (age) in months from the baseline (age 16), to when a respondent fails to form a first union by the end of the observation period (right censored by their interview at wave 4), or form a first union by cohabitation, and/ or form one by marriage. For respondents whose exposure intervals are left truncated, i.e. they were older than age 16 at wave 1, their risk interval starts at the date at first interview. For example, the risk period for respondents aged 17 at wave 1 begins at the date they are first interviewed. The time to first union formation is measured by comparing the month and year of the formation of the first co-residential union (cohabitation or marriage), or the date of interview (for those right censored), to each respondent's date of birth. Individuals that form a first union by cohabitation are coded 1, and those who did so by marriage are coded 2. Those who did not form a first union by the time of the interview are coded 0. The timing to first union formation utilizes relationship histories for waves 3 and 4. This maximizes the number of cases available for the analysis by substituting wave 3 data for histories missing at wave 4.

Control Variables

The following controls are used in the analyses. **Demographic** controls include respondent's age at wave 1, and dummy variables for respondent's race/ethnicity (white, African

American, Hispanic and other races) and gender. **Economic resources** are measured using family socio-economic status (SES) which is an index variable that combines parent's educational and occupational attainment (Bearman & Moody, 2004). **Parental resources/socialization** are measures of the number of activities with parents, parental preferential treatment, and mother-child relationship quality. **Controls for sibling dyad** consists of dummy variables for birth order of respondent (older and younger) and sibling gender composition.

Analytical Plan

In chapter 6, I use analytic sample 1 to assess the prevalence of family boundary ambiguity and family structure misclassification in the reports of the genetic relationship between sibling pairs and the female parent in their household using simple cross-tabulations. I also examine the extent to which sample weight information was available for siblings in the oversample and the availability of sibling reports of relationship quality for each sibling in a pair, using frequencies and cross-tabulations.

In chapter 7, I use analytic sample 2 and the STATA survey estimation procedures to generate weighted means and proportions to develop the descriptive profile of blended families. I construct the descriptive profile by making comparisons across family structures using social and demographic characteristics of the sample. For instance, I compare the socioeconomic characteristics (e.g. family SES), family processes (mother-child and sibling relationship quality), and first co-residential union at wave 4 of blended families to the other family types.

I use analytic sample 3 to run ordered logit regressions (OLR in STATA) that assess if the quality of sibling relationships (wave 1) in blended families differ from those in other family

Table 9: Analytical Plan

Hypotheses	**Statistical methods**
1) Sibling affection will not vary across family structure.	Ordered logit regression: **Model 1**: Affection = family structure dummies **Model 2**: Affection = family structure dummies + cohabitation **Model 3**: Affection = family structure dummies + cohabitation + (Controls) socio-demographic variables **Model 4**: Affection = family structure dummies + cohabitation + (Controls) socio-demographic variables + sibling dyad measures **Model 5**: Affection = family structure dummies + cohabitation + (Controls) socio-demographic variables and sibling dyad measures + mother-child relationship + parental preferential treatment
2) Sibling relationships will be less negative in blended families than in families with full siblings (two biological parent, step-, and single parent families), but more negative than in stepfamilies with stepsiblings. 3) Sibling relationship quality in married families will be less negative than that in cohabiting families.	Ordered logit regression: **Model 1**: Conflict = family structure dummies **Model 2**: Conflict = family structure dummies + cohabitation **Model 3**: Conflict = family structure dummies + cohabitation + (Controls) socio-demographic variables **Model 4**: Conflict = family structure dummies + cohabitation + (Controls) socio-demographic variables + sibling dyad measures **Model 5**: Conflict = family structure dummies + cohabitation + (Controls) socio-demographic variables and sibling dyad measures + mother-child relationship + parental preferential treatment
4) Adults from blended families and those from other non-two biological parent families will form unions at earlier ages than those from two biological parent families.	Cox regression: **Model 1**: Age of first union formation = family structure dummies **Model 2**: Age of first union formation = family structure dummies + (Controls) socio-demographic variables
5) Compared to individuals from two biological parent families, individuals from cohabiting blended, cohabiting step-, and single-mother families will have a greater risk of forming their first union through cohabitation and lower risk of forming one through marriage. 6) Adults from married step- and blended families will have a higher risk of forming both types of unions than their counterparts from two biological parent families.	Cox regression – competing risk: **Model 1**: Type of first union formation = family structure dummies **Model 2**: Type of first union formation = family structure dummies + cohabitation **Model 3**: Type of first union formation = family structure dummies + (Controls) socio-demographic variables
7) Siblings with lower quality relationships will form first co-residential unions at younger ages.	Cox regression: **Model 1**: Age of first union formation = family structure dummies **Model 2**: Age of first union formation = family structure dummies + cohabitation **Model 3**: Age of first union formation = family structure dummies + cohabitation + socio-demographic variables **Model 4**: Age of first union formation = family structure dummies + cohabitation + socio-demographic variables + Parental resources/socialization + mother-child relationship **Model 5**: Age of first union formation = family structure dummies + cohabitation + socio-demographic variables + Parental resources/socialization + mother-child relationship + parental preferential treatment + conflict + affection
8) Individuals who have lower quality sibling relationships will have higher rates of cohabitation and lower rates of marriage.	Cox regression – competing risk: **Model 1**: Type of first union formation = family structure dummies **Model 2**: Type of first union formation = family structure dummies + cohabitation **Model 3**: Type of first union formation = family structure dummies + cohabitation + socio-demographic variables **Model 4**: Type of first union formation = family structure dummies + cohabitation + socio-demographic variables + Parental resources/socialization + mother-child relationship **Model 5**: Type of first union formation = family structure dummies + cohabitation + socio-demographic variables + Parental resources/socialization + mother-child relationship + parental preferential treatment + conflict + affection

structures (wave 1). As mentioned earlier, sibling relationship quality has two dimensions, one that taps the amount of affection and the other, the level of conflict between sibling pairs. I choose OLR because both outcome variables were ordinal[3]. Table 9 details the hypotheses and the variables that I include in each model.

In chapter 8, I investigate, using analytic sample 3, how growing up in a blended family is associated with first union formation behavior in adulthood (Table 9). I use Cox proportional hazards models (partial likelihood estimation in SAS, using PROC PHREG) for these analyses. All models assume timing starts at age 16 (or age at first interview if left truncated) and continues until respondents form a first union, or are right censored if they fail to do so by their interview at wave 4. The first set of models examine the effect of family structure (measured at wave 1) on the risk of forming a first co-residential union. The dependent variable in this analysis is the age (in months) at which a first co-residential union (either cohabitation or marriage) occurs. The second set of models, assess the effect of family structure on the type of first union formed. In these models, cohabitation and marriage are competing risks. In the cohabitation models, the dependent variable is age (in months) at which cohabitation occurs. In the marriage models, the dependent variable is age (in months) at which marriage occurs. I repeat the analysis to assess whether sibling relationship quality appears[4] to mediate the relationship between family structure and first co-residential union formation.

[3] Tests of the proportional odds assumption indicate that it is not valid. However, alternative models that correct for non-proportional odds do not significantly change the interpretation of the results.
[4] I did not conduct a formal test of mediation.

CHAPTER VI: ASSESSMENTS OF FAMILY BOUNDARY AMBIGUITY, THE ADEQUACY OF SIBLING RELATIONSHIP MEASURES, AND THE REPRESENTATIVENESS OF THE GENETIC OVERSAMPLE

In this chapter, I use cross-tabulations to (1) explore the difficulties family boundary ambiguity (the discrepancies in the reports of family members) presents to the measurement of complex family structures; (2) assess the extent to which the errors made by Add Health during data collection affect the utility of sibling relationship quality measures; and (3) assess the representativeness of analytic sample 3 and the implications of using the genetic oversample on the current analysis. I use data from analytic sample 1 to assess family boundary ambiguity and analytic sample 3 for the other assessments.

In the assessment of family boundary ambiguity, cross-tabulations show the discrepancies in family structure reports by comparing reports of a pair of siblings or mother-adolescent pairs from the same family. These pairwise analyses check for: (1) consistency between sibling reports about genetic relatedness, type of parent they live with, and family structure, and (2) consistency of parent-child pairs about genetic relatedness (i.e. biological mother, stepmother or no mother). Reports are ambiguous if siblings disagree on the genetic relationship with their sibling or mother, the type of parents they live with or the family structure they live in. For example, a report is ambiguous if one sibling identified that he or she is a half-sibling and the other sibling said otherwise. I report the findings from the perspective of the "sibling 1" which is an arbitrary designation.

I assess the availability of sibling relationship quality reports by comparing the total number of siblings in each respondent's household to the number of siblings who made reports. I assess the representativeness of the sibling oversample by determining how the availability of weight information and socio-demographic characteristics vary across sibling types.

Results

Sibling Relatedness and Family Structure Concordance

Sibling Concordance on Genetic Relatedness*:* Table 10 shows the level of agreement between sibling pair reports about their genetic relatedness to each other. The vast majority of siblings agree with each other about their genetic relationship. Only 2.1% of sibling pairs had conflicting reports of their genetic relatedness. The level of incongruence varies by sibling pair type. Less than 1% of full sibling pairs had discrepant reports, compared to 6.5% for half-sibling pairs and 7.1% for stepsibling pairs. The pattern of incongruence suggests that family boundary ambiguity is greater for half- and stepsiblings.

Table 10: Boundary Ambiguity in Sibling Reports of Sibling Type (%)

Sibling 1	No Ambiguity	Ambiguity*
Full Siblings	99.2	0.8
Half-siblings	93.5	6.5
Stepsiblings	92.9	7.1
Overall	97.9	2.1

N = 611 sibling pairs
The measure of sibling genetic relatedness used here was derived from the household roster. The measure from the PAIRS data set was not used because Add Health determined the classification of each pair so there were no discordant pairs.
* Ambiguity in sibling type results when a sibling pair differ in their report of their genetic relatedness.

Sibling Concordance on Parents Present in their Households*:* Table 11 shows the degree of congruence in the reports made by sibling pairs about the type of parents in their households. The percentages are from the perspective of sibling 1. Siblings identified four parent types: two biological parents, single mother, single father and residual. Ambiguity occurs if siblings disagree on the type of parents they live with. Note that reports from half-siblings in the same blended family should legitimately be discordant but I do not distinguish them from

other discrepant reports[5]. Like reports of sibling relatedness, most sibling pairs (97.1%) are concordant

Table 11: Boundary Ambiguity in Sibling Reports of Parent Type (%)

Sibling 1	No Ambiguity	Ambiguity†
Two biological parents	98.5	1.5
Single mother	94.5	5.5
Single father	100	0
Residual*	91.7	8.3
Overall	97.1	2.8

N = 611 sibling pairs

*The residual parent type consists of no parents, single stepparent, two stepparents in a household, two biological parents and a stepparent in a household, and two stepparents and a biological parent in a household.

† Ambiguity in parent type results when a sibling pair differ in their report of the type of parent(s) they have in their household.

with the type of parents whom they lived. Almost 2.8% of sibling pairs disagreed about what type of parents with whom they lived. Siblings with single mothers and residual parent type have the highest levels of ambiguity. Among discordant pairs, siblings disagreed with each other because one sibling was more likely to report only one parent or no parents.

Concordance of Sibling Reports of Parents in the Household and Parent Reports of Genetic Relatedness to Children in the Household*:* Fourteen percent of parents who completed the parent questionnaire have twins and other children in the survey. Most of these parents (95%) who have two children in the sibling oversample describe their genetic relatedness to both siblings. Table 12 shows the reports of genetic relatedness between parent and child made by parents (with multiple children in the survey) and one of their adolescent children. Overall 4.5% of the parent and adolescent reports are incongruent and therefore indicative of family boundary ambiguity. Almost all pairs of parents and children agree that they are biological mothers

[5] While this may bias estimates of discrepant half-sibling reports upwards, it is offset by discrepant reports made by half-siblings about the type of parents they live with and their parent's marital status. Therefore the overall estimate of family boundary ambiguity is not acutely affected.

(98.2%). There are no discrepant reports given by stepmothers and stepchildren pairs. Congruence was the lowest (63.3%) for parent-child pairs where the parent was not a mother (i.e. biological or stepmothers). Most incongruent reports are between parent-child pairs who disagree that the parent was the adolescent's mother.

Table 12: Boundary Ambiguity in Adolescent and Mother Reports of Relationship to Siblings (%)

Sibling 1	Mother	Stepmother	No Mother
Mother	98.2	0	26.7
Stepmother	0	100	10
No Mother	1.8	0	63.3
Overall	86.4	4	5.1
Sibling 2	Mother	Stepmother	No Mother
Mother	98.5	0	32.1
Stepmother	0	90.9	10.7
No Mother	1.5	9.1	57.4
Overall	88.1	2.7	4.3

N = 611 sibling pairs
Ambiguity in adolescent and mother reports of relationship to siblings results when an adolescent and mother pair differ in their report of their genetic relatedness.

Concordance of Sibling Reports of Family Structure*:* There is a high degree of concordance between sibling pair reports of family structure. Roughly, 94% of sibling pairs are concordant in their reports of family structure. In Table 13 the diagonal number in bold are percentages of concordant reports. The six percent of sibling pairs that are discordant disagreed about their parent's marital status, parent-child genetic relatedness, and/ or the number of parents present in their households. The overall pattern suggests that discordant reports were higher in complex families. Sibling pairs from married and cohabiting step- and blended families have more discrepancies in their reports on family structure than pairs from two parent biological families.

Table 13: Boundary Ambiguity in Sibling Reports of Family Structure (%)

				Sibling 2			
Sibling 1	Two biological parents	Married stepfamily	Married blended family	Cohabiting stepfamily	Cohabiting Blended family	Single parent family	residual
Two biological parents family	**98**	3.7				2	
Married stepfamily	0.7	**90.7**		21.4		2	
Married blended family			**91.4**		28.6	1.4	4.2
Cohabiting stepfamily		1.9		**64.3**			
Cohabiting Blended family					**42.9**	2.7	
Single parent family	1	1.2	5.7	14.3	28.6	**91.9**	4.2
Residual	0.3	1.9	2.9				**91.7**
Total	301(100)	54 (100)	35 (100)	14 (100)	7 (100)	148 (100)	24 (100)

N = 611 sibling pairs

Ambiguity in sibling reports of family structure results when a sibling pair differ in their report of the type of household in which they live.

What does Family Boundary Ambiguity Really Mean for Measuring Family Structure?

The preceding analysis shows that there is a positive association between family boundary ambiguity and family complexity (Brown & Manning, 2009; White, 1998; Cherlin, 1978). Family boundary ambiguity can affect all relationships within a family and in the most complex families; it does so at every level. At the sibling level, half- and stepsiblings are more likely than full sibling pairs to have discordant reports. At the parent-child level, sibling pairs with step- and single parents have more disagreements about their parent type configuration (i.e. the number and type of parents in the household) than those with two biological parents. Sibling pairs that disagree about their genetic relationship are also more likely to have discrepant reports on parent type. At the parents' relationship level, sibling pairs with cohabiting parents have more discordant reports than those with married parents. Cohabiting blended families seem particularly confusing for siblings. This may indicate that they are less institutionalized than

married blended families. Cohabiting relationships are possibly more unstable than marriage relationships are because they are not regulated by a legally binding and culturally ratified contract (Brown & Manning, 2009).

The family structure measure used in the analysis is reliable. While it is clear that there is ambiguity, the overall level of concordance is 93.7%. Concordant sibling reports of family structure are better than individual reports of family structure because multiple reports are more likely to capture the actual family structure. In this instance, multiple reports improve the classification of respondents into family types because we know which respondents are siblings from the same family in the survey. This improvement in classification is particularly important for blended families where siblings in the same family experience different parent environments.

Despite the improvements in family structure measurement that multiple reports facilitate, misclassifying respondents is still possible because it depends on whose report is used (Brown & Manning, 2009). In Table 14, I illustrate the ways in which this can occur using five sibling pairs with discordant reports of family structure. Siblings from the same household can be misclassified into different family structures if they disagree about the presence of two parents in the household or disagree about the marital status of parents in the household. In the former, one sibling fails to identify a stepparent in the household, and as a result, this sibling is classified in a single parent family while their sibling is classified in a two-parent family (pairs 1-3). Alternatively, a sibling may not identify any parent, so they would be in a residual family (pair 5). In the latter, both siblings acknowledge the presence of a stepparent but one identifies their parents' relationship as a marriage and the other as cohabitation (pair 4). The implication for complex families is that they are underestimated. It is also clear, that while identifying a half-

sibling relationship does minimize misclassification as either two biological or stepfamilies, it does not address the problems of family boundary ambiguity.

Table 14: Exploring the Patterns of Family Boundary Ambiguity in Sibling Pair Family Structure Reports

Pair	Family structure		Parent type		Sibling type	
	Sibling 1	Sibling 2	Sibling 1	Sibling 2	Sibling 1	Sibling 2
1	Single parent family	Cohabiting Blended family	Single mother	Cohabiting stepfather	HS	HS
2	Two biological parents family	Single parent family	Two biological	Single mother	FS	FS
3	Married stepfamily	Single parent family	Married stepfather	Single mother	FS	FS
4	Married blended family	Cohabiting Blended family	Two biological	Cohabiting stepfather	HS	HS
5	Residual	Married blended family	Residual	Married stepfather	HS	HS

The ideal solution to the problem of family boundary ambiguity is to use reports of family structure from interviewers. Inconsistent reports about family structure could then be reconciled by using the interview reports. In the absence of such reports, the best alternative is the approach developed by Brown and Manning (2009). They include a variable that controls for family boundary ambiguity in their regression models. I employ a variation of the first strategy by using the Add Health classification of sibling type to determine family structure. Specifically, I reconcile discrepant reports between siblings by using the Add Health classification. The assumption is that the method used by Add Health in the genetic sample is more accurate than adolescent reports from the household roster. The major disadvantage of this approach is that it can only be used for siblings in both the genetic oversample and the wave 1 in-home sample.

Siblings and the Availability of Sibling Relationship Quality Reports

As discussed in chapter 5, I assess the impact of interviewer errors on the availability of sibling relationship quality measures. I use only affection in the analysis because the

distributions of the affection and conflict measures are similar. For this part of the analysis, I restrict the sample to families with a pair of siblings who were in wave 1 and were either full, half- or stepsiblings.

Table 15: The Proportions of Siblings with Reports of Affection (%)

Total number of siblings in respondent's household	Number of siblings for which respondents made reports about affection				
	0	1	2	3	4 or more
No Siblings	90	7.3	2	0.7	0
One Sibling	16	82.9	1	0.2	0
Two Siblings	13.3	72.6	13.6	0.4	0.1
Three Siblings	15.5	63.5	17.6	3.4	0
Four Siblings	15.6	52.1	23.6	7.2	1.5
Five Siblings	18.7	51.4	19.6	8.4	1.9
Six Siblings	12.7	66.7	11.1	4.8	4.76
Seven Siblings	30	50	3.3	6.7	10

N = 4,616

Table 15 shows the distribution of the number of siblings who live with respondents and the number of siblings for which respondents report their affection. A little over 82% of respondents who have one sibling report on their relationship quality with that sibling. As the number of siblings increases, the reports of affection decrease. About 14% of respondents with two siblings report on both and less than 4% with three siblings report on all three of their siblings. Almost a fifth of respondents who have siblings give no reports of affection. Most of the respondents that give reports about a sibling are full siblings (results not shown). Most of the half- and stepsibling pairs that have sibling relationship quality information, do not have for both siblings. This makes pairwise analyses of sibling relationship quality untenable.

Representativeness of Analytic Sample 3

As pointed out in chapter 5, most of the half- and unrelated siblings are not in the probability sample. The core in-home or probability sample of Add Health consists of 12,105

respondents. Each of these cases should have weights that correct for design effects and make the sample nationally representative of U.S. adolescents in grades 7 – 12. Harris et al., (2012) argue that the oversample is nationally representative because they select the sibling pairs from the in-school survey that uses a nationally representative sampling frame. Contrary to this claim, Chantala (2001) finds that approximately 36% of the sibling pairs in the oversample do not have weight information that includes the region of the country, the school identifier, and the grand sample weight for respondents at wave 1. The majority of unrelated sibling pairs (77.2%) and a considerable proportion half-sibling pairs (39.6%) lack weight information. I assess the extent to which the lack of weight information affects my sample by finding the proportion of each sibling type for which weight information is available.

I restrict the oversample to families with a pair of siblings that are in both the oversample and wave 1 and are either full, half- or stepsiblings, which produces a sample of 4,616 respondents or 2,308 pairs of siblings (see Table 8). Of the 2,308 pairs, 1,656 had weights, 2,050 had information on region and 2,308 had information on the school identifier. Roughly, 28% of all sibling pairs do not have any weight information. Most of the 1,656 with weights are full siblings (904 non-twins and 518 twins), 211 are half-sibling pairs, and 15 were stepsibling pairs. Approximately 72% of full sibling and 66% of twins have weights. Only 10% of stepsibling and 48% of half-sibling pairs have weights.

The results from my assessment do not support the argument made by Harris et al. (2012). The results are more similar to those in Chantala's 2001 and 1999 reports, both of which show that a large proportion of the sibling oversample is from schools that are not part of the nationally representative sampling frame. About 36% of the siblings in the oversample have no weights to correct for design effects. Half-siblings and unrelated pairs constitute large portions of

the proportion without weights. It is not possible to compute weights for these pairs. The only way to get some idea of the representativeness of the oversample is to compare its socio-demographic characteristics to that of the probability sample.

Table 16 shows the differences in key demographic variables between the oversample and respondents with one sibling from wave 1. Both samples are very similar to each other in gender, race and age distributions but differ notably on socioeconomic status (SES). Individuals from the sibling oversample have lower family incomes than those from the full sample. An examination of these characteristics by sibling type reveals the same pattern, except that there is considerable variation in the standard deviation of age. While variations by sibling type may be small, there may be differences in family structure distribution.

Table 16: Comparison of Key Socio-demographic Characteristics of the Genetic Oversample and Wave 1 Samples

Socio-demographic Characteristics		**All Siblings**		**Full Siblings**		**Half-Siblings**		**Stepsiblings**	
		PAIRS	Wave 1	PAIRS	Wave 1	PAIRS	Wave 1	PAIRS	Wave 1
Gender	Male	50.31	49.53	50.78	49.87	48.59	46.83	50.96	51.49
	Female	49.69	50.47	49.22	50.13	51.41	53.17	49.04	48.51
	n	4,250	7,718	3,261	6,649	638	931	208	101
Race	White	58.06	58.07	58.41	59.26	48.75	49.62	76.92	69.31
	Black	19.73	19.8	17.59	18.44	34.48	29.22	12.98	18.81
	Hispanic	14.55	13.83	15.41	13.43	13.01	16.54	7.69	8.91
	other	7.65	8.29	8.59	8.86	3.76	4.62	2.4	2.97
	n	4,247	7,716	3,258	6,647	638	931	208	101
Age	Range	9.67	9.83	9.67	9.67	8.33	8.67	7.67	8.08
	Mean	16.07	16.09	16.14	16.09	15.86	16.06	15.72	16.32
	S	1.69	1.71	1.64	1.7	1.88	1.76	1.78	1.76
	n	4,247	7,716	3,259	6,647	638	931	207	101
SES	Range	9	9	9	9	9	9	9	9
	Mean	5.54	5.81	5.69	5.94	4.47	4.88	5.71	5.66
	S	2.64	2.63	2.62	2.62	2.38	2.49	2.53	2.62
	n	4,250	7,718	3,261	6,649	638	931	208	101
N		4,288	*7,718	3,261	6,649	638	931	208	101

*N = 7,718 are the number of respondents in wave 1 with one sibling in their household.

Generally, the oversample has larger proportions of each type of family, with marked differences in the distribution of some family types. Table 17 compares the distributions of family structure for the full wave 1 sample, the wave 1 sample restricted to household with two children, and the genetic oversample. All three measures exhibit a similar distribution pattern, with notable differences in the proportions of two biological parent families, married stepfamilies and single parent families. These differences are probably the result of discrepancies in sibling type identification between the oversample and the wave 1 household roster, as well as the overrepresentation of half and stepsiblings in the oversample.

Table 17: Weighted Family Structure Distribution at Wave 1 and Unweighted Family Structure Distribution for the Genetic Oversample (%)

Family type	Weighted		Unweighted		
	Full sample	Two children	Full sample	Two children	PAIRS
Two biological parents family	44.2	58.7	42.9	56.3	48
Married stepfamily	5.2	6.9	5.4	7.1	12.1
Married blended family	7	5.8	7.5	6	8
Cohabiting stepfamily	1.1	1.8	1.1	1.7	2
Cohabiting Blended family	0.7	0.8	0.8	0.8	1.2
Single parent family	16.3	22.7	18.1	24	24.3
Two biological parents family with one child	8.3	NA	7.2	NA	NA
Married stepfamily with one child	2.69	NA	2.3	NA	NA
Cohabiting stepfamily with one child	0.8	NA	0.6	NA	NA
Single parent family with one child	7	NA	6.6	NA	NA
Residual	6.7	3.19	7.6	4.1	4.5
N	20,714	7,688	20,714	7,688	4,509

Implications of Using the Genetic Oversample in the Current Study

Three issues should be considered moving forward. First, the family structure measure that uses the oversample improves on the current way of measuring blended families by removing subjective assessment of the half-sibling relationship. However, family boundary ambiguity is still a problem because reports of parent type are subjective. Second, the majority of

siblings in the oversample have relationship quality reports but most of these reports are for full siblings. Additionally, in multiple sibling families, respondents do not report on (or were not asked about) all siblings and there is no way of knowing exactly which report corresponds to each sibling. Finally, the oversample has similar socio-demographic characteristics as the probability sample, but has higher proportions of non-biological two parent families because there are more step- and half-sibling pairs.

There are two ways to tackle the problems associated with sibling relationship quality. One way is to limit the sample to respondents who reported that they had one sibling and reported sibling relationship quality for one sibling. Another way is to average sibling relationship reports across siblings. Neither is ideal, since the first reduces the sample size[6], the second introduces bias, and neither makes within-sibling analyses possible. However, a reduced sample size is better than potential bias; therefore, I restrict the analyses to families with two children and forgo within-sibling analyses. I cannot correct the oversample for design effects but I include the key socio-demographic variables as control variables in subsequent analyses (Winship & Radbill, 1994).

[6] This also introduces bias because the sample is restricted to families with only two children.

CHAPTER VII: FAMILY STRUCTURE AND SIBLING RELATIONSHIPS

In this chapter, I report the social and demographic characteristics of blended families, comparing and contrasting these families to two biological parent families and stepfamilies. The profile of blended families developed from this discussion provides insight into the ways in which blended families are distinct structures from other family structures, particularly other two parent families. I conclude this chapter with a discussion of the results of the ordered logit regression (OLR) models that examine the association between family structure and sibling relationship quality. I evaluate three hypotheses: (1) sibling affection will not vary across family structure; (2) sibling relationships in blended families are less negative than full sibling relationships in two biological, step- and single mother families but more negative than for stepsiblings in stepfamilies; and (3) sibling relationships in married families are less negative than those in cohabiting families.

The analyses utilize analytic samples 2 and 3. I use the weighted analytic sample 2 to develop the socio-demographic profile of blended families. I use analytic sample 3 for the second set of analyses on sibling relationship quality (measured at wave 1) because there are more step- and half siblings in the genetic oversample than in the wave 1 in-home sample. A significant proportion of the oversample does not have weight information so I do not correct for design effects. I replicate the same analyses using the weighted analytic sample 2 where possible (see Appendix 2).

Because of small cell sizes for cohabiting families, I modify the family structure variable for the OLR analysis. I do this by combining married and cohabiting families for blended and stepfamilies, and modelling parents' cohabitation with a dummy variable. In supplemental analyses I compared the results of both specifications of family structure and found no real differences with the exception that the second version showed stronger effects and clearer

relationship patterns. Note that the family structure variable used for the socio-demographic profile includes cohabiting step- and blended families.

Results

Estimate of Blended Families

Table 18 shows the weighted distribution of family structures with only two adolescent children in the household. The majority (59%) of adolescent pairs reside in two biological parent families. Over a fifth (22.7%) are in single mother families. Most of those not in either of these two groups are in married families. Approximately seven percent reside in married stepfamilies and roughly six percent in married blended families. Of the remaining families, almost two percent are in cohabiting stepfamilies, less than a percent are in cohabiting blended families, and a little over three percent are in other families. Thus blended families with two adolescent children in their household account for almost seven percent of all U.S. families. This is roughly half of the 13% predicted in chapter 4 but the figure is possibly lower because it does not include families with more than two adolescents.

Table 18: Nationally Representative Distribution of Family Structure for Households with Two Adolescent Children (N = 7,688)

Family structure at wave 1	Percent	N
Two biological parent families	58.8	4,326
Married stepfamilies	6.9	543
Married blended families	5.8	460
Cohabiting stepfamilies	1.8	134
Cohabiting blended families	0.8	64
Single mother families	22.7	1,848
Other families	3.2	313

Notes: The data is from Add Health Wave 1. Percentages are weighted. "Other families" include households with no parents, multiple stepparents, and same-sex parents.

Descriptive Profile

Table 19 shows the distribution of the independent variables used in the analysis organized by family structure. Two biological parent families have the highest SES, followed by married step- and blended families, respectively. Cohabiting and single mother families are in the lowest SES brackets. There are slightly more female than male respondents in blended and in single mother families. Most (78.8%) non-Hispanic whites reside in two biological parent families or married non-two biological parent families (76.5%)[7]. Non-Hispanic blacks are concentrated in single mother families (26.6%) and Hispanics in cohabiting stepfamilies (6%). The majority of respondents who reside in blended families are non-Hispanic whites who are in married blended families. The other blended families consist mostly of non-Hispanic blacks and other minorities. Respondents with the highest mean age are in single mother (15.94) and other families (16.67) at wave 1. Respondents in two biological parent families and married families have similar mean ages; those from cohabiting families have the lowest mean ages. Respondents from blended families are younger than those from two biological parent families are, but older than those from stepfamilies are.

During the observation period, only 15.4% of respondents do not form a first union by the date of the wave 4 interview. A cross-tabulation between variables denoting the number of cohabitations and marriages among all persons in the wave 4 sample reveals that roughly 16% do not form a first co-residential union. Of those who form a first union, 70.4% do so through cohabitation and 14.1% through marriage (results not shown). Most of those who do not form first unions (17.4%) or form first unions through marriage (16.3%) are in two biological parent

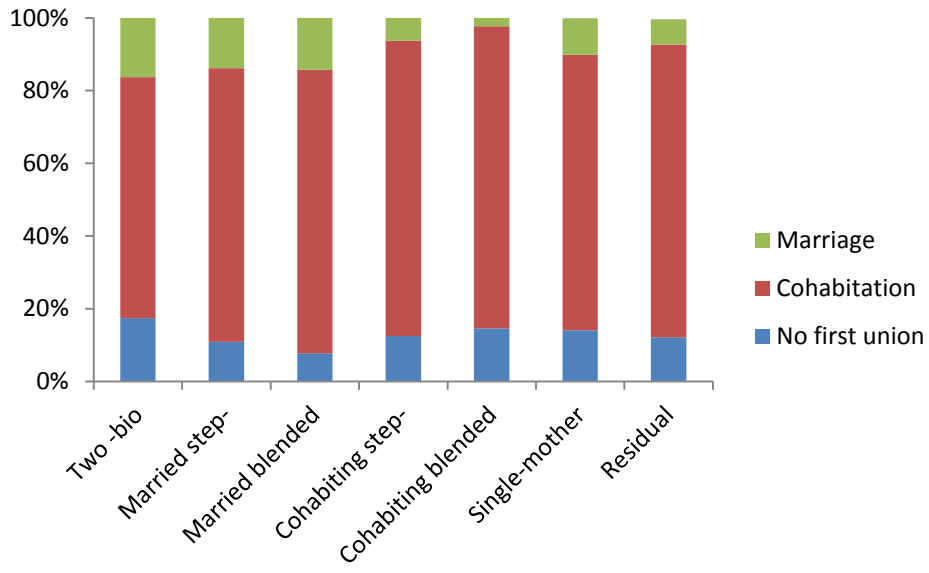
[7] The average proportion across married non-two biological parent families.

Table 19: Weighted Distribution of Means and Total Proportions of Selected Characteristics from Add Health Wave 1 by Family Structure (N =7,688)

	Family Type						
Variable	Two biological -parent family	Married stepfamily	Married blended family	Cohabiting stepfamily	Cohabiting blended family	Single-mother family	Other families
Mother's Characteristics							
Family socioeconomic status	6.290 (0.12)	5.541 (0.19)	5.183 (0.16)	4.752 (0.31)	4.201 (0.35)	4.827 (0.13)	4.257 (0.22)
Relationship Quality and Parental Investment							
Mother-child relationship							
Below average	0.306 (0.01)	0.367 (0.00)	0.344 (0.00)	0.390 (0.00)	0.500 (0.00)	0.323 (0.00)	0.317 (0.00)
Average	0.295 (0.01)	0.267 (0.00)	0.288 (0.00)	0.337 (0.00)	0.325 (0.00)	0.306 (0.01)	0.302 (0.00)
Above average	0.399 (0.01)	0.366 (0.00)	0.370 (0.00)	0.279 (0.00)	0.175 (0.00)	0.371 (0.01)	0.377 (0.00)
Parental preferential treatment							
Sibling treated better	0.208 (0.01)	0.213 (0.00)	0.205 (0.00)	0.305 (0.00)	0.566 (0.00)	0.278 (0.01)	0.320 (0.00)
Equal treatment	0.731 (0.02)	0.730 (0.01)	0.782 (0.01)	0.695 (0.01)	0.434 (0.00)	0.672 (0.01)	0.654 (0.01)
Respondent treated better	0.061 (0.01)	0.057 (0.00)	0.014 (0.00)	0.000 (0.00)	0.000 (0.00)	0.050 (0.00)	0.024 (0.00)
Number of mother-adolescent activities	3.963 (0.05)	3.864 (0.11)	3.904 (0.16)	3.796 (0.30)	4.064 (0.25)	4.183 (0.09)	3.602 (0.18)
Sibling affection	2.851 (0.05)	2.541 (0.13)	3.107 (0.13)	2.630 (0.15)	3.394 (0.21)	2.966 (0.07)	3.155 (0.22)
Sibling conflict	2.280 (0.05)	2.296 (0.11)	2.126 (0.16)	2.239 (0.15)	2.146 (0.39)	2.282 (0.08)	2.128 (0.29)
Respondent characteristics							
Female	0.488 (0.01)	0.470 (0.00)	0.539 (0.00)	0.404 (0.00)	0.538 (0.00)	0.504 (0.01)	0.473 (0.00)
Race/ethnicity							
Non-Hispanic white	0.788 (0.02)	0.769 (0.00)	0.760 (0.00)	0.705 (0.00)	0.575 (0.00)	0.590 (0.01)	0.304 (0.00)
Non-Hispanic black	0.076 (0.01)	0.128 (0.00)	0.120 (0.00)	0.131 (0.00)	0.188 (0.00)	0.266 (0.01)	0.502 (0.00)
Hispanic	0.038 (0.00)	0.025 (0.00)	0.048 (0.00)	0.060 (0.00)	0.041 (0.00)	0.047 (0.00)	0.050 (0.00)
Non-Hispanic other	0.099 (0.01)	0.079 (0.00)	0.074 (0.00)	0.109 (0.00)	0.188 (0.00)	0.096 (0.00)	0.147 (0.00)
Age at wave 1	15.80 (0.12)	15.78 (0.17)	15.80 (0.17)	15.58 (0.26)	15.57 (0.30)	15.94 (0.15)	16.67 (0.18)
Time to first union formation/censored (wave 4)	23.42 (0.13)	22.12 (0.28)	21.87 (0.26)	22.12 (0.59)	21.26 (0.74)	22.21 (0.19)	21.98 (0.49)
Union Type (wave 4)							
No first union	0.174 (0.01)	0.109 (0.00)	0.077 (0.00)	0.125 (0.00)	0.146 (0.00)	0.140 (0.00)	0.122 (0.00)
First cohabitation	0.663 (0.01)	0.753 (0.00)	0.780 (0.00)	0.813 (0.00)	0.831 (0.00)	0.758 (0.01)	0.806 (0.00)
First marriage	0.163 (0.01)	0.138 (0.00)	0.145 (0.00)	0.063 (0.00)	0.026 (0.00)	0.101 (0.00)	0.069 (0.00)
Sibling dyad characteristics							
Had older sibling	0.428 (0.01)	0.367 (0.00)	0.250 (0.00)	0.459 (0.00)	0.275 (0.00)	0.412 (0.01)	0.520 (0.00)
Gender of sibling dyad							
Male reporting on female sibling	0.254 (0.01)	0.232 (0.00)	0.262 (0.00)	0.383 (0.00)	0.250 (0.00)	0.227 (0.00)	0.226 (0.00)
Female reporting on male sibling	0.269 (0.01)	0.225 (0.00)	0.312 (0.00)	0.268 (0.00)	0.250 (0.00)	0.256 (0.00)	0.160 (0.00)
Male reporting on male sibling	0.258 (0.01)	0.299 (0.00)	0.199 (0.00)	0.213 (0.00)	0.213 (0.00)	0.269 (0.00)	0.301 (0.00)
Female reporting on female sibling	0.219 (0.01)	0.244 (0.00)	0.226 (0.00)	0.137 (0.00)	0.288 (0.00)	0.248 (0.00)	0.317 (0.00)

Notes: The data is from Add Health waves 1 and 4. The table includes weighted proportions, means, and standard errors in brackets. "Other families" include households with no parents, multiple stepparents, and same-sex parents.

Figure 2: Distribution of Respondents by Family Structure at Wave 1 and First Union Formation



families at wave 1. Respondents from two biological parent families show lower levels of cohabitation than those from all other family types (Figure 2). In contrast, respondents from cohabiting families show the highest levels of first union formation through cohabitation and lowest through marriage. With the exception of respondents who are in other families at wave 1, respondents from blended families exhibit the highest levels of first union formation through both cohabitation and marriage. Respondents from stepfamilies have similar levels of cohabitation to respondents from single mother families but show slightly higher levels of marriage. The mean age at which a first union is formed or censored, follows similar patterns as those of cohabitation and marriage. Respondents from two biological parent families have the highest mean age (23.42) while individuals from blended families have the lowest (21.79). Respondents from step-and single mother families had lower mean ages at first union formation than those from two biological parent families but higher than those from blended families.

Across all family types, the majority of individuals are the older of the two siblings interviewed at wave 1. In blended families, three quarters of those interviewed were older

siblings (results not shown). The majority of sibling dyads in blended and two biological parent families are mixed gender pairs. Blended families also have the largest proportion of sibling dyads in which a female sibling is interviewed at wave 1.

Respondents from two biological parent and single mother families report the highest quality relationships with their mothers. More respondents (39.9%) from two biological parent families report relationships with their mothers that are above average in quality than below average (30.6%). For individuals from single mother families the corresponding proportions were 37.1% and 32.3%, respectively. More respondents from cohabiting families report below average than above average (44.5% vs. 22.7%)[8] relationships with their mothers. The reverse is true for those from married families. In contrast to respondents from two biological parent families, larger proportions of individuals from blended and stepfamilies report below average relationships with their mothers than above average. Individuals in single mother (4.18) and two biological parent (3.96) families have the highest mean number of activities with their mothers. Those from blended families do more activities (3.92) with their mothers than do individuals in stepfamilies (3.85) but not as many as siblings from two biological parent families.

Irrespective of the family structure they are in at wave 1, the majority of siblings (except those in cohabiting blended families) feel they are treated the same by their parents as their sibling. More respondents from married families than from cohabiting or single mother families report equal treatment by their parents. Where there is perceived unequal treatment, most respondents report that their sibling that is treated better, rather than themselves. Compared with other family types, siblings in stepfamilies report the highest mean level of conflict (2.29) and the lowest mean level of affection (2.56). In contrast, siblings in blended families have the

[8] The average proportions across cohabiting families.

Table 20: Respondent Characteristics from Add Health Wave 1 and Genetic Oversample (N = 3,481)

Variable name	Proportion / mean	SD	Range	n
Family structure at wave 1				
Two biological -parent families (ref)	0.54	0.50	0 – 1	1,879
Stepfamilies	0.14	0.35	0 – 1	494
Blended families	0.08	0.27	0 – 1	268
Single mother families	0.22	0.41	0 – 1	755
Other families	0.02	0.15	0 – 1	85
Relationship Quality				
Number of mother-adolescent activities	4	1.9	1 – 10	3,481
Mother-child relationship				
Below average	0.34	0.47	0 – 1	1,180
Average (ref)	0.32	0.47	0 – 1	1,110
Above average	0.34	0.47	0 – 1	1,191
Parental preferential treatment				
Sibling treated better	0.19	0.39	0 – 1	672
Equal treatment (ref)	0.76	0.43	0 – 1	2,630
Respondent treated better	0.05	0.22	0 – 1	179
Sibling affection	3	1.0	0 - 4	3,481
Sibling conflict	2.1	1.1	0 - 4	3,481
Respondent characteristics				
Family socioeconomic status	5.6	2.6	1 – 10	3,481
Female	0.51	0.50	0 – 1	3,481
Race/ethnicity				
Non-Hispanic white (ref)	0.58	0.49	0 – 1	2,031
Non-Hispanic black	0.19	0.39	0 – 1	667
Hispanic	0.08	0.27	0 – 1	280
Non-Hispanic other	0.14	0.35	0 – 1	503
Age at wave 1	16	1.7	11.9 – 21.3	3,481
Time to first union formation/censored	23	3.9	16 – 32.7	3,481
Union Type (wave 4)				
No first union	0.17	0.38	0 – 1	483
First cohabitation	0.66	0.47	0 – 1	1,871
First marriage	0.17	0.38	0 – 1	487
Sibling dyad characteristics				
Had older sibling	0.54	0.50	0 – 1	1,884
Gender of sibling dyad				
Male reporting on female sibling	0.19	0.39	0 – 1	652
Female reporting on male sibling	0.18	0.38	0 – 1	624
Male reporting on male sibling (ref)	0.31	0.46	0 – 1	1,067
Female reporting on female sibling	0.33	0.47	0 – 1	1,138

Notes: The data is unweighted. "Other families" include households with no parents, multiple stepparents, and same-sex parents. "ref" reference category.

highest mean level of affection (3.18) and the lowest mean level of conflict (2.13). Siblings in single mother families report the second highest mean level of affection (2.97) but report similar levels of conflict as siblings in two biological parent families.

Table 20 contains the descriptive statistics for the unweighted analytic sample 3. Because of the similarity of the results in Table 20 to those highlighted in the preceding discussion of the demographic profile, I will move directly to the results of the OLR analysis.

Multivariate Results

Table 21 contains the ordered logits (log-odds) from OLR analyses of sibling relationship quality regressed on family structure. A positive or negative logit indicates that for a one-unit increase in the value of a predictor, the response variable increases or decreases, respectively, by the size of the logit while all other variables in the model are held constant. Table 21A shows ten models for sibling relationship quality, five each for affection and conflict. I use siblings living in blended families at wave 1 as the reference category. Table 21B shows alternating omitted group comparisons using the fully adjusted models. Recall that for all the multivariate analyses the family structure measure was recoded so that remarried blended families are combined with cohabiting blended families (the same was done for stepfamilies) to increase the cell sizes. I model cohabitation with an indicator variable. Model 1 shows the zero-order effects of family structure on sibling-relationship quality and Model 2 indicates the importance of mother's cohabitation to sibling relationship quality. The other three models control for socio-demographic characteristics, sibling dyad characteristics, and mother-child relationship quality, respectively.

Family Structure and Sibling Affection: For affection, at both the bivariate and multivariate level, siblings in blended families are not significantly different from siblings in

other family structures at wave 1. Though not significant, the ordered logits for siblings from blended families being in a higher affection category is more than siblings from all other family types, after controlling for dyad characteristics and mother-child relationship quality (Models 4 and 5). This may indicate that the gender composition of sibling dyads and the quality of mother-child relationships work differently across family structures and shape the expression of sibling affection. These results partially support hypothesis 1 because there is no difference in sibling affection when comparisons are made with blended families. However, siblings in stepfamilies report significantly lower ordered logits of being in a higher affection category (Table 21B) when compared to siblings in two biological parent families. Including mother-child relationship quality measures partially mediates the difference in sibling affection reported by adolescents in these two families (results not shown). Living in a cohabiting family is not significantly related to sibling relationship quality.

Controls and Sibling Affection*:* The results in Models 3 and 4 indicate that female, minority, and older respondents, and sibling dyads that include girls report significantly more affection than male, non-Hispanic white, and younger respondents, and dyads with only boys. Specifically, net of controls, the ordered logit for siblings who are minorities being in the higher affection category is higher than that for non-Hispanic white siblings. Non-Hispanic blacks have the highest ordered logit (0.85) for being in a higher affection category compared to non-Hispanic whites. For each year a respondent ages, the ordered logit of being in the higher affection category increases by 0.08. The ordered logit for female respondents being in the higher affection category is 0.74 more than that of male respondents. I omit gender from Models 4 and 5 because it overlaps with the control for the gender composition of sibling dyads. In

Table 21A: Parameter Estimates from Ordered Logit Regression Models Predicting Sibling Affection and Conflict Using Family Structure (N = 3,481)

Variables	Model: Affection					Conflict				
Family structure (Blended families)	1	2	3	4	5	1	2	3	4	5
Two-biological-parent families	0.03	0.04	0.01	-0.01	-0.06	-0.00	-0.00	0.05	0.04	0.10
Stepfamilies	-0.24	-0.24	-0.24	-0.27	-0.27	-0.04	-0.04	-0.02	-0.06	-0.03
Single mother families	0.17	0.18	-0.08	-0.10	-0.08	0.20	0.20	0.34*	0.31*	0.30*
Other families	0.29	0.30	-0.05	-0.09	-0.06	-0.35	-0.36	-0.20	-0.27	-0.27
Cohabitation flag		0.08	-0.01	0.01	0.08		-0.00	0.03	0.06	-0.00
Background characteristics										
Family socioeconomic status			0.02	0.02	0.01			-0.01	-0.02	-0.02
Female			0.74***	-	-			0.29***	-	-
Non-Hispanic black			0.85***	0.84***	0.79***			-0.48***	-0.46***	-0.44***
Hispanic			0.31**	0.30*	0.37**			-0.15	-0.10	-0.13
Other race/ethnicity			0.20*	0.22*	0.25**			-0.20*	-0.16	-0.17
Respondent age (wave 1)			0.08***	0.09***	0.14***			-0.08***	-0.11***	-0.13***
Sibling characteristics										
(Same-sex male dyad)										
Female reporting on female sibling				1.04***	1.11***				0.30***	0.25**
Male reporting on female sibling				0.18*	0.22*				-0.08	-0.11
Female reporting on male sibling				0.43***	0.43***				0.23**	0.20*
Had older sibling				0.07	0.11				-0.32***	-0.31***
Mother-child relationships										
(Equal treatment)										
Sibling treated better					-0.35***					0.47***
Respondent treated better					-0.88***					0.49***
Number of mother-adolescent activities					0.06***					0.05**
(Average mother-child relationship)										
Below average mother-child relationship					-0.62***					0.14
Above average mother-child relationship					0.52***					-0.18*
Log likelihood	-4644.49	-4644.42	-4522.50	-4498.72	-4339.34	-5150.42	-5150.09	-5114.09	-5102.04	-5064.09
LR Chi-square	16.65**	16.78**	260.64***	308.19***	626.88***	11.41*	11.41*	84.07***	108.15***	184.06***
Pseudo R^2	0.002	0.002	0.028	0.033	0.067	0.001	0.001	0.008	0.011	0.018

Notes: Unweighted unstandardized coefficients shown *p≤0.05; **p≤0.01; ***p≤0.001. The reference category for categorical predictors are shown in brackets. "Other families" include households with no parents, multiple stepparents, and same-sex parents.

Model 4, sibling dyads where the focal respondent is female, have higher ordered logits of being in higher affection categories than male sibling dyads (net of all other covariates). Female dyads in particular have the highest ordered logit for being in a higher affection category, 1.04 more than male sibling dyads. These results are consistent with prior research, which suggest that culturally, kinship relations are more important for females and minorities (White & Reidmann, 1992).

Mother-child relationship quality (Model 5) is positively associated with sibling relationship quality. Net of all other covariates, adolescents who perceive that they or their sibling is treated better have lower ordered logits (-0.88 and -0.35) of being in high affection

Table 21B: Family Structure Omitted Group Comparisons for Ordered Logit Regression Models of Affection and Conflict (N = 3,481)

	Affection			**Conflict**		
	Omitted Group					
Family structure	Two biological parent	Blended	Step	Two biological parent	Blended	Step
Two biological -parent families	-	-0.06	0.21*	-	0.1	0.13
Stepfamilies	-0.21*	-0.27	-	-0.13	-0.03	-
Blended	0.06	-	0.27	-0.1	-	0.03
Single mother families	-0.02	-0.08	0.17	0.21*	0.30*	0.34**
Other families	-0.00	-0.06	0.21	-0.37	-0.27	-0.23
Cohabitation flag	0.08	0.08	-0.08	0.00	0.00	0.00

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: All models include socio-demographic, parent resources, sibling dyad, and mother-child relationship characteristics.

categories than siblings that are treated equally. Respondents who report below average mother-child relationship quality have -0.62 lower ordered logit of being in the higher affection category compared to those who report average relationship quality with their mothers. Conversely, the ordered logit for respondents who report above average relationship quality with their mother being in a higher affection category is 0.52 more than respondents that have average relationship

quality with their mother. Furthermore, every additional activity that an adolescent did with their mother increases the ordered logit of being in a higher affection category by 0.06.

Family Structure and Sibling Conflict: In the conflict models, only adolescents in single mother families differ significantly from those in blended families (Table 21A). The results of the zero order models show that family structure and cohabitation are not significantly related to sibling conflict. However, the coefficient for single mother families increases in size and becomes significant with the inclusion of the socio-demographic controls in Model 3. The ordered logit for siblings from single-mother families being in the higher conflict categories was 0.34 higher than that of siblings from blended families (net of controls). This change suggests that socio-demographic characteristics of respondents have a suppressive effect on the relationship between family structure and sibling conflict. Models 4 and 5 include sibling dyad characteristics and mother-child relationship quality. In each model, the size of the single mother families' coefficient decreases but remains significant (I obtain the same results when I alternate the comparison groups). This suggests that sibling dyad characteristics and mother-child relationship quality partially explains some of the differences in the level of conflict reported by siblings in single mother families. It appears that younger girls report higher levels of sibling conflict than their older male siblings do, and that their mothers can reduce the level of conflict by treating them equally while cultivating positive parent-child bonds.

Single mother families are a heterogeneous group consisting of sibling pairs that have varying degrees of genetic relatedness. Further analysis shows that it is single mother families with full siblings (vs all other single mother families) that report more conflict and affection (see Appendix 2). Net of controls, the ordered logit for single mother families with full siblings being in a higher conflict category was 0.40 more than were siblings in blended, 0.42 more than

siblings in stepfamilies, and 0.35 more than those in two biological parent families. They were not significantly different from siblings in two biological parent or blended families in their levels of affection for each other. Their ordered logits of being in the higher levels of affection was 0.45 more than siblings in stepfamilies in the zero order models but this effect is fully mediated by the inclusion of socio-demographic controls. The gender combination of the sibling pair is also important. Compared to all male dyads, female dyads report the highest level of conflict and male dyads the lowest level of affection (compared to sibling dyads in blended families).

The results do not support hypothesis 2. Sibling relationships in blended families are not significantly different from those in step- or two biological parent families. However, in comparison to siblings in blended families, the signs of the coefficients suggest that siblings in two biological parent families report more conflict while siblings in stepfamilies report less conflict. It does not appear that the genetic relationship (full vs step-) between siblings matters in stepfamilies as it does in single mother families. There is also no support for hypothesis 3: the quality of sibling relationships in step- and blended families is not associated with the marital status of parents.

Controls and Sibling Conflict*:* Male, older, and minority respondents report less sibling conflict than their female, younger, and non-Hispanic white counterparts. Female respondents have higher ordered logits (0.29) of being in the higher conflict categories than male respondents (Model 3 of the conflict OLR models in Table 21A). All minorities have lower ordered logits than non-Hispanic whites of being in the higher conflict categories but only non-Hispanic blacks have significantly lower levels of conflict (net of all covariates). For each year a respondent ages, the ordered logits of being in a higher conflict category decreases by -0.08. This effect increases

with the inclusion of both sibling characteristics (-0.11) and mother-child relationship quality (-0.13).

The results for sibling characteristics included in Model 4 are consistent with the effects of gender and age. The ordered logits for sibling dyads with a female sibling reporting on the level of conflict in the relationship being in higher conflict categories are significantly higher (0.30 for female dyads and 0.23 for mixed gender dyads) than male dyads. Sibling dyads where a younger sibling reports on the level of conflict with an older sibling, have significantly lower logits of being in higher conflict categories than dyads where the older sibling makes the report.

Overall, good mother-child relationship quality significantly lowers sibling conflict (Model 5). Siblings who report unequal treatment, irrespective of whether they are the beneficiary of preferential treatment from their mothers, have higher ordered logits (0.47 and 0.49) of being in high conflict categories compared to sibling dyads who report no preferential treatment. Surprisingly, for every additional activity that siblings do with their parents, their ordered logits of being in higher conflict categories increases by 0.05, holding all other variables constant. Doing more activities may provide greater opportunities for sibling engagement and therefore conflict. The ordered logit for siblings with above average mother-child relationships being in higher conflict categories was -0.18 lower than siblings that have average mother-child relationships. Siblings that have below average relationships with their mothers are not significantly different from those with average mother-child relationships although the coefficient is positive.

Summary

Increasingly more children find themselves in blended families (Kreider & Ellis, 2011). These families are difficult to measure, and as a result are underestimated (Gennetian, 2005).

There is also very little research on sibling relationships in these families. In this chapter, the analyses have been estimating the proportion of blended families, developing a descriptive profile of blended families, and evaluating three hypotheses. These hypotheses posit that: (1) sibling affection will not vary across family structure; (2) sibling relationships in blended families are less negative than full sibling relationships in two biological and stepfamilies but more negative than stepsiblings in stepfamilies; and (3) sibling relationships in married families are less negative than those in cohabiting families are.

In brief, the results show that blended families with two adolescents make up approximately seven percent of all U.S. families with two children. The overall profile reveals that these families share features with both two biological parent and stepfamilies but are a distinct family structure. For instance, siblings in blended families report the highest levels of affection and lowest level of conflict when compared to two-biological parent and stepfamilies. As anticipated, multivariate analyses show that siblings in blended families do not significantly differ in their reports of affection from all other families. Siblings in stepfamilies are, however, less affectionate than their counterparts in two biological parent families. There is very little support for the other two hypotheses. Siblings in blended families are only significantly different from those in single mother families. There is some indication that half siblings are somewhere in between those in two biological parent families and stepfamilies. The marital status of parents in step- and blended families is not related to sibling conflict.

CHAPTER VIII: FAMILY STRUCTURE AND FIRST UNION FORMATION

In this chapter, I report the Cox regression results for the analysis of the relationship between family structure, sibling relationships, and first union formation. I evaluate five hypotheses. First, compared to young adults from two biological parent families, respondents from blended and other non-two biological families will form first unions at earlier ages (4)[9]. Second, treating cohabitation and marriage as competing risks, individuals from cohabiting blended, cohabiting step-, and single mother families will have higher rates of cohabitation and lower rates of marriage compared to those from two biological families (5). Third, young adults from married step- and blended families will be likelier to form both types of unions than counterparts from two biological parent families (6). Fourth, siblings with lower quality relationships form first unions at younger ages than their counterparts with higher quality relationships (7). Fifth, when they do form unions, they will have higher rates of cohabitation and lower rates of marriage compared to individuals with higher quality sibling relationships (8).

The results are presented in two sections. Each section contains the Cox regression results for the effect of family structure on the timing to first co-residential union formation (no union vs. either cohabitation or marriage) and competing risk models for the effect of family structure on the type of first union formed (cohabitation vs. marriage and marriage vs. cohabitation). In the first section, I present the Cox models with controls for socioeconomic and demographic differences. In the second section, I include sibling relationship quality as a mediator and mother-child relationship quality as a control variable. All analyses presented here use analytic sample 3 (unweighted). As with the analysis of the relationship between family structure and

[9] Numbers in brackets refer to numbered hypotheses in Table 4.

sibling relationship quality, I also estimate the Cox regression models using analytic sample 2. Both the weighted and unweighted results of these supplemental analyses are in Appendix 2.

Results

Family Structure and Timing of First Union Formation

Table 22A shows two models for the relationship between family structure at wave 1 and any first union formation. Model 1 is the bivariate model for first union formation. Model 2 shows the effect for family structure controlling for socio-demographic controls. I include both the hazard coefficients and the hazard ratios in each model but I only interpret the ratios. Hazard ratios that have a value of 1 indicate no relationship. A value less than 1 indicates a slower rate

Table 22A: Parameter Estimates from Cox Proportional Hazards Models for Family Structure and the Risk of Any First Union Formation (N = 3,331)

	Model					
Variables	**1**			**2**		
Family structure (Blended families)	**b**		**Hazard**	**b**		**Hazard**
Two biological –parent	-0.58	***	0.56	-0.56	***	0.57
Stepfamilies	-0.15	*	0.86	-0.17	*	0.85
Single mother families	-0.36	***	0.70	-0.33	***	0.72
Other families	0.03		1.03	0.11		1.12
Cohabitation flag	-0.12		0.89	-0.14		0.87
Background characteristics						
Family socioeconomic status				-0.06	***	0.94
Female				0.34	***	1.40
Non-Hispanic black				-0.44	***	0.65
Hispanic				-0.16	*	0.85
Other race/ethnicity				-0.40	***	0.67
Respondent age (wave 1)				-0.02		0.98
N of events = 2,764						

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Data from Add Health wave 1 and the genetic oversample (unweighted). Models are adjusted for left truncation. Reference categories are in brackets.

of union formation and a value greater than 1 indicates a faster rate of union formation. Blended families are the omitted group.

The bivariate model shows that there is a significant relationship between family structure and the rate of first union formation. In model 1, compared to blended families, young adults who are from two biological parent, step-, or single mother families have significantly lower risks of first union formation. Individuals from two-parent biological families have the lowest risk of first union formation. Their hazard of first union formation is 56% of the hazard for those from blended families. Respondents from single mother families and stepfamilies have 70% and 86% of the hazard for individuals from blended families, respectively. The coefficient for stepfamilies is not significant when the analysis is replicated using the unweighted analytic sample 2.

After adjusting for socio-demographic characteristics (Model 2), the hazard ratios for two parent biological families and single-mother families slightly decrease (become closer to 1) but the ratio for stepfamilies increases. These changes suggest that socio-demographic controls mediates some of the difference between blended and single mother and blended and two biological parent families but acts as a suppressor for the difference between blended and stepfamilies.

In order to assess the relative importance of each family structure on the rate of first union formation, I repeat the analysis shown in Model 2 but change the omitted category (Table 22B). Compared to young adults from two biological parent families, those from blended families have a 74% higher risk of forming a first union at each age, and an 18% higher risk compared to those from stepfamilies. Respondents from single mother families had lower rates of first union formation than those from blended (72%) and those from stepfamilies (85%). In

sum, individuals from blended families have the highest rate of first union formation, followed by those from stepfamilies, single mother families, and two parent biological families, in that order. These results support the first hypothesis because respondents from all non-two biological parent families formed first unions at younger ages than those who grew up in two biological parent families.

Controls and Timing of First Union Formation*:* Among the controls, family socioeconomic status (SES), race/ethnicity, and gender are significantly related to the rate of first union formation. For each unit increase in SES, the hazard of first union formation decreases by six percent (Teachman, 2004; Axinn and Thornton, 1993; Thornton, 1991). Women have 1.4 times the risk of forming first unions compared to men (Uecker & Stokes, 2008). Compared to non-Hispanic whites, all minorities have lower rates of first union formation. Non-Hispanic

Table 22B: Family Structure Omitted Group Comparisons and the Risk of any First Union Formation (N= 3,331)

	Omitted Group					
Variables	Two biological -parent		Blended		Step	
Family structure	**Hazard Ratios**					
Two biological -parent families	-		0.57	***	0.68	***
Stepfamilies	1.48	***	0.85	*	-	
Blended families	1.74	***	-		1.18	*
Single mother families	1.25	***	0.72	***	0.85	**
Other families	1.95	***	1.12		1.32	*
Cohabitation flag	0.87		0.87		0.87	

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Add Health wave 1 and genetic oversample (unweighted). Models adjusted for left truncation. Socioeconomic and demographic controls are included in all models.

blacks in particular have lower rates of first union formation; their hazard is 65% of that of non-Hispanic whites (Uecker & Stokes, 2008).

Family Structure and Type of First Union Formed: Cohabitation or Marriage

From the preceding discussion, it is evident that spending time in blended families increases the rate of forming any first co-residential union when compared to all other family types. This does not mean that the result will be the same when individuals form first unions through cohabitation or marriage. To answer this question, I repeat the analysis using competing risk Cox models and show the results in Table 23. For both marriage and cohabitation the first model is the zero order model, Model 2 assesses the effect of cohabitation, and Model 3 is the adjusted model.

Cohabitation: Both the baseline and adjusted models indicate that young adults who are from two biological parent and single mother families have significantly lower risks of forming first unions through cohabitation than their counterparts who are in blended families at wave 1. From Model 1, individuals who are from two biological families have a hazard of cohabitation that is 53% of the hazard of those from blended families. Similarly, those from single mother families have a hazard that is 76% of the hazard of those from blended families. Model 2 indicates that there is no relationship between living in a cohabiting family and the risk of cohabitation. Controlling for socioeconomic and demographic characteristics (Model 3) mediates some of the difference between blended families and two biological parent families and blended families and single mother families.

Controls and the Cohabitation Rate: Model 3 shows that there are significant relationships between all socioeconomic and demographic controls and the risk of forming a first union by cohabitation. The hazard for women is 33% higher than the hazard for men. For every one-month increase in age at wave 1, the risk of forming a first union by cohabitation decreases by four percent. With every one-unit increase in family SES, the risk declines by six percent. The

hazard of forming a first union through cohabitation for non-Hispanic blacks is 70% of the hazard for non-Hispanic whites. For Hispanics it is 85% of that of non-Hispanic whites.

Marriage: In the marriage models, young adults from two biological parent, stepfamilies, and single mother families have lower risks of first union formation through marriage compared to respondents from blended families (Model 1). The hazards of marriage for individuals from two biological parent, stepfamilies, and single mother families are 72%, 69%, and 48%, respectively, of the hazards for those from blended families. Residing in cohabiting (blended and step-) families also lowers the risk of marriage (Model 2). The hazard for individuals from cohabiting families is 46% of the hazard for those from blended families. The rate of marriage decreases further for two biological parent (67%) and single mother families (45%) with the inclusion of the cohabitation flag.

In Model 3, net of socioeconomic and demographic covariates, the hazard of marriage for individuals from two biological families, stepfamilies, and single mother families is 63%, 65%, and 48% respectively, of the hazard for those from blended families. The controls act as suppressors, increasing the differences between two biological parent families and blended families, and stepfamilies and blended families, but mediates some of the difference between single mother families and blended families.

Controls and the Marriage Rate: Among the socioeconomic and demographic variables, the risk of marriage significantly decreases as family SES increases and if respondents are African Americans. The risk of marriage is significantly higher for women and increases with

Table 23: Parameter Estimates from Cox Proportional Hazards Models for Family Structure and the Competing Risks of First Cohabitation and Marriage Formation (N =3,331)

	Cohabitation						Marriage					
Variables	**Model**						**Model**					
Family structure	**1**		**2**		**3**		**1**		**2**		**3**	
(Blended families)	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**
Two-biological-parent	-0.64 ***	0.53	-0.64 ***	0.53	-0.59 ***	0.55	-0.33 *	0.72	-0.40 **	0.67	-0.46 **	0.63
Stepfamilies	-0.11	0.90	-0.11	0.90	-0.11	0.90	-0.37 *	0.69	-0.37 *	0.69	-0.43 *	0.65
Single mother families	-0.27 ***	0.76	-0.27 ***	0.76	-0.25 ***	0.78	-0.74 ***	0.48	-0.80 ***	0.45	-0.74 ***	0.48
Other families	0.11	1.11	0.11	1.11	0.20	1.23	-0.33	0.72	-0.40	0.67	-0.35	0.70
Cohabitation flag			-0.02	0.98	-0.04	0.96			-0.77 *	0.46	-0.79 *	0.46
Background characteristics												
Family socioeconomic status					-0.06 ***	0.94					-0.07 ***	0.93
Female					0.28 ***	1.33					0.56 ***	1.74
Non-Hispanic black					-0.36 ***	0.70					-0.90 ***	0.41
Hispanic					-0.17 *	0.85					-0.17	0.85
Other race/ethnicity					-0.48 ***	0.62					-0.18	0.84
Respondent age (wave 1)					-0.04 **	0.96					0.07 **	1.07
N of events	**2,208**						**556**					

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Add Health wave 1 and genetic oversample (unweighted). Models are adjusted for left truncation. Reference categories are in brackets.
Please note that only 50 cases for blended families experienced marriage.

the age of respondents at wave 1. For every one-unit increase in SES, the risk of marriage decreases by seven percent. The risk of marriage for African Americans is 41% that of non-Hispanic whites. The hazard of marriage for women is 74% higher than the hazard for men. For every one-month increase in age, the risk of marriage increases by seven percent.

The cohabitation rates of the various family structure types, listed in descending order of magnitude, are as follows: blended families, stepfamilies, single mother families, and two biological parent families. This pattern is similar to the results for the rate of first union

Table 24: Family Structure Omitted Group Comparisons Competing Risks of First Cohabitation and Marriage (N = 3,331)

Family structure	Two biological		Blended		Step-	
Competing risk: First Cohabitation			**Hazard Ratios**			
Two biological parent families			0.55	***	0.62	***
Stepfamilies	1.62	***	0.90			
Blended families	1.81	***			1.12	
Single mother families	1.41	***	0.78	**	0.87	*
Other families	2.22	***	1.23		1.37	*
Cohabitation flag	0.96		0.96		0.96	
Competing risk: First Marriage						
Two biological -parent families			0.63	**	0.97	
Stepfamilies	1.03		0.65	*		
Blended families	1.58	**			1.54	*
Single mother families	0.76	*	0.48	***	0.74	
Other families	1.11		0.70		1.09	
Cohabitation flag	0.46	*	0.46	*	0.46	*

*p≤0.05; **p≤0.01; ***p≤0.001
Notes: Add Health wave 1 and genetic oversample (unweighted). Models adjusted for left truncation. Socioeconomic and demographic controls are included in all models. Note that only 76 cases for blended families experienced marriage.

formation. Young adults from two biological parent families are least likely to form first unions through cohabitation compared to all other family types (Table 24). Among non-two biological parent families, individuals from single mother families have lower risks than both blended and stepfamilies. Respondents from blended families are not significantly different from their counterparts in stepfamilies. The pattern for the risk of marriage is less clear. Individuals from all families (except the residual category) had lower risks of marriage than those from blended families. There is no significant difference between two biological parent and stepfamilies. There is also no difference between step- and single mother families but individuals from single mother families have significantly lower risks of marriage than those from two biological parent families.

These results, for the most part, are consistent with hypotheses two and three. Compared to individuals from two biological parent families, respondents from blended, step- and single mother families have significantly higher rates of cohabitation, but only individuals from single mother families have significantly lower rates of marriage. The seeming unimportance of the marital status of parents to their children forming their own cohabiting unions may reflect the growing prevalence of cohabitation as the first co-residential union of respondents (irrespective of childhood living arrangements). Growing up in a cohabiting family is however important for marriage rates. The fact that the cohabitation flag is significant after changing the reference categories indicates that compared to their counterparts from two biological parent and married families, respondents from cohabiting families have significantly lower rates of marriage. The absence of a significant difference in marriage rates between individuals from step- and two biological parent families is surprising but may be explained by the significance of blended families that were not distinguished from stepfamilies in prior research.

The conflation of step- and blended families may also be relevant to explaining the results for hypothesis three. Only individuals from blended families (compared to respondents from two biological parent families) have higher rates of both cohabitation and marriage. Individuals from stepfamilies show elevated rates of cohabitation but not marriage. Although the coefficient for stepfamilies is not significant, the hazard ratio becomes greater than one after the inclusion of the cohabitation flag (results not shown). This suggests that marriage rates are higher for individuals from married stepfamilies, but not significantly higher than those from two biological parent families.

Family Structure, Sibling Relationships, and Timing of First Union Formation

In Table 25, I show the hazard ratios from the sibling relationship quality-mediation Cox models for family structure and the rate of first union formation. Model 1 is the zero order model. For subsequent models, I enter the control variables in stepwise blocks: Model 2 controls for cohabitation; Model 3 for socioeconomic and demographic variables; Model 4 for mother-child relationship quality measures; and Model 5 for sibling relationship quality measures. I structure the competing risk models displayed in Table 26 in the same way. Throughout the following discussion, I note where the addition of blocks of controls have significant suppressor or mediation effects.

In Model 1, young adults who are from two biological parent families or single mother families at wave 1 have lower rates of first union formation than those who are from blended families. The hazard for forming any union for individuals from two biological parent families is 55% of the hazard of individuals from blended families. The hazard for individuals from single mother families is 70% of the hazard for those from blended families. The addition of the cohabitation flag, though it is not significant, increases the difference between two biological

parent and blended families and single mother and blended families. In Models 3-5, socioeconomic and demographic controls mediate some of the effects of family structure but neither the mother-child relationship quality, nor sibling relationship quality, are related to the timing of first union formation. The results do not support hypothesis four; sibling relationship quality is not important to the age at which respondents form their first co-residential unions.

Table 25: Parameter Estimates from Cox Proportional Hazards Models for Family Structure, Sibling Relationship Quality and the Risk of any First Union Formation (N =2,759)

Variables					
Family structure	Model				
(Blended families)	**1**	**2**	**3**	**4**	**5**
Two-biological-parent	0.55***	0.54***	0.57***	0.57***	0.57***
Stepfamilies	0.85	0.85	0.85	0.85	0.85
Single mother families	0.70***	0.69***	0.71***	0.71***	0.71***
Other families	1.07	1.05	1.15	1.14	1.14
Cohabitation flag		0.84	0.82	0.81	0.81
Background characteristics					
Family socioeconomic status			0.94***	0.94***	0.94***
Female			1.39***	1.41***	1.39***
Non-Hispanic black			0.65***	0.66***	0.65***
Hispanic			0.88	0.88	0.87
Other race/ethnicity			0.68***	0.68***	0.67***
Respondent age (wave 1)			0.99	0.98	0.98
Mother-child relationships					
Number of mother-adolescent activities				0.99	0.98
(Average mother-child relationship)					
Below average mother-child relationship				1.1	1.09
Above average mother-child relationship				0.97	0.96
Sibling Relationship Measures					
Affection					1.07
Conflict					1
(Equal treatment)					
Sibling treated better					1.08
Respondent treated better					1.04
N of events	**2,276**				

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Add Health wave 1 and genetic oversample (unweighted). Models are adjusted for left truncation. Reference categories are in brackets.

Family Structure, Sibling Relationships and Type of First Union Formed: Cohabitation or Marriage

Mother-child and sibling relationships are important for the type of first union formed (Table 26). Models 1-3 for cohabitation are similar to the results in Table 25. That is, young adults from two biological parent and single mother families have significantly lower risks of forming either union than those from blended families. The cohabitation flag (not significant) variable increases the difference between the groups and socioeconomic and demographic controls mediate the effect of family structure on the risk of cohabitation. However, in Model 4, net of all covariates, the respondents who have poor relationships with their mothers had an 18% higher risk of forming a first union through cohabitation than those with normative mother-child relationships. In Model 5, this risk drops to 15% with the addition of the sibling relationship quality measures, particularly the parental preferential treatment measures. This suggests that when respondents have poor relationships with their mothers they also think she treats their siblings better. Siblings who thought their parents treated their other sibling better than they are treated have a 14% higher risk of cohabitation than siblings that report equal treatment by their parents (net of all covariates). The net effect of the relationship quality measures on family structure and risk of cohabitation is that they do not appear to mediate the difference between young adults from two biological parent families and blended families. However, they may (partially) suppress the difference between single mother families and blended families.

For the marriage models, Model 1 shows that only young adults from single mother families have significantly lower risks of marriage than those from blended families. With the inclusion of the cohabitation flag in Model 2, the difference between two biological parent and blended families become significant. This may indicate that individuals from two biological parent families have significantly lower rates of marriage compared to respondents from married

Table 26: Parameter Estimates from Cox Proportional Hazards Models for Family Structure, Sibling Relationship Quality and Competing Risks of First Cohabitation or Marriage (N =2,759)

Variables	Cohabitation					Marriage				
Family structure	Model									
(Blended families)	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Two-biological-parent	0.51***	0.50***	0.55***	0.55***	0.55***	0.72	0.67*	0.65*	0.65*	0.64*
Stepfamilies	0.89	0.89	0.90	0.90	0.90	0.69	0.69	0.65	0.66	0.67
Single mother families	0.74**	0.73**	0.76**	0.76**	0.75**	0.54**	0.50**	0.54**	0.54**	0.55**
Other families	1.12	1.11	1.25	1.24	1.24	0.85	0.79	0.79	0.8	0.81
Cohabitation flag		0.92	0.91	0.89	0.88		0.47	0.46	0.46	0.46
Background characteristics										
Family socioeconomic status			0.94***	0.94***	0.94***			0.93***	0.93***	0.93***
Female			1.31***	1.33***	1.33***			1.74***	1.71***	1.64***
Non-Hispanic black			0.71***	0.72***	0.72***			0.43***	0.43***	0.41***
Hispanic			0.85	0.85	0.85			0.98	0.99	0.96
Other race/ethnicity			0.63***	0.62***	0.62***			0.84	0.85	0.84
Respondent age (wave 1)			0.96**	0.95**	0.95**			1.10**	1.10***	1.09**
Mother-child relationships										
Number of mother-adolescent activities				0.98	0.98				1.02	1.02
(Average mother-child relationship)										
Below average mother-child relationship				1.18**	1.15*				0.84	0.89
Above average mother-child relationship				0.95	0.96				1.01	0.96
Sibling Relationship Measures										
Affection					1					1.42**
Conflict					1.01					0.94
(Equal treatment)										
Sibling treated better					1.14*					0.87
Respondent treated better					1.07					0.91
N of events	**1,791**					**485**				

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Add Health wave 1 and genetic oversample (unweighted). Models are adjusted for left truncation and include socio-demographic, parent investment, and sibling relationship controls. Reference categories are in brackets.

blended families. The hazard of marriage (Model 2) for respondents from two biological and single mother families was 67% and 50% that of respondents from blended families, respectively. The socioeconomic and demographic variables act as suppressors, increasing the difference between two biological and blended families and as mediators, decreasing the difference between single mother and blended families (Model 3). Mother-child relationship quality did not mediate the relationship between family structure and the risk of marriage (Model 4).

In Model 5, sibling affection increases the risk of marriage (net of all other covariates). For every unit increase in affection, the risk of marriage increases by 42%. Sibling affection may partially mediate the difference between the respondents from single mother families and blended families (55% vs 54% in Model 4) but increases the difference between those from two biological and blended families (64% vs 65% in Model 4). It also appears to mediate the effect of gender and suppresses the effect of race/ethnicity. Specifically, the hazard of marriage for women is 64% higher than that of men when sibling affection is in the model and 71% (Model 4) when it is excluded. For race/ethnicity, the hazard of marriage for non-Hispanic blacks is 41% that of non-Hispanic whites, but is 43% when I exclude sibling affection.

These results run contrary to what was predicted in hypothesis five. Sibling conflict is not associated with cohabitation or marriage rates (though the direction of the coefficients are as anticipated). Unexpectedly, sibling affection increases marriage rates. It appears that sibling affection may mean different things for two parent and non-two parent biological families. In two biological parent families, affection may mean delaying marriage and in blended and single mother families, it encourages early marriage. Sibling affection may be more important in blended families because socio-cultural expectations for half-siblings are less clearly defined

than those for full siblings. Consequently, parents may encourage more positive sibling relationships than in other contexts.

Summary

In summary, of the five hypotheses examined in this chapter, there is support for three. To recap, respondents from all non-two biological parent families form first unions at younger ages than those who grew up in two biological parent families (4). The type of first union formed varies with the type of families individuals lived in at wave 1. Compared to individuals from two biological parent families, respondents from blended, step- and single mother families have significantly higher rates of cohabitation, but only individuals from single mother families have significantly lower rates of marriage (5). Individuals from married blended families (compared to respondents from two biological parent families) have higher rates of cohabitation and marriage. Individuals from remarried stepfamilies show significantly elevated rates of cohabitation but not marriage (6). Sibling relationship quality is not important to the age at which respondents form their first co-residential unions (7). It is however, associated with the type of first union formed though not in the way expected. Sibling conflict is not associated with cohabitation or marriage rates but sibling affection increases marriage rates (8).

CHAPTER IX: DISCUSSION

Using the incomplete institutionalization hypothesis, family boundary ambiguity, and prior literature, this dissertation extends the literature on family structure and child wellbeing by examining the relationship among blended families, sibling relationships, and first co-residential union formation. The emerging literature on blended families suggests three things. First, blended families have been misclassified as either two biological parent or stepfamilies in prior research. Researchers show that identifying the half sibling relationship is the key to measuring blended families but this does not remove the misclassification errors that result from family boundary ambiguity, nor do they measure cohabiting blended families. Second, compared to two biological parent families, blended families are less beneficial for children but these findings are based on a narrow set of outcomes, which are measured for the most part in childhood. Examining an adult outcome such as union formation may fill this gap. Third, the typical mechanisms used to explain the disadvantage of children from non-two biological families do not work for blended families (Halpern-Meekin & Tach, 2008; Ginther & Pollak, 2004; Strow & Strow, 2008; Gennetian, 2005). Sibling relationships may offer a much-needed link between blended families and child well-being.

I add to the literature on blended families by exploring the gaps identified above. I do this by answering the following questions. How does taking family boundary ambiguity and the proportion of cohabiting blended families into account improve the measurement of blended families? What proportion of the adolescent population in households with two children resides in cohabiting and married blended families? How do sibling relationships differ in blended families compared to other families? How does timing and type of first co-residential union formation for individuals from blended families compare to those from other families? If there is a difference in the pattern of first union formation between blended and other families, is this

difference mediated by sibling relationship quality? Table 27, on the next page, restates some of these questions as hypotheses and summarizes the results obtained from Chapters VII and VIII.

I analyzed data from waves 1 and 4 from the National Longitudinal Study of Adolescent Health (Add Health) for the analyses, except where noted. Add Health is a longitudinal nationally representative sample of adolescents in grades 7-12 selected from 132 high schools in the United States. Data for wave 1 was collected from adolescent in 1995 and respondents subsequently followed through to wave 4 in 2008. At wave 1, there are 20,745 in the in-home sample with accompanying information from 17, 670 parents and 15,701 at wave 4. The in-home sample consists of a core sample (N = 12,105) and five supplemental samples. The five supplemental groups comprised a genetic supplement, students of Chinese, Puerto Rican, or Cuban descent, disabled students, and African American students with highly educated parents. The genetic supplemental sample consists of four groups: twins, full siblings, half-siblings and unrelated adolescents living in the same household. The genetic supplement component comprised of 3,139 sibling pairs raised in the same household and having varying degrees of genetic relatedness: twins (both monozygotic and dizygotic), full siblings, half-siblings, and unrelated adolescents. These sibling pairs are interviewed at every wave with average response rates of over 90% (Harris et al., 2012). Some of these adolescents are also in the core in-home sample but those who are not have no information available to compute sampling weights.

First, I used cross-tabulations to detect family boundary ambiguity in sibling and mother-adolescent pair reports of family structure. Discrepant reports given by siblings about their family structure indicated family boundary ambiguity. The analysis shows that there is a direct association between family boundary ambiguity and family complexity, which is consistent with the incomplete institutionalization hypothesis, family boundary ambiguity, and previous research

Table 27: Summary of Findings Organized by Hypotheses

Hypotheses	Result
1) Sibling affection will not vary across family structure.	Sibling affection in Blended families is not significantly different from all other families.
2) Sibling relationships will be less negative in blended families than in families with full siblings (two biological parent, step-, and single parent families), but more negative than in stepfamilies with stepsiblings.	Siblings in blended families only significantly differ from full siblings in single mother families in their reports of conflict.
3) Sibling relationship quality in married families will be less negative than that in cohabiting families.	Sibling affection and conflict are not associated with the marital status of a respondent's parents.
4) Adults from blended families and those from other non-two biological parent families will form unions at earlier ages than those from two biological parent families.	Young adults from blended families do form first co-residential unions at younger ages than their counterparts from two biological parent families.
5) Compared to individuals from two biological parent families, individuals from cohabiting blended, cohabiting step-, and single-mother families will be more likely to form first unions through cohabitation, and less likely to form them through marriage.	Compared to individuals from two biological parent families, respondents from blended, step- and single mother families have significantly higher rates of cohabitation, but only individuals from single mother families have significantly lower rates of marriage.
6) Adults from married step- and blended families will be likelier to form both types of unions than counterparts from two biological parent families.	Individuals from blended families (compared to respondents from two biological parent families) have higher rates of cohabitation and marriage. Individuals from stepfamilies show significantly elevated rates of cohabitation but not marriage.
7) Siblings with lower quality relationships will form first co-residential unions at younger ages than their counterparts with higher quality relationships.	Sibling relationship quality is not important to the age at which respondents form their first co-residential unions.
8) Individuals who have lower quality sibling relationships will have higher rates of cohabitation and lower rates of marriage compared to individuals with higher quality sibling relationships.	Sibling conflict is not associated with cohabitation or marriage rates but sibling affection increases marriage rates.

(Cherlin, 1978; Brown & Manning, 2009; White, 1998; Gennetian, 2005). As expected, the vast majority (98%) of sibling pairs in two biological parent families agree about their family type. Married families are considerably less ambiguous than cohabiting families. Agreement about family structure is a little over 90% for both married step- and blended families but 64.3% in cohabiting stepfamilies and 42.9% in cohabiting blended families. Overall, family boundary ambiguity affects approximately six percent of all families, most of which are non-two biological parent families. Family boundary ambiguity using sibling reports is not as high as when using mother-child reports but the similarity with the results of prior research suggests that family boundary ambiguity equally affects all complex family relationships. Therefore, it might not matter which pair of reports is used to assess family boundary ambiguity. Fewer inconsistent sibling pair reports could mean that such reports of family structure are better than mother-child reports. Alternatively, it may have something to do with the use of the genetic oversample. The problems associated with family boundary ambiguity may extend to sibling relationship quality reports (most reports are those of full siblings), but it may also be the failure on the part of the Add Health interviewers to ask these questions of all siblings in the Add Health sample, or a combination of both. The important take-away point is that family boundary ambiguity disproportionately affects complex families, the estimates of individuals who live in these families, and possibly, the outcomes associated with growing up in these families.

I used STATA survey estimation procedures to count blended families and generated weighted means and proportions of social and demographic characteristics for each family type. My analysis shows that blended families with two children in the household make up approximately seven percent of the U.S. population. Unlike Gennetian's (2005) estimate of blended families of 13%, the figure may be lower than anticipated because the sample is

restricted to families with two children, so the estimate does not include blended families with more than two adolescents. Consistent with what was expected, the descriptive characteristics of blended families suggests that blended families are similar to two biological parent and stepfamilies but are not quite like one or the other: they occupy the area in-between the two. For instance, as with step- and two biological parent families, the majority of children in blended families live with married parents (5.8%) at wave 1. Like step- and two biological parent families, married blended families have better socioeconomic characteristics and family relationships than cohabiting blended families, a finding supported by Manning and Lamb (2003) and Manning, Smock, and Majumbar (2004). Like stepfamilies, they have higher rates of cohabitation and lower rates of marriage than children in two biological parent families. However, there are marked differences. Blended families have less favorable socioeconomic characteristics compared to both step- and two biological parent families. Despite this, they also report more positive sibling relationships than all other families.

Second, I used ordered logit regression to investigate how sibling relationship quality in blended families differs from that in other families. As I expected, siblings in blended families do not significantly differ in their reports of affection from all other family types, a finding supported by prior research (Anderson, 1999; Deater-Deckard, Dunn, & Lussier, 2002). However, changing the comparison group to two biological parent families shows that siblings in stepfamilies are significantly less affectionate, which was not expected. For sibling conflict, I thought that siblings in blended families would report more conflict than stepsiblings in stepfamilies, but less conflict than full siblings in two biological parent and stepfamilies. As it turns out, siblings in blended families are not significantly different from siblings in either family type. However, consistent with Jenkins et al. (2005), and Deater-Deckard, Dunn, and Lussier

(2002), full siblings in single mother families report significantly more conflict than all two-parent families. I expected sibling conflict to be worse in cohabiting than married stepfamilies but the level of conflict reported by siblings is not associated with their parents' marital status. Children in blended families report more affection than all other families and report levels of conflict in-between those of two biological parent families and stepfamilies (not significant).

I posit that siblings in blended families are best thought of as "in-betweeners". They share some characteristics with siblings from two biological parent and stepfamilies. The "in between" state of blended families is supportive of the incomplete institutionalization perspective. Blended families have more shared biological relationships than stepfamilies, which would make the family type more "institutionalized". Both the descriptive profile and OLR results lend some support to the idea that blended families have better articulated normative guidelines for sibling behavior than stepfamilies. Accounting for socioeconomic, demographic, sibling dyad, and family relationship characteristics does not explain the differences between blended families and other families. However, it shows that sibling affection levels are highest in blended families and sibling conflict levels are lower than two biological parent families but higher than reported in stepfamilies. The persistence of high levels of affection at the multivariate level and the pattern of suppression and mediation that accompanies the inclusion of controls suggest that parents in blended families emphasize good sibling relationship quality more than parents in other families.

Third, I used Cox regression models to investigate the relationship between family structure and first co-residential union formation behavior. I find that young adults from all non-two biological parent families form first co-residential unions at younger ages than those from two biological parent families. This is consistent with prior work on adolescent living

arrangements and the timing of first union formation (Ryan et al., 2009; Cavanagh, Crissey & Raley, 2008; Glick et al., 2006; Wolfinger, 2003; Teachman, 2003a, 2004; Michael & Tuma, 1985). However, unlike Teachman's (2003a) findings, parental marital status is not significantly related to the rate of first union formation. Individuals from blended families had the highest rate of first co-residential union formation and those from two biological parent families had the lowest rate. There are similar results for blended families using the weighted wave 1 data (analytic sample 2), which suggests that this finding is robust. The rate of first union formation for individuals from stepfamilies was similar to that of blended families and the risk for those from single mother families was closer to two biological parent families. This is generally consistent with Teachman's (2003a) work. Socioeconomic and demographic controls partially mediate the differences between each of these family types and two biological parent families.

I also find that the difference in the rates of union formation between blended and two biological parent and blended and single mother families are due in part to differences in SES and demographic characteristics (Manning & Lamb, 2003; Brown, 2006). As was anticipated, higher SES delayed the formation of first unions. Like Uecker and Stokes (2008) and Teachman, (2003a), I find that women have higher risks of forming co-residential unions than men and minorities have lower risks of forming first unions than non-Hispanic whites. The fact that these controls do not mediate the difference between blended and stepfamilies indicate that other factors are responsible for the difference between the two types of families.

The competing risk models for cohabitation and marriage showed that adolescent family structure is associated with the type of unions formed in adulthood. Compared to young adults from two biological parent families, respondents from all non-traditional families have higher risks of forming first unions through cohabitation. Several studies have similar findings

(Thornton, 1991; Axnin &Thornton, 1993; Teachman, 2003a; Teachman, 2004; Ryan et al., 2009). Growing up in blended families makes the risk of cohabitation significantly greater than single mother, and two biological parent families, but not stepfamilies. This suggests that blended and stepfamilies are more similar to each other than to two biological parent (and single mother) families. Unexpectedly, I find that having cohabiting parents is not significantly related to a respondent's risk of forming a cohabiting union. However, given the growing prevalence of cohabitation, growing up in a cohabiting family may not matter so much for cohabitation (Bumpass & Lu, 2000).

Contrary to expectations, this study finds that only individuals from blended families have significantly higher marriage rates compared to two biological parent families and stepfamilies. This is surprising because Teachman (2003a) finds that, compared to individuals from two biological parent families, individuals from married stepfamilies had significantly higher rates of marriage. A potential explanation is that what was observed as an effect of married stepfamilies may actually be that of blended families; these families were not distinguished from stepfamilies in prior research. Consistent with the literature, I find that individuals from stepfamilies are no different from those in two biological parent and single mother families (Axinn & Thornton, 1993; Thornton, 1991). Additionally, growing up in a cohabiting parent or single mother family vs. two biological parent families significantly reduces marriage rates (Teachman, 2003a; Ryan et al., 2009).

The high cohabitation rates and the predisposition to marry by young adults from blended families is not explained by socioeconomic and demographic differences. These controls reduce the risk of cohabitation between blended families and two biological parent families and blended families and single mother families. The effect of the controls on the risk of marriage varied by

family structure. Controlling for socioeconomic and demographic differences reduces the difference between two-parent families and single mother families but increases the difference between blended and the other two-parent families. These results are typical of blended family research where economic and demographic characteristics fail to explain the differences between blended and two biological parent families (Halpern-Meekin & Tach, 2008; Ginther & Pollak, 2004; Strow & Strow, 2008; Gennetian, 2005). Overall, these results suggest that while socioeconomic and demographic differences account for some of these aforementioned differences in first union formation, particularly cohabitation, other factors may account for the pattern seen in blended families.

Fourth, I re-estimated the Cox regression models, including sibling relationship quality and mother-child relationship quality measures to evaluate whether the effect of family structure on first union formation can be explained by sibling relationship quality. Sibling relationship quality includes sibling affection, sibling conflict and perception of parental preferential treatment. Overall, the results indicate that sibling relationship quality matters, but may not account for the differences in the pattern of first union formation between blended and two biological parent families. Inconsistent with expectations, neither sibling relationship quality nor mother-child relationship quality is important for the rate of first union formation (though the direction of the coefficients are as anticipated). However, the perception of these relationships are related to the risk of cohabitation and marriage. In the cohabitation models, although sibling affection and conflict are not associated with cohabitation rates, perceived unequal treatment by parents and poor mother-child relationship quality both increase the risk of cohabitation. The mother-child relationship quality coefficient decreases in size when parental preferential treatment is added to the model, which suggests that parental preferential treatment is one way in

which negative mother-child relationships is expressed. In the marriage models, sibling relationship quality is positively related to the risk of marriage. Specifically, sibling affection increases marriage rates for blended families (vs. two biological parent families). Mother-child relationship quality and parental preferential treatment are not important for marriage.

Contributions

This dissertation contributes to the literature and our understanding of blended families in four ways. First, it provides improved measures of family structure (that reduce misclassification) by using multiple-source reports, and produces nationally representative estimates of cohabiting and married blended families. This is significant because improvements in the measurement of family structure ensure that the literature remains relevant to the actual experiences of families (Bumpass, Raley, & Sweet, 1995). Previous studies have examined blended family structure but this is the first study to take into account the effect of family boundary ambiguity on the measurement of blended families. While previous research recognize that the half sibling relationship is the key to identifying blended families, this recognition is not enough to prevent misclassification. This research shows that family boundary ambiguity affects approximately 9% and 57% of married and cohabiting blended family sibling reports, respectively. This study therefore highlights the problems with using only half sibling reports for the identification of blended families. The fact that the pattern of family boundary ambiguity in sibling pair reports mirror that of Brown and Manning's (2009) mother-child reports suggests that these findings are robust and as such must be taken into account in future research. The study also adds to the literature by distinguishing cohabiting from married blended families, which had not been done in prior research. The study informs future research by finding that

cohabiting blended families have less favorable socioeconomic characteristics than married blended families but they are not the same as cohabiting stepfamilies.

Second, the literature on blended families has been limited to cognitive and behavioral outcomes measured in childhood and early adolescence. This study expands blended family literature to include adult union formation. Overall, the results confirm that blended families do not have the advantages that individuals from two biological families have. They form their first co-residential unions at younger ages and have the highest rates of cohabitation and marriage. This study contributes to the literature by finding that blended family offspring are not disadvantaged in the same way as stepfamilies. For example, living in blended families is (positively) related to marriage rates but living in married stepfamilies is not. This result supports the idea that unexplained heterogeneity in family structure may confound research findings. That is, distinguishing blended from stepfamilies shows that it is individuals who grow up in blended families who have elevated rates of marriage, not individuals from married stepfamilies. It is also reflective of differences in institutionalization that affect family relationships. This study contributes to scholarship by indicating that incomplete institutionalization may be linked to the differences in the pattern of union formation across family structure through variations in family relationships.

The third contribution of this dissertation is that it establishes a direct link between blended families and sibling relationship quality. Few studies that examine sibling relationship quality include family structure and those that do treat it as a control variable or moderator. This study provides future researchers with evidence that blended family members are "in-betweeners," occupying a space between two biological parent and stepfamilies. Siblings from blended families are more engaged (express more affection and conflict) with each other than

those in stepfamilies, but not as engaged as those in two biological families. Future researchers will recognize that parents and children in blended families appear to emphasize positive sibling relationships while two biological parent families and stepfamilies with full siblings may not feel the need to do the same because there are well-articulated rules for sibling behavior. Mothers in single parent families may hold the same views as parents in two biological parent families but siblings may have more conflicts in the period of adjustment following a divorce. This set of findings therefore adds to the literature by supporting the idea that there are variations in the level of institutionalization of family types. Genetic relatedness and socio-cultural norms that guide the formation of non-genetic relationships such as marriage may regulate the level of institutionalization.

Fourth, this dissertation contributes to the existing research by exploring how sibling relationship quality mediates the relationship between blended family structure and union formation. Previous researchers have been unable to explain the disadvantage of children in blended families (relative to two-biological parent families). This study adds to the literature by offering a possible explanation for this disadvantage based on the interplay among mother-child relationship quality, sibling relationship quality, and union formation. My findings indicate that sibling and mother-child relationship quality play a role in explaining the link between family structure and the type of first union respondents form but not the time that they take to form one. With respect to the former finding, the study suggests the following: (1) siblings' perceived unequal treatment by parents and poor mother-child relationship quality increases cohabitation rates but neither is related to marriage. Sibling affection and conflict are not related to cohabitation; (2) poor mother-child relationship quality increases sibling conflict and the

perception of unfair treatment, and it decreases affection; and (3) sibling affection is positively related to marriage rates.

I posit that these three findings suggests the following mechanism that can be explored in future research. On the one hand, individuals with poor relationships with their mothers also have poor sibling relationship quality, both of which motivate adolescents to leave their unsatisfactory home life by forming (or sliding into) unstable cohabiting unions. On the other hand, individuals with good sibling relationships may have interpersonal skills that improve their abilities to form stable relationships through marriage. This mechanism is also supported by prior research which find the following: (1) adolescents with negative family relationships experience more alienation from their families, greater dependence on peer groups, early home leaving, and union formation (Hetherington & Jodl, 1994); and (2) positive sibling relationships are linked to better interpersonal skills and stable romantic relationships (Updegraff et al., 2005; Kramer & Bank, 2005; Conger et al., 2000).

While children in two biological parent families have the characteristics that are associated with the formation of stable relationships, this does not hold true for other family types. In non-two biological parent families, which typically have fewer socioeconomic resources, poor mother-child relationships, and unequal parental treatment – adolescents are more likely to form early cohabitating unions. However, I find that children from blended families have higher rates of marriage than two biological parent families. My explanation for this, which adds to our body of knowledge on blended families, is that positive sibling relationships in these family types may increase marriage rates because parents may feel that they have to clearly define sibling relationships and encourage positive sibling interaction in a context where there is less institutional support for half-sibling relationships (vs. full siblings).

Limitations

There are several notable limitations of this study. The first is the inadequate measurement of sibling relationship quality. Non-systematic measurement of sibling relationship measures by Add Health made it difficult to obtain the measures for each pair of half-siblings that are necessary to conduct the within-family analysis. Consequently, I was unable to conduct pairwise analyses of sibling relationship quality, which may have provided better insight into the way these relationships vary by family structure. Additionally, the pattern of marriage and cohabitation may vary with within-sibling pair differences in sibling relationship quality. Restricting the families to only those with two children potentially reduces the impact of multiple sibling relationships on first union formation.

The second limitation is that despite unpacking some of the complexity in the measurement of family structure by including cohabiting blended families a considerable amount of heterogeneity remains. The single mother and stepfamily categories still contain families that not only differ in their composition, but also in their processes. For instance, single mother families with half-siblings may have different consequences for child well-being than a single mother family with full siblings. Similarly, stepfamilies where both partners bring children from previous relationships into the household (i.e., *The Brady Bunch*) may also be substantively different from stepfamilies in which only one partner has children in the household. Excluding these families may have masked important links between family structure, sibling relationship quality, and first co-residential union formation.

The third limitation is that the analysis of the relationship between family structure and sibling relationship quality was cross-sectional because I was unable to measure changes in sibling relationship over time. Sibling relationships change over time (White & Riedmann, 1992;

Conger & Little, 2010), so it would be useful to know if the effect is constant as the findings here suggest, or whether they increase or decrease over time. Add Health measured sibling relationship quality at waves 1, 2, and 3. Unfortunately, there is insufficient variation between waves 1 (1995) and 2 (1996), and the wording of items are different at wave 3. Changes in the wording of items across waves introduces variation in sibling relationship quality that is an artifact of changes in wording rather than actual change in sibling relationship quality over time. Therefore, changes in wording could be confounded with the effect of family structure.

The fourth limitation is that the included predictors did not fully account for the differences between blended and the other family structures. Other covariates, particularly stepfather-stepchild relationships, may be instrumental in understanding the differences between blended families and stepfamilies. A few studies suggest that stepfathers are part of the reason that children are disadvantaged in blended families (Hofferth, 2006). Stepfathers do not invest enough time and money to decrease the gap between their children and children in two biological parent families. Add Health has measures of father-child relationship quality but response rates are not as good as mother child-measures. I excluded these items because of concerns about cell sizes.

The fifth limitation is that I did not control for selection into family structure. It is possible that specific types of people are more likely to form blended families and have children that have a predisposition to marriage. I did not control for selection for two reasons. First, the available measures (parental smoking and drinking) are not suitable for this study. Second, these items are from the parent questionnaire, so including them would have reduced cell sizes.

Summary

A key factor for understanding how blended families shape child well-being is sibling relationship quality. Although sibling relationship quality does not fully account for the difference between blended and two biological parent families, it does provide a link between blended families and first union formation. Parents in blended families appear to encourage positive sibling relationship quality, which increases children's marriage rates relative to two biological parent families. Poor sibling relationship and mother-child relationship quality increase cohabitation rates. Improving the measurement of blended families is a critical way in which this study contributes to understanding blended families. Distinguishing cohabiting blended families from married blended families and reducing the effects of family boundary ambiguity adds two dimensions to the blended family literature that future research should continue to develop.

Future research should consider the following ways to close the gap between blended and two biological parent families. First, researchers should examine mutual sibling relationship quality reports of half-siblings to get a better understanding of the ways in which sibling relationships affect blended family processes and shape child well-being. Second, consideration should be given to modelling sibling relationship quality as a time varying covariate to examine how the changes in sibling relationships over time vary with family structure and first union formation. Third, researchers should use data with measures of stepparent-stepchild relationship quality and other measures that effectively control for selection into specific families and the transmission of specific co-residential union types. Fourth, perhaps the best way to improve our understanding of blended families is to improve the measurement of family structure. The

addition of interviewer assessments of family structure to omnibus surveys may be an important next step.

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APPENDIX A

Date	Author(s)	data	Family Structure	Outcome(s)	Findings
Two biological parent vs. Non-two biological parent					
1969	Duncan & Duncan	CPS	Two biological parent (ref) and single-mother families	Occupational attainment	Children from single-mother families have lower occupational attainment
1985	McLanahan	PSID	Two biological parent (ref) and single-mother families	Educational attainment	Children from single-mother families have lower educational attainment
1988	McLanahan	PSID	Two biological parent (ref) and single-mother families	Form single parent families and welfare use	Women from single-mother families are more likely to form single parent families and use welfare
1991	Astone & McLanahan	HSB	Two biological parent (ref), married stepfamily, single parent family and other family	Parenting behavior and educational outcomes	Children from single parent and stepfamilies receive poor parenting have poor educational outcomes
Marriage vs. Cohabitation					
1996	Manning & Lichter	PUMS	Married (ref), cohabiting, and single parent families	Economic well-being (income-to-poverty ratio)	Having a cohabiting partner increased children's economic well-being but they remained worse than children from married families
1997	Manning & Smock	PUMS	Cohabiting, nonfamilies, single-mother, and extended families	Child poverty	Having an unmarried partner and/or other adults in the household increased child poverty rates
2003	Manning & Lamb	ADD Health	Two biological parent (ref), single mother, cohabiting (ref) and married stepfather families	GPA, delinquency, suspension/expulsion, school problems, PPVT and college expectations	Children from two biological parent families have better well-being than children from all other types Compared to children from cohabiting stepfamilies, children from married stepfamilies have better well-being; this difference however is explained by differences in parenting and economic resources
2006	Manning & Brown	NSAF	Two biological parent (ref), married step-, cohabiting biological, cohabiting step-, and single parent	Economic well-being	Children from two biological parent families have better economic well-being than children from all other types There was no difference between cohabiting bio and stepfamilies The differences between married and cohabiting stepfamilies are explained by child and parent characteristics
2004	Brown	NSAF	Two biological parent (ref), married step-, cohabiting biological, cohabiting step-, single parent and no parent families	Behavioral and emotional problems and school engagement	Children from two biological parent families have better well-being than children from all other types. For cohabiting bio and step families parent's resources explains the difference compared to two biological parent families but only for children not adolescents.
2006	Brown	ADD Health	Two biological parent (ref), married step-, cohabiting step- and single-mother families (all stable)	Delinquency, depression, and school engagement	Children from two biological parent families have better well-being than children from all other types Net of controls children from cohabiting stepfamilies had lower well-being than children from married stepfamilies
2009	Brown & Manning	ADD Health	Two biological parent (ref), married stepparent, cohabiting stepparent, and single-mother families	Family boundary ambiguity and family processes: mother-child closeness, family connectedness and autonomy	Two biological parent families have better quality family processes than all other family types Cohabiting stepfamilies have lower levels of closeness, connectedness and autonomy than two biological parent families

APPENDIX B

Table A: Omitted Group Comparisons for Affection and Conflict for Analytic Sample 1 (N=1,651

	Affection			Conflict	
	Omitted Group				
Family structure	Two-biological parent	Blended	Step	Two-biological parent	Blended
Two-biological-parent families	-	-0.16	0.29*	-	0.19
Stepfamilies	-0.29*	-0.45**	-	-0.05	0.14
Blended	0.16	-	0.45**	-0.19	-
Single mother families	-0.01	-0.17	0.28*	0.02	0.21
Other families	0.10	-0.07	0.38	-0.01	0.19
Cohabitation flag	0.22	0.22	0.22	-0.01	-0.01

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Add Health wave 1 (weighted). All controls are included in the models.

Table B: Supplemental Analyses Examining the Effect of Single Mother Families of Sibling Relationship Quality (N = 3,481)

	Model					
Variables	Affection			Conflict		
Family structure (Blended families)	1	2	3	1	2	3
Two-biological-parent families	0.03	0.04	0.01	-0.00	-0.00	0.05
Stepfamilies	-0.24	-0.24	-0.24	-0.04	-0.04	-0.02
Single mother and full siblings	0.20	0.21	-0.03	0.28*	0.28*	0.40**
Single mother and half-siblings	0.07	0.08	-0.30	0.03	0.03	0.21
Single mother and stepsiblings	-0.60	-0.59	-0.18	0.27	0.27	-0.06
Single mother and mixed sibling type	0.26	0.27	0.07	-0.24	-0.24	-0.10
Other families	0.29	0.30	-0.05	-0.35	-0.36	-0.20
Cohabitation flag		0.08	-0.01		-0.00	0.03
Background characteristics						
Family socioeconomic status			0.02			-0.01
Female			0.74***			0.29***
Non-Hispanic black			0.85***			-0.48***
Hispanic			0.31**			-0.15
Other race/ethnicity			0.20*			-0.20*
Respondent age (wave 1)			0.08***			-0.08***
Log likelihood	-4643.95	-4643.89	-4521.14	-5148.06	-5148.06	-5112.10
LR Chi-square	17.72**	17.85**	263.34***	16.12*	16.12*	88.05***
Pseudo R^2	0.002	0.002	0.028	0.002	0.001	0.009

Table C1: Family Structure and the Risk of any First Union Formation (N= 5,145)

	Omitted Group					
Variables	Two-biological-parent		Blended		Step	
Family structure	Hazard		Hazard		Hazard	
Two-biological-parent families	-		0.69	***	0.72	***
Stepfamilies	1.39	***	0.96		-	
Blended families	1.45	***	-		1.04	
Single mother families	1.26	***	0.87		0.91	
Other families	1.32		0.91		0.95	
Cohabitation flag	0.93		0.93		0.93	

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Add Health wave 1 (weighted). Models adjusted for left truncation. Socio-demographic controls are included in all models. Two hundred and fourteen cases did not have wave 1 weight information.

Table C2: Family Structure and the Risk of any First Union Formation (N= 5,359)

	Omitted Group					
Variables	Two-biological-parent		Blended		Step	
Family structure	Hazard		Hazard		Hazard	
Two-biological-parent families	-		0.69	***	0.66	***
Stepfamilies	1.39	***	1.05		-	
Blended families	1.45	***	-		0.96	
Single mother families	1.26	***	0.81	***	0.77	***
Other families	1.32	***	1.01		0.96	
Cohabitation flag	0.93		0.84		0.84	

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Add Health wave 1 (unweighted). Models adjusted for left truncation. Socio-demographic controls are included in all models.

Table D1: Family Structure and the Competing Risks of First Cohabitation and Marriage Formation (N =5,145)

	Cohabitation						Marriage					
	Model						Model					
Variables	**1**		**2**		**3**		**1**		**2**		**3**	
Family structure	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**
(Two-biological-parent)												
Stepfamilies	0.37 ***	1.45	0.37 ***	1.45	0.36 ***	1.44	0.01	1.01	0.15	1.17	0.19	1.21
Blended families	0.47 ***	1.60	0.47 ***	1.60	0.41 ***	1.51	0.14	1.15	0.23	1.25	0.19	1.21
Single mother families	0.33 ***	1.39	0.33 ***	1.39	0.33 ***	1.39	-0.29 *	0.75	-0.29 *	0.75	-0.27 *	0.76
Other families	0.35 *	1.42	0.35 *	1.42	0.41 *	1.50	-0.84	0.43	-0.84	0.43	-0.63	0.53
Cohabitation flag			0.01	1.01	0.03	1.04			-0.99 *	0.37	-0.98 *	0.38
Background characteristics												
Family socioeconomic status					-0.07 ***	0.94					-0.06 **	0.94
Female					0.29 ***	1.34					0.50 ***	1.65
Non-Hispanic black					-0.35 ***	0.71					-0.65 ***	0.52
Hispanic					-0.33 *	0.72					0.15	1.16
Other race/ethnicity					-0.35 ***	0.71					-0.15	0.86
Respondent age (wave 1)					-0.05 **	0.95					0.06	1.07
N of events	**3,633**						**825**					

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Add Health wave 1 (weighted). Models are adjusted for left truncation. Reference categories are in brackets.

Table D2: Family Structure and the Competing Risks of First Cohabitation and Marriage Formation (N =5,359)

	Cohabitation						Marriage					
	Model						Model					
Variables	**1**		**2**		**3**		**1**		**2**		**3**	
Family structure	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**	**b**	**Hazard**
(Two-biological-parent)												
Stepfamilies	0.44 ***	1.55	0.45 ***	1.57	0.44 ***	1.55	0.17 ***	1.18	0.27 *	1.31	0.33 **	1.39
Blended families	0.44 ***	1.56	0.45 ***	1.57	0.41 ***	1.50	0.15 ***	1.16	0.22	1.25	0.23	1.26
Single mother families	0.26 ***	1.29	0.26 ***	1.29	0.24 ***	1.27	-0.31 ***	0.74	-0.31 **	0.73	-0.25 *	0.78
Other families	0.48 ***	1.62	0.48 ***	1.62	0.48 ***	1.61	-0.27 ***	0.77	-0.27	0.77	-0.14	0.87
Cohabitation flag			-0.07	0.93	-0.09	0.92			-0.64 *	0.53	-0.67 *	0.51
Background characteristics												
Family socioeconomic status					-0.06 ***	0.94					-0.08 ***	0.93
Female					0.26 ***	1.30					0.52 ***	1.69
Non-Hispanic black					-0.31 ***	0.74					-0.77 ***	0.46
Hispanic					-0.30 ***	0.74					-0.12	0.89
Other race/ethnicity					-0.39 ***	0.68					-0.24 **	0.79
Respondent age (wave 1)					-0.04 ***	0.96					0.08 ***	1.08
N of events	**3,633**						**825**					

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Add Health wave 1 (unweighted). Models are adjusted for left truncation. Reference categories are in brackets.

Table E: Family Structure and the Risk of First Union Formation (N = 1,453)

Any First Union Formation	Omitted Group					
Variables	Two-biological-parent		Blended		Step-	
Family structure	Hazard		Hazard		Hazard	
Two-biological-parent families			0.672	**	0.632	***
Stepfamilies	1.581	***	1.063			
Blended families	1.487	**			0.94	
Single mother families	1.199	*	0.806		0.758	*
Other families	1.422	*	0.956		0.899	
Cohabitation flag	0.753		0.753		0.753	
Competing risk: First Cohabitation						
Two-biological-parent families			0.662	**	0.632	***
Stepfamilies	1.581	***	1.046			
Blended families	1.512	**			0.956	
Single mother families	1.248	**	0.826		0.789	
Other families	1.423	*	0.941		0.9	
Cohabitation flag	0.744		0.744		0.744	
Competing risk: First Marriage						
Two-biological-parent families			0.738		0.622	*
Stepfamilies	1.607	*	1.187			
Blended families	1.354				0.843	
Single mother families	1.006		0.743		0.626	
Other families	1.431		1.057		0.89	
Cohabitation flag	0.783		0.783		0.783	
N of events	**1,201**		**965**		**236**	

*p≤0.05; **p≤0.01; ***p≤0.001

Notes: Add Health wave 1 (unweighted). Models are adjusted for left truncation and include socio-demographic, parent investment, and sibling relationship controls.