THE ASSOCIATION BETWEEN SIBLING TYPE, SIBLING RELATIONSHIP QUALITY, AND MENTAL HEALTH FROM ADOLESCENCE INTO YOUNG ADULTHOOD

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ABSTRACT

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The majority of Americans have siblings, who provide one another with warmth, support, and friendship, and also serve as a source of conflict, throughout the life course. Past research shows that sibling relationship quality influences mental health and self-concept. Over the past several decades, as more parents break up and re-partner, a substantial proportion of America's youth grow up with half-siblings or step-siblings. Limited research has examined how sibling relationship quality with half-siblings or step-siblings differs from those with full-siblings, however.

Using Waves II and III of the National Longitudinal Study of Adolescent to Adult Health, drawing from the core sample (N = 8,402) and the residential sibling pairs sample (N = 1,753), this dissertation examines the following three questions : (1) Does residential sibling relationship quality in adolescence, measured as feelings of love, fights, and time spent together, vary across full-siblings, half-siblings, and step-siblings, controlling for variation by sibling type in family characteristics, such as mother-child relationship quality, father-child relationship quality, and family belonging? (2) Does sibling relationship quality in young adulthood, measured as visits, phone calls, help-seeking, fights, and emotional closeness, vary by sibling type, controlling for sibling relationship quality during adolescence? (3) Does the association between relationship quality with residential siblings in adolescence and mental health and self-concept in young adulthood differ across the three residential sibling types?

The findings suggest that among residential siblings, with the same family characteristics, relationships with step-siblings are more distant than those with full-siblings or half-siblings, while relationships with half-siblings are similar to those with full-siblings, both in adolescence

and young adulthood. Emotionally close relationships and fights with siblings in adolescence are associated with better self-esteem and fewer depressive symptoms in young adulthood, with variation by sibling type in ways that are more complex than predicted based on the "stepfamily as incomplete institution" perspective. Fights indicate closer, rather than more distant, sibling relationships. Overall, the findings contribute to the existing bodies of family, sibling, and mental health research, suggesting the merit to further investigating differences in the nature of full-siblings, half-siblings, and step-siblings and their implications for individual well-being across different life stages.

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CHAPTER I. INTRODUCTION

Sibling relationships are considered distinctive from other close relationships, due to their general endurance, egalitarian status, and shared family history (McHale et al., 2013; White, 2001). Sibling relationships can provide warmth, closeness (Buist et al., 2013; Noller, 2005), support, love, or friendship (Noller, 2005; Van Volkom et al., 2011), or serve as a source of conflict (Buist et al., 2013; Milvesky et al., 2005; Noller, 2005), throughout the life course. Given its endurance, it is no surprise that sibling relationship quality matters for the well-being of individuals across different life stages. Past research has found that closeness between siblings is generally associated with better mental health and less externalizing problems in adolescence (Buist et al., 2013), and better mental health in young adulthood (Milevsky, 2005; Sherman et al., 2006), though many of these studies are cross-sectional and rely on convenience samples from local areas. Further, research that considers sibling relationships generally limit their samples to full-siblings only, or if sibling type is included, half-siblings and step-siblings are grouped together as if they are one and the same. Overall, there is limited research that considers variations in sibling relationships by sibling type.

In recent decades, parental relationship instability has led to a rise in complex families or families with children who have half-siblings or step-siblings (Brown et al., 2015; Manning et al., 2014). For example, in 2009, 57.7 million children, or 78% of children were living with at least one sibling, and 14% of children were living with at least one adopted, half-, or step-sibling, according to the Current Population Survey (Kreider & Ellis, 2011). Researchers have begun to investigate how growing up with half-siblings or step-siblings influences the well-being of adolescents (Brown et al., 2015; King et al., 2018). These studies have suggested that having half-siblings is distinct from having only full-siblings or from having step-siblings when it comes

to adolescent well-being (Cooksey & Fondell, 1996; Halpern-Meekin & Tach, 2008; Hofferth, 2006). Given that, as mentioned earlier, closeness between siblings and support from siblings are associated with better mental health and less externalizing problems during adolescence and young adulthood (Buist et al., 2013; Milevsky, 2005), and sibling type matters for children's adjustment (Richmond et al., 2005), variation in sibling relationship quality by sibling type—full-, half-, or step- siblings—may be the key to understanding such variation in adolescent well-being by sibling type. Limited research has considered the quality of sibling relationships by sibling type due to a lack of data, particularly national data, that considers siblings and relationship quality, and includes sibling type.

To fill in this gap in prior knowledge, in this dissertation, I examine variations in sibling relationship quality across three sibling types—full-siblings, half-siblings, and step-siblings—in adolescence and young adulthood and its influences on the well-being of young adults. I ask three sets of research questions: (1) Does sibling relationship quality in adolescence vary by respondent's type of residential siblings? Does it vary even after controlling for variation in family characteristics by respondent's type of siblings? (2) Does sibling relationship quality in young adulthood vary by sibling type? Does it vary even after controlling for sibling relationship quality during adolescence? (3) Does the association between sibling relationship quality in adolescence and mental health and self-concept in young adulthood differ across the three sibling types?

Sibling Relationship Quality in Adolescence: The Effects of Sibling Type and Family Characteristics

The first goal (Chapter II) is to examine the association between respondent's type of residential siblings – respondent only has full-siblings, respondent has half- siblings (but not

step-siblings), and respondent has step-siblings - and three aspects of sibling relationship quality — feelings of love, time spent together, and fights—in adolescence, using the core sample from the National Longitudinal of Adolescent to Adult Health (Add Health), Wave II. Drawing on the stepfamilies as an incomplete institution perspective (Cherlin, 1978) and family systems theory (Broderick, 1993; Gilligan et al., 2020), I focus on the role of family characteristics (residential mother type, residential father type, mother-child relationship quality, father-child relationship quality, and family belonging,) as key factors influencing differences in sibling relationship quality by respondent's residential sibling type. The stepfamilies as an incomplete institution perspective argues that relationships among stepfamily members are both complex and challenging because they lack institutionalized norms, expectations, behaviors, and language to guide their interactions with each other. For instance, while traditional nuclear families can generally assume they will spend the holidays and other special occasions together, more complex families likely have to navigate custody and visitation schedules. The lack of clearly defined roles and expectations among step-siblings may lead to more conflict and less warmth than full-sibling relationships (Vogt Yuan, 2009). While half-siblings who share only one biological parent also tend to experience an incomplete institution, they arguably experience greater institutionalization than step-siblings, who do not share a biological parent. Further, half-siblings share some of the same biological ties and kinship language (e.g., aunt, uncle, grandmother), and are expected to maintain a lifelong relationship regardless of their parents' relationship status. There is also a chance that one of the children is living with two biological parents with half-siblings, but not with step-siblings (Manning et al., 2014).

The stepfamilies as an incomplete institution perspective seemingly argues that family characteristics are the key to understanding poor sibling relationship among half-siblings and

step-siblings compared to full-siblings. This argument suggests that half-sibling and step-sibling relationships characterized by less ambiguity and close relationships among family members within step- or blended families may be related to better sibling relationship quality. Further, family systems theory highlights the interconnectedness between family members (e.g. Broderick, 1993; Buehler, 2020; Gilligan et al., 2020; King, Boyd, & Thorsen, 2015), based on the assumption that "all parts of a family system are interconnected with each subsystem (e.g., mother-child) affecting all other subsystems" (e.g., full-, half-, and step- siblings) (King & Lindstrom, 2016). Therefore, I consider the role of family characteristics as primary control measures, focusing on residential mother type, residential father type, mother-child relationship quality (Kim et al., 2006; Pike et al., 2005), father-child relationship quality (Kim et al., 2006), and family belonging (King et al., 2018; King, Boyd, & Thorsen, 2015).

In sum, in Chapter II, using the core sample from Wave II of Add Health (N = 8,402), I examined the association between respondent's type of residential siblings – respondent with only full-siblings, respondents with half-siblings (but not step-siblings), and respondents with step-siblings (who may also have full-siblings and half-siblings) – and sibling relationship quality – feelings of love, time spent together, and fights – in adolescence. Additionally, I focus on family characteristics – residential mother type, residential father type, mother-child relationship quality, father-child relationship quality, and family belonging – as primary control measures.

Sibling Relationship Quality in Young Adulthood: The Effects of Sibling Type and Adolescent Relationship Quality

In Chapter III, turning to young adulthood, I examine the influence of sibling type on five aspects of sibling relationship quality (visits, calls and emails, emotional closeness, help seeking,

and fights), using the core and sibling pairs samples from Wave II and Wave III of Add Health. I focus on the role of sibling relationship quality in adolescence as primary control measures.

Past research has examined the difference in sibling relationships across the life course (e.g., Spitze & Trent, 2018; White, 2001), but most of this research is largely centered on childhood and adolescence (e.g., Buist et al., 2013) or mid- to later life (e.g., Connidis & Campbell, 1995), rather than young adulthood. Young adulthood is an important time in the life course to consider, as this is the time when many siblings begin to live apart and to establish their independence from their families. Additionally, siblings can provide friendship, support, love (Van Volkom et al., 2011), and advice (Dolgin & Lindsay, 1999) for one another, and closeness between siblings can lead to better mental health (Milevsky, 2005; Sherman et al., 2006). However, the majority of the studies that have considered sibling relationships in young adulthood have relied on convenience samples of college students and young adults in the surrounding area (e.g., Milevsky et al., 2005; Sherman et al., 2006; Van Volkom et al., 2011) making it unclear to what extent these findings can be generalizable.

Again, the stepfamilies as an incomplete institution perspective (Cherlin, 1978) highlights that within stepfamilies, behaviors and interactions between family members can be particularly complex and challenging due to a lack of familial norms, expectations, legal guidelines with regard to parental rights, and agreed upon universal language to refer to one another. The lack of clearly defined roles and other obstacles that stepfamilies face, may influence less close and more conflictual relationships between step-siblings (Vogt Yuan, 2009). Arguably families that include half-siblings still experience an incomplete institution, although compared to step-siblings it is likely they have more clearly defined roles and expectations. While step-siblings' ties heavily rely on the parents, half-siblings share a lifelong genetic tie and share some of the

same biological connections and kinship language (e.g., father, grandmother). Further, unlike step-siblings, some individuals with half-siblings also grew up living with both of their biological parents (Manning et al., 2014). Therefore, residential half-siblings would report better relationship quality than residential step-siblings, but not residential full-siblings.

Alternatively, the life course perspective (Elder, 1994) and continuity theory (Fowler, 2009) both emphasize the importance of early life experiences in shaping later life stages, suggesting that sibling relationship quality in young adulthood may depend more on sibling relationship quality in adolescence than sibling type. Prior research has found more continuity than change when examining sibling relationship quality (Guan & Fuligni, 2015; Lindell & Campione-Barr, 2017). Thus, drawing on the life course perspective and continuity theory, I examine the influence of sibling relationship quality in adolescence on the association between sibling type and sibling relationship quality in young adulthood.

In sum, in Chapter III, using the core and sibling pairs samples from Wave II and Wave III of Add Health, I examine the association between sibling type –full-, half-, and step- – and sibling relationship quality – visits, calls and emails, emotional closeness, help seeking, and conflict – in young adulthood. Moreover, I focus on sibling relationship quality – feelings of love, time spent together, and fights – in adolescence as primary control measures.

Sibling Relationship Quality, Mental Health, and Self-Concept: The Effect of Sibling Type

Finally, in Chapter IV, using the core and sibling pairs samples from Wave II and Wave III of Add Health, I examine variation in the association between sibling relationship quality in adolescence and reports of depression and self-esteem in young adulthood by sibling type. Young adulthood can be a particularly stressful time in the life course due to the many changes and transitions that generally occur, such as leaving one's household of origin, going away to

college, starting a career, entering romantic relationships, and becoming a parent (Conger & Little, 2010). Also, individuals tend to more fully develop and explore their identities and independence in young adulthood (Arnett, 2000). Given the number of stressful changes and events that may occur during this stage in the life course, an individual's mental health and self-concept may be particularly vulnerable. Having emotional support from close relationships can help individuals deal with stressful situations (e.g., Thoits, 2011; Umberson & Montez, 2010). Some research has found that sibling relationship quality influences mental health and self-concept in young adulthood (e.g., Milevsky, 2005; Sherman et al., 2006). Yet, these studies largely rely on cross-sectional data from convenience samples of college students and non-college students in the local area, though several locally based studies have used longitudinal data (e.g., Finan et al., 2018; Guan & Fuligni, 2015) finding that sibling relationship quality in adolescence does influence reports of depressive symptoms (Finan et al., 2018; Guan & Fuligni, 2015; Petit et al., 2011) and self-esteem (Guan & Fuligni, 2015) in young adulthood.

To extend upon this line of research, I examine the association between sibling relationship quality in adolescence and reports of depression and self-esteem in young adulthood using longitudinal data of a more diverse national sample. I am specifically interested in whether the benefit of close sibling relationships for reports of depression and self-esteem vary by sibling type (i.e., full-, half-, and step- siblings). I would argue that the idea of stepfamily as an incomplete institution leads to two contrasting predictions. On one hand, when assuming the security and attachment that generally comes with institutionalized norms, behaviors, and guidelines – positive relationship quality in adolescence will significantly bolster self-esteem and decrease reports of depressive symptoms in young adulthood, more so for full-siblings, than half-siblings or step-siblings. On the other hand, despite a lack of institutional norms and guidelines,

families with half-siblings and step-siblings can adapt to their new family roles, form secure attachments, and develop warm, quality relationships over time, (Bray, 1999; Vogt Yuan, 2009). Because of the lack of institutionalized norms and obligations that would work as the basis of sibling ties, affectional bonds may matter more for the well-being of half-siblings and step-siblings than for the well-being of full-siblings. Thus, spending time together and emotional closeness in adolescence may actually be more beneficial for mental health (decrease depressive symptoms) and self-concept (bolster self-esteem) in young adulthood among half-siblings and step-siblings, than for full-siblings.

In sum, the goals of this dissertation include using the core and sibling pairs samples in Waves II and III of Add Health to examine the association between respondent's sibling type and sibling relationship quality in adolescence (Chapter II) and young adulthood (Chapter III), while considering primary control measures such as family characteristics (Chapter II) and earlier sibling relationship quality (Chapter III). Next, Chapter IV provides a longitudinal analysis of the influence of sibling relationship quality in adolescence on mental health and self-concept in young adulthood, while considering the influence of sibling type. Given the increasing prevalence of complex families that include half-siblings and step-siblings, these findings will help us understand the importance of sibling type – full-, half-, step- – in influencing sibling relationship quality, and in turn, mental health and self-concept.

CHAPTER II. SIBLING RELATIONSHIP QUALITY IN ADOLESCENCE: THE EFFECTS OF SIBLING TYPE AND FAMILY CHARACTERISTICS

Increases in parental relationship instability have resulted in the rise of stepfamilies, defined as families where at least one of the adults has a child or children from a previous relationship (Ganong & Coleman, 2017), and blended or complex families, defined as families with children who have half-siblings or step-siblings (Brown et al., 2015; Manning et al., 2014), in recent decades. According to the Current Population Survey (CPS), in 2009, 57.7 million children, or 78% of children, were living with at least one sibling; 64% of children were living with only full-siblings and 14% of children were living with at least one adopted sibling, half-sibling or step-sibling (Kreider & Ellis, 2011). Scholars have increasingly investigated implications of growing up in complex families for children's developmental outcomes (e.g., Brown et al., 2015; Hofferth, 2006; King et al., 2018; Manning et al., 2014).

Yet, research has not specifically focused on differences in the quality of sibling relationships across different sibling types—full-, half-, and step- – siblings. This is an important omission that needs to be addressed, as a significant number of youth are growing up with half-siblings and step-siblings (Kreider & Ellis, 2011). Sibling relationships are common and are one of the longest lasting relationships many individuals experience (McHale et al., 2013). Sibling relationships can serve as a source of warmth, closeness (Buist et al., 2013; Noller, 2005; Ripoll-Núñez, & Carillo, 2014), support, love, or friendship (Noller, 2005), or as a source of conflict (Buist et al., 2013; Noller, 2005; Ripoll-Núñez, & Carillo, 2014). Generally, past research finds that closeness between siblings is associated with better mental health (less internalizing problems) and less externalizing problems (e.g., Buist et al., 2013). Further, past research has found that there is a significant association between sibling context, such as birth order, and

children's adjustment (Richmond et al., 2005). Thus it is critical to identify factors related to sibling relationship quality in adolescence.

Drawing on past research on family complexity (e.g. Harcourt et al., 2015; Manning et al., 2014) and stepfamily dynamics (e.g. Anderson, 1999), this chapter used the core sample in Wave II of the National Longitudinal Study of Adolescent to Adult Health (Add Health; N = 8,402) to examine the following questions: (a) How do reports of sibling relationship quality among residential half-siblings or residential step-siblings differ from reports of relationship quality among residential full-siblings in adolescence? Do half-siblings or step-siblings report as much love for their sibling, time spent together, and fighting with one another as full-siblings? (b) Do differences in love for their sibling, levels of time together, and fights among siblings in adolescence by residential sibling type disappear when family characteristics (i.e., residential parent type, mother-child relationship quality, father-child relationship quality, family belonging) are controlled for?

Literature Review

Sibling Relationship Quality during Adolescence

Sibling relationships are complex and diverse, and, like other relationships among family members, multidimensional, including affective (love), associational (time spent together), and conflict aspects (Buist et al., 2013). Past studies focusing on siblings during adolescence have analyzed levels of sibling warmth, affection or closeness (e.g., Buhrmester & Furman, 1990; Gass et al., 2007), companionship, intimacy, (e.g. Burhmester & Furman, 1990), and conflict or rivalry (e.g., Buhrmester & Furman, 1990; Gass et al., 2007).

Past research has shown that sibling relationship quality is related to adolescent well-being (e.g., Buist et al., 2013; Kim et al., 2007). For example, a longitudinal study of families

recruited from a community sample of public schools in the western United States found that as sibling relationships improved (became warmer and less conflictual), adolescents experienced a decrease in depressive symptoms; in contrast as sibling relationships worsened (became less warm and more conflictual), adolescents became more depressed (Richmond et al., 2005). Another study targeted families with two adolescent children in one Midwestern state to consider the influence siblings have on each other's health attitudes and weight (Senguttuvan et al., 2014). The authors found that sibling intimacy was related to healthy attitudes and more exercise behaviors, while sibling conflict was related to increased risk of being overweight (Senguttuvan et al., 2014). A more recent study analyzed whether having a sibling and sibling relationship quality affected prosocial behaviors and best friend relationship quality among a sample of 310 children aged 8-11 (Smorti & Ponti, 2018). The authors found that simply having a sibling did not affect prosocial behaviors (e.g., altruism, trust, agreeableness) or best friend relationship quality, but *the better quality* of sibling relationships did have a positive effect on prosocial behaviors, which, in turn, positively influenced best friend relationship quality (Smorti & Ponti, 2018). Thus, it is important to identify factors that are related to sibling relationship quality, as sibling relationship quality does seem to affect the well-being of adolescents in terms of emotional or mental health, physical health behaviors, and prosocial behaviors.

The context surrounding the siblings is important when considering sibling relationship quality. Prior studies have found that characteristics of sibling compositions, such as gender (Buhrmester & Furman, 1990; Buist et al., 2013; Gass et al., 2007; Harcourt et al., 2015; Hofferth, 2006; Tillman, 2008), race/ethnicity (Harcourt et al., 2015; Halpern-Meekin & Tach, 2008; Hofferth, 2006; Tillman, 2008), age (Gass et al., 2007; Halpern-Meekin & Tach, 2008; Harcourt et al., 2015; Hofferth, 2006; Tillman, 2008), and birth order (Anderson, 1999;

Buhrmester & Furman, 1990; Halpern-Meekin & Tach, 2008), are related to sibling relationship quality. Therefore, the analyses in this chapter controlled for all of these characteristics.

Most of the past studies have exclusively focused on full-sibling relationships, despite the increases in the proportion of youth who grow up with half-siblings or step-siblings. Much research on stepfamilies and blended families has focused on the effects of family structure—residential mother and father types—or residential mother-child or residential father-child relationships (e.g., King et al., 2018; King, Boyd, & Thorsen, 2015; Sweeney 2010). There are a few indications that relationships with step-siblings or half-siblings may have distinct effects on adolescent well-being beyond the effects of family structure. For example, some of the studies that examined adolescent well-being have shown that half-siblings are distinct from either full-siblings or step-siblings. Among two-biological parent families, children who have half-siblings in the household are more likely than those who do not have half-siblings to demonstrate worse developmental outcomes (Halpern-Meekin & Tach, 2008). Among stepfamilies, however, children who have half-siblings appear to show better developmental outcomes than children who do not have half-siblings (Cooksey & Fondell, 1996; Hofferth, 2006). These findings suggest that sibling relationship quality may also vary across the three types of siblings—full-, half-, and step- –siblings.

Very few empirical studies have examined differences in sibling relationship quality by sibling type during adolescence. Focusing on adults, several studies have found that there are significant associations between sibling type and aspects of sibling relationship quality. White and Riedmann (1992) used a sample of adults eighteen and older, drawn from the National Survey of Families and Households (NSFH) 1987-88, and found that respondents maintain relationships with their siblings into adulthood, although they prioritized contact with full-

siblings over contact with half-siblings or step-siblings. Similarly, Mikkelson and colleagues (2011) performed a dual study among adults with siblings and generally found that the more genetically related siblings were, the more relationship maintenance behaviors they used with their siblings, thus full-siblings used the most relationship maintenance behaviors and step-siblings used the least.

This chapter examines how sibling type – full-, half-, or step- – is related to several aspects of sibling relationship quality during adolescence. In the following sections, using the stepfamilies as incomplete institution perspective (Cherlin, 1978), I first discuss how sibling types may influence sibling relationship quality. Then, drawing on the family systems theory (Broderick, 1993; Gilligan et al., 2020), I discuss some family characteristics that should be taken into account.

The Link Between Sibling Type and Relationship Quality

The stepfamilies as an incomplete institution perspective centers on the ambiguous status of siblings who do not share biological parents. Sociologists have argued that stepfamilies are an *incomplete institution* (Cherlin, 1978) and relationships among family members within stepfamilies are complex and also challenging, due to a lack of institutionalized norms, expectations, and language to guide their interactions with one another. For instance, traditional nuclear families can often times assume that they will celebrate holidays and special occasions together, while many stepfamilies have to navigate custody agreements and visitation schedules when it comes to the holidays and celebrations. Additionally, many stepfamilies encounter challenges because there are no institutional guidelines regarding the stepparents' authority to discipline stepchildren nor the legal ties between those in a stepfamily. A stepparent cannot pick a child up from school if they are sick or take the child to a doctor's appointment without the

biological parent's written consent or permission. Further, stepfamilies cannot always depend on traditional language or kinship terms to refer to one another or to extended family members in the same way that those in nuclear families can (e.g., mother, grandmother, aunt); while some people call their stepparent mom or dad, others call that person by their first name or create their own special names. Likewise, some simply refer to half- and step- brothers and sisters as their brothers and sisters, others make a point to differentiate and include half- or step- in the way they refer to their siblings, while some individuals simply refer to their step-siblings as the children of their parent's partner. In order for a stepfamily to function properly, members of the stepfamily need adequate terms for their roles, so that they can attach value and meaning to those roles (Cherlin, 1978). In other words, without institutional guidelines (like the ones that generally come with first marriages or first unions) or the proper language for stepfamily members to refer to one another, they will likely struggle to get along, to form routines, to establish clear expectations, and to attach value and meaning to their stepfamily member role. Due to the lack of clearly defined roles and expectations within stepfamilies, relationships among step-siblings may involve more conflict and less warmth than full-sibling relationships (Vogt Yuan, 2009). This suggests that full-siblings, who have clearly defined institutionalized roles, will report better relationship quality with one another than half-siblings or step-siblings (Hypothesis 1).

Half-siblings who share one biological parent still experience an incomplete institution, but arguably they experience greater institutionalization than step-siblings who do not share a biological parent. For instance, half-siblings are expected to have a life long relationship with one another due to their biological tie regardless of their parents' relationship status, share some of the same biological connections and thus use the same kinship language for many relatives (e.g. mother, grandfather); in addition, there is a chance that one of the siblings is living with two

biological parents among half-siblings, but not step-siblings (Manning et al., 2014). Past research has shown that the birth of a shared biological child makes the role of stepfather better defined in the family, such that stepfathers who have both biological children and stepchildren are more likely than stepfathers who only have stepchildren to behave as biological fathers and talk with their children to increase their social capital (Cooksey & Fondell, 1996; Hofferth 2006). Drawing on the incomplete institution perspective and these prior findings, I expect that half-siblings will report better sibling relationship quality than step-siblings (Hypothesis 1).

The Role of Family Characteristics

As discussed earlier, according to the incomplete institution perspective, ambiguous ties among family members and the lower sense of inclusion within one's family are the key to understanding poorer sibling relationship quality among half-siblings and step-siblings compared to full-siblings. This suggests that closer relationships with residential parents and higher sense of cohesion within stepfamilies or blended families may be related to better sibling relationship quality. Such indicators of family relationships may include parent-child relationship quality, close relationships among family members as a whole, and residential parents' type (biological vs. step) (Amato et al., 2016; King, 2006; Sweeney 2010). Below I discuss how each of these factors may be related to the association between sibling types and sibling relationship quality.

Prior research on blended or step- families has found parent-child relationship quality to be a primary family characteristic influencing the effects of step- or blended family living on children. Family systems theory posits that all parts of a family system are interconnected (e.g. Broderick, 1993; Buehler, 2020; King, Boyd, & Thorsen, 2015; Gilligan et al., 2020). This theory contends that the quality of the parent-child relationships may influence the quality of sibling relationships among children, based on the assumption that "all parts of a family system

are interconnected with each subsystem (e.g., mother-child) affecting all other subsystems" (e.g., full-, half-, or step- siblings) (King & Lindstrom, 2016). Past research finds that the quality of relationships and communication between residential mothers and their children significantly influences the closeness of relationships between stepfathers and children (Jensen & Shafer, 2013; King, Amato, & Lindstrom, 2015). Therefore, it seems reasonable that relationship quality between residential parents and children would influence the quality of relationships between residential siblings. The effects could be reciprocal—children's relationships among siblings could influence mother-child and father-child relationship. In this chapter, I do not intend to examine the causal direction as it is not the research question I aim to explore; my goal is to examine whether differences in sibling relationship quality remain across full-, half-, and step-siblings, when mother-child and father-child relationship quality are held constant.

A small body of empirical research has considered the association between parent-child relationship quality and sibling relationship quality. One longitudinal study that used a sample of 200 White working/middle class 2-parent families analyzed family correlates of sibling intimacy and conflict from childhood through adolescence (Kim et al., 2006). The authors find that there was a positive association between maternal acceptance and responsiveness that was based on a 24-item scale where mothers rated their behaviors and feelings toward each of their offspring, and sibling intimacy, as well as, a positive association between father-child conflict and sibling conflict over time. The association between mother-child conflict and sibling conflict was evident only for siblings who were close in age (Kim et al., 2006). Pike and colleagues (2005) found that the quality of parent-child relationships partially mediated the link between sibling relationship quality and adolescent adjustment, suggesting the importance of including measures for parent-child relationship quality when considering the association between sibling

relationship quality and other variables or outcomes. Due to the possibility that sibling relationship quality may be influenced by their own and other parent-child relationships within the family, I will examine whether the difference in residential sibling relationship quality exist when the quality of the respondents' residential mother-child relationships and residential father-child relationships are included in the model.

Recently, *family belonging*, defined as the extent to which children feel they "belong" to the family (King, Boyd, & Thorsen, 2015; King et al., 2018), has been recognized as a unique indicator in family characteristics that may help us better understand family complexity and its implications for relationship quality among family members. King and colleagues (King, Boyd, & Thorsen, 2015; King et al., 2018) as well as other research (e.g., Cavanagh, 2008) have shown that feelings of family belonging are distinct from the quality of an individual's relationships with each family member, although closely related, and have an independent effect from individual parent-child relationship quality on the well-being of adolescents. Using data from the Add Health, King and colleagues (2018) found that family belonging mediated the associations between parent-adolescent closeness and the well-being of adolescents across all family types with regard to depressive symptoms, delinquency, and alcohol use, as well as, failing a class and tobacco use (except for those living with single fathers or married fathers and stepmothers), and marijuana use (except for those in married father and stepmother families). The authors also found that adolescents in the various family forms have different levels of family belonging. Specifically, adolescents who lived with two biological parents reported the greatest levels of family belonging, compared to those who lived in stepfamilies or single parent families. Those who lived with single mothers or in biological mother and stepfather families reported greater levels of family belonging than those who lived with single fathers and those

with married biological fathers and stepmothers (King et al., 2018). Extending this line of research, I would argue that greater sense of family belonging would be related to better sibling relationship quality. Further, I expect that after controlling for family belonging, the association between sibling type and quality of sibling relationships would be reduced or disappear.

Finally, it is important to note that not all children with half-siblings have the same relationships with their parents. Among the 8 million (11%) children living with a half-sibling, the majority were (72%) living with two parents, either biological, step, or adoptive, while 2.1 million (26%) were living with only one parent (Kreider & Ellis, 2011). Thus it is important to control for whether each residential parent is their biological or stepparent, in addition to, parent-child relationship quality. Given these prior findings, I expect that after controlling for mother-child relationship quality, father-child relationship quality, family belonging, and residential mother and father type, the expected differences in sibling relationship quality across respondents with full-, half-, and step- siblings will be reduced or disappear.

The Present Study

Despite widespread family complexity, there is a lack of research that considers the association between residential sibling type and relationship quality in adolescence. Using data from Add Health, this chapter examines whether sibling relationship quality varies by sibling type across full-, half-, and step- siblings. As I will detail in the next section, the data do not allow me to examine individual pairs of siblings but, rather, simply individuals with residential siblings; instead, I will examine whether the composition of residential sibling types is related to the respondents' reports of sibling relationship quality. Drawing on the stepfamilies as an incomplete institution perspective and the family-systems theory, I present the following hypotheses.

Hypothesis 1: Respondents who have residential full-siblings only will report greater feelings of love, more time spent together, and less fighting with siblings than respondents who have at least one residential half-sibling or at least one residential step-sibling. Respondents who have at least one residential half-sibling but no residential step-siblings, will report lower levels of feelings of love, less time together, and more fighting with siblings than respondents who have residential full-siblings only, but will report greater feelings of love, more time spent together, and less fighting with siblings on average than respondents who have any residential step-siblings.

Hypothesis 2: After controlling for indicators of family characteristics, such as residential mother type and residential father type, mother-child relationship quality, father-child relationship quality, and feelings of family belonging, there will be no differences in sibling relationship quality across respondents with different types of siblings.

As briefly mentioned earlier, past research on sibling relationship quality during adolescence has identified multiple factors as predictors of sibling relationship quality or adolescent well-being, including: gender composition of sibling groups, respondent's race/ethnicity, respondent's age (e.g., Harcourt et al., 2015; Hofferth, 2006), birth order (e.g., Halpern-Meekin & Tach, 2008; Vogt Yuan, 2009), and number of siblings. These factors will serve as control variables in my analyses.

Method

Data

This chapter uses data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) Waves I and II. Add Health is nationally representative sample of students in grades 7-12 (Harris & Udry, 2008). The sampling frame was comprised of a stratified, random

sample of all high schools in the United States. Eligible schools had an 11th grade and at least 30 enrolled students, or were a feeder school that had a 7th grade that sent on to high school. Wave I collection took place in 1995 when respondents were 12 to 17 years old. Wave I included 20,745 students who participated in the in-home interview. All adolescents in grades 7 through 11 in Wave I and 12th graders who were part of the sibling subsample were re-interviewed in 1996 for Wave II in-home interviews (*n* = 14,738, 88.6%).

Of the 14,738 respondents, 13,570 had the weight variable (i.e., in the core sample); 10,899 had siblings (a twin, half-sibling, step-sibling, adopted sibling, or foster sibling) between 11 and 20 years of age living in the household (Harris et al., 2013); and 8,506 answered relationship quality with at least one of the siblings they were living with. After excluding those who have missing data in variables in the analysis, the final sample size was N = 8,402.

Dependent Measures

The dependent variables were three aspects of *sibling relationship quality in adolescence*, love for one's sibling, time spent together, and frequency of fights was measured in Wave II. *Love* for sibling was measured by the question, "How often do you feel love for {Name of the focal sibling}?" (1 = *never*, 2 = *seldom*, 3 = *sometimes*, 4 = *often*, 5 = *very often*). *Time together* was measured by the question, "How much time do you and {Name of the focal sibling} spend together?" (1 = *none*, 2 = *little*, 3 = *some*, 4 = *a lot*). *Fights* was measured by the question, "How often do you and {Name of focal sibling} spend together?" (1 = *never*, 2 = *seldom*, 3 = *sometimes*, 4 = *often*, 5 = *very often)*. There is a caveat in the dependent variable. Respondents answered each of these three questions regarding each of up to 7 siblings living in the household who were aged 12 to 20 (the vast majority answered for one or two siblings). As I will discuss in the independent measures section, information about type, age, and gender of these siblings was

available through the household roster only, which included up to 12 siblings. Unfortunately, there was no identifier in the data that allowed researchers to match the particular siblings that respondents were referring to when they were answering questions regarding their relationship quality and when they were giving information about type, age, and gender of each sibling in the household roster. Thus, I decided to measure each aspect of sibling relationship quality —love, time together, and fights —as the *average* of scores that respondents answered for all siblings. For example, if respondents answered the question regarding time spent together for two siblings with rating "1" for one sibling and rating "2" for the other sibling, the time together with siblings was "1.5."

Independent Measures

The independent measure was *sibling relationship type*. The respondents were asked about each household member's relationship to themselves. When they chose "brother" or "sister", they were further asked about the person' relationship to themselves, including full-brother, half-brother, step-brother, adoptive brother, foster brother, other brother, full-sister, half-sister, step-sister, adoptive sister, foster sister, other sister. There was no information about twins. As I just mentioned for the dependent measures, information about sibling type was available through the household roster where respondents were able to report up to 12 siblings. Given that sibling relationship quality was only asked for siblings aged 12 to 20, I identified the number of full-siblings (including adoptive siblings), half-siblings, and step-siblings or other siblings aged 12 to 20 for each respondent. Because I was unable to match a specific sibling in the household roster with a specific sibling in the sibling relationship quality questions, I decided to measure sibling type as three dummy variables including (a) full-siblings only (reference), (b) at least one half-sibling, but no step-siblings (with or without full-siblings) and (c) at least one

step-sibling or other sibling (with or without full-siblings or half-siblings). Alternate compositions of sibling type broken down into 7 more nuanced categories is presented in Appendix A.

Primary Control Measures

Residential mother type was measured based on the household roster as dummy variables including biological mothers (reference), stepmothers, and no mothers living in the household Similarly, residential father type was measured based on the household roster as dummy variables including biological fathers (reference), stepfathers, and no fathers living in the household. Following Halpern-Meekin & Tach (2008), the residential mother-child relationship quality scale was created as the average of 3 items ($\alpha = 0.85$) including: Do you agree or disagree with the following statement? (a) Most of the time, {MOM NAME} is warm and loving toward you. (b) You are satisfied with the way {MOM NAME} and you communicate with each other. (c) Overall, you are satisfied with your relationship with {MOM NAME}. (1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, 5 = *strongly agree*). Then, to include those who did not have residential mothers, the mother child-relationship quality was divided into low mother-child relationship quality (1 to 3.99), medium mother-child relationship quality (4 to 4.99; reference), high mother-child relationship quality (5), and no mother-child relationship quality for those who did not have residential mothers.

As with mothers, the residential father-child relationship quality scale was created as the average of 3 items ($\alpha = 0.87$) including: (Do you agree or disagree with the following statement? (a) Most of the time, {DAD NAME} is warm and loving toward you. (b) You are satisfied with the way {DAD NAME} and you communicate with each other. (c) Overall, you are satisfied with your relationship with {DAD NAME.} (1 = *strongly disagree*, 2 = *disagree*, 3 = *neither*

agree nor disagree, 4 = *agree*, 5 = *strongly agree*). To include those who did not have residential fathers in the analysis, the father child-relationship quality scale was divided into low father-child relationship quality (1 to 3.99), medium father-child relationship quality (4 to 4.99; reference), high father-child relationship quality (5), and no father-child relationship quality for those who did not have residential fathers.

Following King and colleagues' lead (King, Boyd, & Thorsen, 2015; King et al., 2018), family belonging was the average of 3 items ($\alpha = 0.79$) including (a) "How much do you feel people in your family understand you?" (b) "How much do you feel that you and your family have fun together?" and (c) "How much do you feel that your family pays attention to you?" (1 = *not at all*, 2 = *very little*, 3 = *somewhat*, 4 = *quite a bit*, 5 = *very much*).

Control Measures

Gender composition of the sibling group was comprised of three dummy variables, (a) sibling group includes sisters and brothers (ref) (b) respondent and sibling(s) are all males/brothers, (c) respondent and sibling(s) are all females/sisters. The *respondents' race/ethnicity* was comprised of four dummy variables indicating whether the respondent identifies as (a) White (reference), (b) Black, (c) Hispanic, or (d) other races. The *respondent's sex* was comprised of two dummy variables including whether the respondent is a male (= 0) or female (=1). The *respondents' age* was measured in years. *Respondent's birth order* was measured using three dummy variables including (a) middle child (reference), (b) youngest, (c) oldest.

Number of siblings aged 12 to 20 living in the household was measured using the household roster.

Table 2.1 presents descriptive statistics for the key variables in the analyses.

Analytic Strategy

I used ordinary-least-squared (OLS) regression models to examine the association between three sibling types—respondents with only residential full-siblings, respondents with residential half-siblings (they might or might not have residential full-siblings), but no residential step-siblings, and respondents with residential step-siblings (they might or might not have residential full-siblings and/or residential half-siblings)—and the three aspects of sibling relationship quality – feelings of love, time spent together, and fights – in adolescence. The nonindependence sampling design (i.e., school-based) of Add Health required a statistical correction to account for standard inflation. Therefore, all analyses used SAS PROC Surveymean and PROC Surveyreg and data were weighted to account for sampling design and standard error inflation (Siller & Tompkins, 2006). The current analysis did not include siblings living outside of the household or any siblings who were older than 20 or younger than 12.

First the descriptive statistics are presented (Table 2.1). Next, the bivariate results displaying the association between respondent's residential sibling type and sibling relationship quality are presented (Table 2.2.) Finally, two models were estimated for each aspect of sibling relationship quality (Table 2.3). Model 1 examined the association between respondents' sibling types and sibling relationship quality in adolescence, and included the sibship characteristics and social demographic control variables. Model 2 added the family characteristics variables to Model 1.

Table 1. Chapter II Descriptive Statistics

	M	SD		*M*	SD
Respondents' Sibling Type			*Respondent's Characteristics*		
Full-siblings only	0.84		Respondent's age	16.62	10.99
Half-siblings	0.07		*Sex*		
Step-siblings	0.08		Female	0.50	
Sibling Relationship Quality			Male	0.50	
Love (1-5)	3.94	2.37	*Race/ethnicity*		
Time Together (1-4)	3.02	1.60	White	0.65	
Fights (1-5)	2.98	2.15	Black	0.14	
			Hispanic	0.13	
Family Characteristics			Other	0.07	
Residential Mother Type					
Biological mother	0.91		*Sibship Characteristics*		
Stepmother	0.03		Number of siblings	1.41	1.62
No residential mother	0.06		*Birth Order*		
Residential Father Type			Oldest	0.49	
Biological father	0.67		Middle	0.20	
Stepfather	0.12		Youngest	0.31	
No residential father	0.21		*Sibling gender composition*		
Mother-child relationship quality			Brothers & sisters	0.56	
Low	0.19		Sisters only	0.21	
Mid	0.48		Brothers only	0.23	
High	0.28				
No residential mother	0.06				
Father-child relationship quality					
Low	0.23				
Mid	0.36				
High	0.19				
No residential father	0.21				
Family belonging (1-5)	3.75	1.39			

Results

Descriptive Results

Table 2.1 displays descriptive statistics for all variables used in the analyses. The average age of the respondents was 16.6 years old. Approximately two-thirds (65%) of the sample identified as White, while 14% identified as Black, 13% identified as Hispanic, and 7% identified with other races. The sample was split pretty evenly (50%) between boys and girls.

Most of the respondents (84%) only had full-siblings, while 7% had a half-sibling, but no step-sibling, and 8% of the sample had at least one step-sibling or other sibling. On average, respondents had 1.41 siblings. Nearly half (49%) of the respondents were the oldest siblings, 31% were the youngest sibling, and one-fifth of respondents were a middle sibling. Most (56%) of sibling groups were compromised of brothers and sisters, while 23% were comprised of all brothers, and 21% included only sisters.

For sibling relationship quality, the average score for time together was 3.02 on a 4-point scale (1-4). The average score for fights was 2.98, and the average score for love was 3.94, both on a 5-point scale (1-5).

The vast majority (91%) reported that their resident mother was their biological mother, 3% reported that their resident mother was their stepmother, and 6% reported that they did not have a resident mother. For mother-child relationship quality, 28% of respondents reported high relationship quality, while about 48% of respondents reported average relationship quality, 19% reported low levels of relationship quality, and 6% did not have relationship quality to report on because they did not have a resident mother. Two-thirds (67%) lived with their biological fathers, while 12% lived with a stepfather, and 21% reported they did not have a resident father. For father-child relationship quality, roughly one-third of respondents (36%) reported average

relationship quality, while 23% reported low relationship quality, about one-fifth (19%) reported high relationship quality, and 21% did not have relationship quality to report on because they did not have a resident father. For family belonging the average was 3.75 on a 5-point (1-5) scale.

Table 2. Bivariate Associations

	Love			Time Together			Fights		
	b	*SE*		*b*	*SE*		*b*	*SE*	
Sibling-Type									
Half-sibling	-0.05	0.06		-0.14	0.06	*	0.06	0.07	
Step-sibling	-0.47	0.07	***[c]	0.02	0.06		-0.42	0.07	***[c]
Intercept	3.99	0.26	***	3.03	0.18	***	3.01	0.24	***
R^2	0.02	***		0.00	***		0.01	***	

Differences from respondents with full-siblings were significant at *p < .05; ** p <.01; *** p <.001. Differences from respondents with half-siblings were significant at [a]p < .05; [b]p <.01; [c]p <.001

Bivariate Results

Table 2.2 provides the baseline associations between residential sibling type and sibling relationship quality in adolescence. With regard to the first aspect of adolescent relationship quality, love, respondents with residential step-siblings report significantly less love for their siblings compared to respondents with residential full-siblings only and respondents with half-siblings. There were no significant differences in reports of love for one's siblings between respondents with residential full-siblings only and respondents with residential half-siblings. Looking at the second aspect, time together, respondents with residential half-siblings reported spending less time together with their siblings than respondents with only residential full-siblings. There were no significant differences in reports of time together between respondents with only residential full-siblings and respondents with residential step-siblings, nor were there significant differences in reports of time together between respondents with residential half-siblings and respondents with residential step-siblings. With regard to the final aspect of sibling

relationship quality, fights, respondents with residential step-siblings reported fighting significantly less than both respondents with only residential full-siblings and respondents with residential half-siblings. While there were no significant differences in reports of fights between respondents with residential full-siblings only and respondents with residential half-siblings.

Multivariate Results

The first aspect of adolescent sibling relationship quality that was examined was love for one's sibling (Table 2.3). Model 1 tested the association between residential sibling types (full-siblings only; includes half-siblings, but not step-siblings; includes step-siblings) and love for one's siblings with control variables (the sibship characteristics and social demographic variables). Compared to the respondents who lived with full-siblings only, both the respondents who lived with at least one half-sibling but no step-sibling ($b = -.13$, $p < .05$) and the respondents who lived with at least one step-sibling ($b = -.50$, $p < .001$) reported significantly less love for their siblings.

In additional analyses (not shown) where respondents with half- siblings, but no step-siblings served as the reference group rather than respondents with only full-siblings, as hypothesized, the respondents with step-siblings reported significantly less love for their siblings ($b = -0.37$, $p < .001$) than those with half-siblings, but no step-siblings.

Model 2 added in the family characteristic variables (residential mother type, residential father type, mother-child relationship quality, father-child relationship quality, and family belonging). With regard to reports of love for one's siblings, respondents who lived with half-sibling no longer significantly differed from respondents who lived with only full-siblings once the family characteristic variables were included. Respondents who lived with step-siblings continued to report significantly less love for their siblings compared to respondents who lived

with only full-siblings (b = -0.46, p <.001) and respondents that lived with half-siblings (b = -0.37, p <.001; not shown). High mother-child relationship quality (b = 0.23, p <.001), high father-child relationship quality (b = 0.12, p <.001), and family belonging (b = 0.26, p < .001) all significantly and positively influenced reports of love for one's sibling.

Among control variables, being female (b = 0.24, p < .001), respondent's age (b = 0.07, p <.001), identifying as Black (b = 0.40, p <.001), identifying as Hispanic (b = 0.11, p <.05), and being in an all females/sisters sibling group (b = 0.15, p < .001) all had a positive and significant influence on reports of love for one's sibling, while being in an all males/brothers sibling group (b = -0.13, p <.05) had a negative and significant influence on reports of love for one's sibling.

The second aspect of sibling relationship quality that was analyzed was time together with one's siblings. Model 1 tested the association between residential sibling types and time together with the sibship characteristics and social demographic control variables. Compared to respondents who lived with only full-siblings, respondents who lived with half-siblings reported spending significantly less time together (b = -0.17, p < .01). Contrary to the hypothesis, there were no significant differences between respondents who lived with only full-siblings and respondents with step-siblings in reports of time together. Further, compared to respondents who lived with step-siblings, respondents who lived with half-siblings reported spending less time together (b = -0.20, p < .05).

Model 2 added in the family characteristic variable. Though the difference was reduced, respondents who lived with half-siblings continued to report spending significantly less time together (b = -0.13, p <.05) than respondents who lived with only full-siblings. However, the differences between respondents who lived with half-siblings and respondents that lived with step-siblings disappeared once the family characteristic variables were included. Having no

residential mother (b = 0.24, p < .001), high mother-child relationship quality (b = 0.12, p <.001) and family belonging (b = 0.21, p < .001) all had a positive and significant influence on reports of time together, whereas low father-child relationship quality was related to siblings spending less time together (b = -0.10, p < .01).

Among control variables, respondent's being female (b = 0.12, p < .01), identifying as Black (b = 0.19, p < .001), identifying as Hispanic (b = 0.13, p < .01), identifying as an "other" race (b = 0.14, p <.05), being in all females/sisters sibling group (b = 0.30, p <.001), and being in an all males/brothers sibling group (b = 0.26, p < .001) had a positive and significant influence on reports of time together, while being the oldest sibling (b = -0.12, p < .05) and being the youngest sibling (b = -0.15, p < .01) had a negative and significant influence on reports of time together with one's siblings.

The findings that respondents who lived with step-siblings spent more time together than respondents who lived with half- siblings and that there was little difference in time spent together between respondents who lived with only full-siblings and respondents that lived with step-siblings were unexpected. A possible explanation may lie in the family structure of respondents by the type of sibling they lived with (see Appendix Table B). Among respondents that lived with step-siblings, about 17% (14.0% + 2.7%) lived with their biological father and stepmother or biological father only, and 26% lived in "other" types of households, meaning that over 40% of respondents who were living with step-siblings were not living with their biological mothers. While among respondents who lived with only full-siblings less than 7% lived with their biological father and stepmother, biological father only, or in "other" types of households (1.3%, 2.7%, and 3.05, respectively) and among respondents that lived with half-siblings (but not

step-siblings), just over 5% lived with their biological father and stepmother or biological father only (2.7% for each), and 6% lived in "other" types of households.

The overrepresentation of respondents who lived with step-siblings not living with their biological mothers may mean that respondents who lived with step-siblings were living together full-time with limited or without custody or visitation arrangements with the mother that would otherwise influence respondents with step-sibling to spend less time together. Additionally, approximately 70% of respondents that lived with half-siblings lived with their biological mother and stepfather or with only their biological mother (33.6% and 35.9% respectively), and visitation with their nonresidential father may explain why respondents that lived with half-sibling spent less time together than respondents that lived with only full-siblings, both with and without the family characteristic variables, as well as, why the respondents that lived with half-siblings reported less time together than respondents that lived with step-siblings, before the family characteristic variables were introduced. Additionally, not living with a residential biological mother had a positive and significant influence on reports of time together. Although family structure was not a part of our primary analyses, family structure does seem to indirectly influence sibling relationship quality.

The third aspect of sibling relationship quality that was analyzed was fights. Model 1 tested the association between residential sibling types and fights with one's siblings with the sibship characteristics and social demographic control variables. There were no significant differences between respondents who lived with only full-siblings and respondents who lived with half-siblings. Respondents who lived with step-siblings reported significantly less fighting than respondents who lived with only full-siblings ($b = -0.28$, $p < .001$) and respondents that lived with half-siblings, but not step-siblings ($b = -0.37$, $p < .001$; not shown).

Model 2 added in the family characteristic variable. There continued to be no significant differences between respondents who lived with only full-siblings and respondents who lived with half-siblings, but not step-siblings. Respondents who lived with step-siblings continued to report fewer fights than respondents who lived with only full-siblings ($b = -0.30$, $p < .001$) and respondents who lived with half-siblings ($b = -0.36$, $p < .001$). Family belonging ($b = - 0.18$, $p < .001$) had a significant and negative influence on reports of fights with one's siblings.

Among control variables, respondent's being female ($b = 0.14$, $p < .001$) and being the oldest sibling ($b = 0.25$, $p < .001$) had a significant and positive influence on reports of fights (more fights reported), while respondent's age ($b = -0.12$, $p < .001$), respondent identifying as Black ($b = -0.14$, $p < .01$), respondent identifying as Hispanic ($b = -0.17$, $p < .01$), having more siblings ($b = -0.16$, $p < .001$), and being the youngest sibling ($b = -0.21$, $p < .01$) had a significant and negative influence on reports of fighting (less fighting).

One explanation for respondents with step-siblings fighting significantly less than both respondents with only full-siblings and respondents with half-siblings, is that fights are not necessarily a negative aspect of sibling relationship quality in adolescence or later in life, and instead fights may actually make sibling relationships stronger. Prior research has suggested that conflict between siblings may have benefits for long term functioning in sibling relationships (Lindell et al., 2014). Couples research has found that fights and working through anger or negative emotions is better for relationships than stonewalling, or a lack of response and working through emotions (Gottman, 2008), and it is likely that fights between siblings function similarly in sibling relationships.

Table 3. Ordinary-Least-Squared Regression Models Predicting Sibling Relationship Quality at Wave II (N = 8,402)

	Love						Time Together						Fights					
	Model 1			Model 2			Model 1			Model 2			Model 1			Model 2		
	b	SE		*b*	SE		*b*	SE		*b*	SE		*b*	SE		*b*	SE	
Sibling Type																		
With half-siblings	-.13	.05	*	-.09	.06		-.17	.06	**[a]	-.13	.06	*	.09	.06		.06	.07	
With step-siblings	-.50	.07	***[c]	-.46	.07	***[c]	.03	.06		.01	.06		-.28	.06	***[c]	-.30	.08	***[c]
Family Characteristics																		
Residential stepmother				-.10	.10					.03	.08					.00	.09	
No residential mother				.00	.08					.24	.06	***				.03	.08	
High mother-child RQ				.23	.04	***				.12	.03	***				.03	.05	
Low mother-child RQ				-.05	.05					.03	.04					-.04	.04	
Residential stepfather				.10	.05					.02	.04					-.01	.06	
No residential father				.01	.05					-.05	.03					.01	.05	
High father-child RQ				.12	.04	***				.05	.04					.05	.05	
Low father-child RQ				-.08	.06					-.10	.04	**				.05	.05	
Family belonging				.26	.03	***				.21	.02	***				-.18	.03	***
Controls																		
Social Demographics																		
R female	.23	.05	***	.24	.04	***	.11	.04	**	.12	.04	**	.16	.04	***	.14	.04	***
R's age	.05	.01	***	.07	.01	***	-.02	.01	*	-.02	.01		-.12	.01	***	-.12	.01	***
R's Race/ethnicity																		
Black	.44	.05	***	.40	.06	***	.21	.04	***	.19	.03	***	-.17	.05	**	-.14	.05	**
Hispanic	.12	.05	*	.11	.05	*	.14	.04	***	.13	.04	***	-.18	.06	**	-.17	.06	**
Other race	-.03	.07		.03	.07		.10	.06		.14	.06	*	-.08	.07		-.10	.07	
Sibship Characteristics																		
Number of sibs	.03	.03		.04	.03		.00	.03		.01	.02		-.16	.03	***	-.16	.03	***
Oldest	.00	.06		-.02	.05		-.11	.05	*	-.12	.05	*	.24	.06	***	.25	.06	***

Youngest	.03	.06		.03	.05		-.14	.05	**	-.15	.05	**	-.21	.07	**	-.21	.07	**
All girls/females	.15	.04	***	.15	.04	***	.30	.04	***	.30	.04	***	.03	.05		.03	.05	
All boys/males	-.12	.06	*	-.13	.05	*	.28	.05	***	.26	.05	***	-.07	.05		-.07	.05	
Intercept	2.91	.22	***	1.62	.24	***	3.30	.18	***	2.36	.20	***	5.12	.20	***	5.85	.22	***
R-squared	.07	***		.16	***		.04	***		.10	***		.07	***		.09	***	

Differences from respondents with full-siblings were significant at *p < .05; ** p <.01; *** p <.001. Differences from respondents with half-siblings were significant at [a]p < .05; [b]p <.01; [c]p <.001

Omitted reference groups include: respondents with only full-siblings, biological residential mother, average mother-child relationship quality, biological residential father, average father-child relationship quality, respondent White, middle siblings, brothers & sisters

"RQ" indicates relationship quality

"R" indicates respondent

Discussion

This chapter examined the influence of residential sibling type on sibling relationship quality among adolescents aged 12-20, while also considering the influence of family characteristics. I had two hypotheses. Using the stepfamilies as an incomplete institution perspective (Cherlin, 1978) I expected that respondent who live with only full-siblings would report the best sibling relationship quality (greater feelings of love, more time together, and fewer fights), followed by respondents that lived with half-siblings (but not step-siblings), and then finally respondents who lived with step-siblings would report the worst relationship quality (Hypothesis 1). Further, drawing on the family systems theory (Broderick, 1993), after controlling for family characteristics such as residential parent type, parent-child relationship quality, and family belonging, I expected differences in sibling relationship quality across sibling types would be reduced or disappear (Hypothesis 2). My findings suggest that neither the stepfamilies as an incomplete institution perspective nor family systems theory fully help us to understand the notable variation in sibling relationship quality between respondents who lived with only full-siblings, respondents whose resident siblings included half-siblings, but not step-siblings, and respondents whose resident siblings included step-siblings. The stepfamilies as an incomplete institution perspective would be improved by explicitly incorporating families with half-siblings, not just step-siblings. I found only partial support for both hypotheses, depending on the residential sibling group type and the measure of sibling relationship quality.

For the effects of sibling type on reports of love for one's siblings, my findings support Hypothesis 1. Before family characteristics were introduced, as expected, respondents who lived with only full-siblings had greater reports of love than both respondents that lived with half-siblings and respondents that lived with step-siblings. Additionally, respondents who lived with

half-siblings (but not step-siblings) had significantly greater reports of love than respondents that lived with step-siblings. Hypothesis 2 received partial support with regard to reports of love. As expected, once family characteristics were introduced, differences in reports of love between respondents that lived with only full-siblings and respondents that lived with half-siblings disappeared. The differences between respondents that lived with step-siblings, and both respondents who lived with only full-siblings and respondents who lived with half-siblings remained and were not significantly reduced.

Hypothesis 1 received partial support with regard to time spent together. As expected, respondents who lived with only full-siblings had greater reports of time spent together than respondents who lived with half-siblings. However, counter to my hypothesis, there were no significant differences in reports of time together between respondents who lived with only full-siblings and respondents that lived with step-siblings. Additionally, respondents that lived with half-siblings reported spending significantly less time together than respondents that lived with step-siblings, which is opposite of my prediction.

Hypothesis 2 received limited support with regard to time spent together. Once family characteristics were introduced, differences in time together between respondents who lived with half-siblings and respondents who lived with only full-siblings remained significant, however they were significantly reduced. Although the reports of time together by residential sibling type were the opposite of what was expected, differences between respondents who lived with half-siblings and respondents who lived with step-siblings did disappear once family characteristics were introduced.

For fights, Hypothesis 1 was not supported. Counter to my hypothesis, respondents who lived with step-siblings actually had significantly less fighting than both respondents who lived

with only full-siblings and respondents that lived with half-siblings. Additionally, there were no significant differences in reports of fights between respondents who lived with only full-siblings and respondents who lived with half-siblings. Introducing the family characteristics measures did not significantly influence reports of fights, therefore Hypothesis 2 also did not receive support with regard to fights. One explanation as to why step-siblings actually fought less than both respondents who lived with only full-siblings and respondents that lived with half-siblings may be because fights with siblings in adolescence are not actually indicative of negative relationship quality. Past research suggests that conflict between siblings in adolescence may actually benefit relationship functioning in the long term (Lindell et al., 2014). Given this line of reasoning, that fights are not necessarily harmful or negative for sibling relationship quality, and may actually be beneficial, it makes sense that respondents who lived with step-siblings fought significantly less than respondents who lived with only full-siblings and respondents who lived with half-siblings.

Among the family characteristic variables, a greater sense of family belonging did influence more positive sibling relationship quality – greater reports of love, greater reports of time spent together, and fewer fights – across all residential sibling types. My findings are in line with past research that has found family belonging to be a key factor that helps to better understand relationship quality among family members (King, Boyd, & Thorsen, 2015; King et al., 2018). The other family characteristic variables were not as influential as family belonging across the measures of sibling relationship quality. As noted above, not living with a residential biological mother had a positive and significant influence on reports of sibling time together. High mother-child relationship quality had a positive and significant influence on reports of both love and time together among siblings, high father-child relationship quality had a positive and

significant influence on reports of love, while low father-child relationship quality had a negative and significant influence on reports of time together. The finding about mother-child relationship quality having positive and significant influence of siblings' reports of love extends past research that has found that mother-child relationship quality influences the quality of relationships between stepfathers and children (Jensen & Shafer, 2013; King, Amato, & Lindstrom, 2015).

It is important to consider the context of these sibling relationships when analyzing the results and making generalizations. These analyses focus on residential siblings only. At the baseline and in the full model, respondents with only residential full-siblings and respondents with residential half-siblings only differed in reports of time together. Whereas, at the baseline and in the full model, respondents with residential step-siblings reported less love for and less fighting with siblings compared to both respondents with only residential full-siblings and respondents with residential half-siblings. While I found that when other family characteristics were equal, respondents with residential half-siblings are more similar than different from respondents with only residential full-siblings, non-residential half-siblings may be more similar to residential and non-residential step-siblings. Biological ties do seem to matter based on variation by respondent's residential sibling type, however the strength of those biological ties may not be so important for residential siblings. Family characteristics explained some of the story, so perhaps if more complex family forms particularly those with residential step-siblings had better established norms, expectations, and behaviors than we might not see the same extent of variation in sibling relationship quality by respondent's residential sibling type. Further, feelings about family members particularly siblings, can change from day to day, especially during the teenage years and adolescents' emotional state can be rather turbulent. These analyses are based on the reports of individuals when they were 12-20 and their residential siblings who

were included were also 12-20. The average age of respondents was 16.6, and the results should be considered in this context.

An important contribution of this research is that sibling type was included. I examined respondents who lived with half-siblings (but no step-siblings) and respondents who lived with step-siblings separately, comparing their measures of relationship quality with each other, as well as, with respondents who lived with only full-siblings. Most sibling research has grouped all half-siblings and step-siblings together in their analysis. My findings reflect the importance of separating respondents who lived with half-siblings from respondents who lived with step-siblings. Additionally, it seems that other family characteristics equal, respondents who lived with half-siblings were more similar to respondents who lived with only full-siblings than to respondents who lived with step-siblings. Future research should be careful not to group half-siblings and step-siblings together when possible, as residential half-siblings and residential full-siblings seem to be more alike than residential half-siblings and residential step-siblings.

This research suggests that fights may not operate as expected in sibling relationships, and future research would benefit from efforts to better understand the mechanism of fights between siblings. By considering the associations between sibling type, family characteristic, and sibling relationship quality, this research helps us to better understand sibling relationship quality in the context of more complex family forms. Given the prevalence of half-siblings and step-siblings (Kreider & Ellis, 2011) and the association between sibling relationship quality and mental health (Buist et al., 2013), it seems important to start merging these two focuses within the existing body of research.

Although limited research has considered how sibling type might influence sibling relationship quality in adolescence, research has generally shown that closeness between siblings

is associated with less internalizing and externalizing problems among adolescents (e.g., Buist et al., 2013). Given the results found in this chapter and the results of past research, respondents with residential half-siblings and respondents with residential step-siblings may particularly benefit from efforts to improve sibling relationship quality and feelings of family belonging, as well as, mental health intervention.

One limitation of these analyses is that I was unable to directly match siblings from the household roster with reports of sibling relationship quality and therefore had to rely on averages from sibling groups. The siblings and parents included in these analyses were limited to residential siblings and residential parents. As discussed, this study focused on siblings living in the household aged 12-20, therefore some siblings were not included. For example, even if the respondents were quite close to siblings 21and older sibling or to siblings 11 and younger, those siblings would not be included in this study. Additionally, if the respondents' siblings live outside of the household with other parents or on their own, they would not be included in this study. Future research would benefit from analyzing samples that capture a wider age range of siblings, as well as, both residential siblings and siblings who live outside the household. Similarly, this study only focused on residential parents, so the influence of non-residential parent-child relationship quality was not included in these analyses. Although I would have liked to capture the amount of time respondents and their siblings were living together as family, the data did not allow for me to do this. Future research should include duration of time that respondents have lived with step-parents, step-siblings, or half-siblings, as well as, whether parents were married or cohabiting. Finally, the sample is dated (1994-1996) and therefore may not accurately capture the current state of sibling dynamics. Future researchers should utilize more recent samples of that include different types of siblings.

In conclusion, these analyses contribute to the existing bodies of family and sibling research by analyzing the association between residential sibling types – only full-siblings, half-siblings but no step-siblings, and step-siblings – and sibling relationship quality – reports of love, time together, and fights – while considering the role of family characteristic, and using a sample of respondents who included and allowed for some separation between respondents with full-, half-, and step- siblings. The findings suggest that both residential sibling type and family characteristics, particularly family belonging and mother-child relationship quality, are important for sibling relationship quality. Further, each sibling type is unique in the way that the sibling configuration influences different aspects of relationship quality, and this variation reflects the importance of separating different aspects of sibling relationship quality to better understand relationships across sibling types. Additionally, fights between siblings should not necessarily be interpreted as a negative aspect of relationship quality. Future research would benefit from analyzing more current samples of siblings that include respondents that have full-siblings, half-siblings, and step-siblings in order to better understand relationship quality among the different sibling types today.

CHAPTER III. SIBLING RELATIONSHIP QUALITY IN YOUNG ADULTHOOD: THE EFFECTS OF SIBLING TYPE AND ADOLESCENT RELATIONSHIP QUALITY

The sibling relationship is distinct compared to other close relationships because of its endurance, egalitarian status, and common family history (McHale et al., 2013; White, 2001). Given the potentially long duration of sibling relationships, many researchers have been interested in how sibling relationships differ across the life course (Spitze &Trent, 2018; White, 2001). However, past research has largely centered on childhood and adolescence (Buist et al., 2013) or mid- to later life (Connidis & Campbell, 1995; Gilligan et al., 2020), leaving sibling relationships in young adulthood less investigated. Young adulthood is the period when many siblings begin to live apart. As young people begin to establish independence from their parents, sibling relationships can serve as a source of friendship, support, love (Van Volkom et al., 2011), and advice in young adulthood (Dolgin & Lindsay, 1999), but siblings can also be a source of conflict (Milevsky et al., 2005). Previous studies have found closeness between siblings was associated with better mental health during this life stage (Milevsky, 2005; Sherman et al., 2006). Thus, it was important to examine which factors are related to various aspects of sibling relationship quality— visits, calls and emails, emotional closeness, seeking advice, and fights— during the transition to adulthood, roughly from ages 18 to 26.

In this chapter, I focused on how sibling relationship quality might vary across sibling types—full-, half-, and step- siblings—during the transition into adulthood. Very limited research (Mikkelson et al., 2011) has examined variation in relationship quality by sibling type. This is an important omission to address, as growing up with half-siblings and step-siblings has become a common experience of U.S. youths (Kreider & Ellis, 2011). First, I used the stepfamilies as an incomplete institution perspective (Cherlin, 1978) to predict that half-siblings

or step-siblings may visit, call, or email one another less often, have less close relationships, seek less help or advice, and fight more often than full-siblings during the transition to adulthood. Then, using the life course perspective (Elder 1994) and continuity theory (Fowler, 2009), I examined whether variation in sibling relationship quality during the transition to adulthood across full-, half-, or step- siblings, might depend on how close the siblings were during adolescence rather than sibling type per se.

Using sibling data for individuals 18-26 from the sibling sample in Wave II and Wave III of the National Longitudinal Study of Adolescent to Adult Health (N = 1,753), this chapter examined the following questions: (a) How do reports of sibling relationship quality among half-siblings or step-siblings differ from reports of relationship quality among full-siblings in young adulthood? Do half or step-siblings exchange as many visits, calls and emails, and have as much emotional closeness, aid seeking, and conflict with one another as full-siblings? (b) Do differences in levels of visits, calls and emails, emotional closeness, aid seeking, and conflict among siblings in young adulthood by sibling type reduce significantly or disappear when accounting for relationship quality with residential siblings during adolescence (i.e., love for, time together, fighting with)?

Literature Review

Sibling Relationship Quality in Young Adulthood

Much like other ties within the family, sibling relationships are multidimensional, and include associational (visits, calls and emails), affective (emotional closeness and fights), and functional (asking for help and advice) aspects (Sarkisian & Gerstel, 2008). Past research has typically focused on levels of sibling contact (Milevsky, 2005; Milevsky et al., 2005; Stocker et al., 1997), warmth, conflict, rivalry or power (Shortt & Gottman, 1997; Stocker et al., 1997),

closeness (Milevsky, 2005; Milevsky et al., 2005; Van Volkom et al., 2011), and giving and receiving help (Milevsky, 2005; Milevsky et al., 2005). Adult siblings can serve as a source of support, love, and friendship for one another (Van Volkom et al., 2011), as well as provide care for one another (Milevsky et al., 2005). Further, siblings can be a source of advice or a confidant with whom young adults discuss life challenges (Dolgin & Lindsay, 1999). Although some studies have conceptualized contact as a predictor of emotional closeness (e.g., Stocker et al., 1997) and contact may also predict fights, I examined each aspect of sibling ties separately.

I focused on sibling relationship quality in young adulthood. Research focusing on sibling ties has become more popular in recent years; however, most research has concentrated on sibling ties in childhood, adolescence, middle adulthood, and later years (e.g., Connidis & Campbell, 1995; Kim et al.2006). Research focusing on sibling ties in emerging adulthood or young adulthood has been quite limited. Further, studies that did focus on sibling relationships in young adulthood generally used convenience samples of college students and non-college students in a local area (Milevsky, 2005; Milevsky el., 2005; Sherman et al., 2006; Short & Gottman, 1997; Van Volkom & Beaudoin, 2017; Van Volkom et al., 2011; Vogt Yuan, 2009; Weaver et al., 2003; Whiteman, et al., 2011); therefore, it is not clear to what extent these findings can be generalized.

Prior research finds that having a supportive sibling relationship during the transition to young adulthood can be beneficial for individuals (Conger & Little, 2010; Milevsky, 2005; Milevsky et al., 2005; Van Volkom et al., 2011). However, little research has considered or differentiated by sibling type (i.e. step-, half-, full-) in young adulthood relationships (Mikkelson et al., 2011; Vogt Yuan, 2009; White & Riedmann, 1992), despite a notable proportion of individuals having half-siblings and step-siblings (Kreider & Ellis, 2011). Thus, it is important to

understand how sibling type is related to sibling relationship quality during the transition to adulthood.

The Link Between Sibling Type and Sibling Relationship Quality: Theoretical/Conceptual Framework

Sociologists have argued that stepfamilies are an *incomplete institution* (Cherlin, 1978) and that relationships among family members within stepfamilies are particularly complex and challenging, due to a lack of institutionalized norms, legal guidelines, expectations, and language to guide their interactions with one another. For instance, stepfamilies do not hold the same legal standing as traditional nuclear families with regard to parental rights. Traditional nuclear families can generally assume they will celebrate special occasions and spend holidays together, but this can be not always be the assumption for stepfamilies as it can be difficult to navigate the holidays with more complex family forms, especially while accommodating custody or visitation schedules. In addition, stepfamilies cannot always rely on traditional language to refer to one another in the same way those in traditional nuclear families can; some people call their stepparent mom or dad, some call that person by their first name, and some create their own special names. Similarly, some refer to half- and step- brothers and sisters simply as their brothers and sisters, while others are sure to differentiate and include half- or step- in the way they refer to their siblings and others simply refer to their step-siblings as the children of their parent's partner.

Cherlin (1978) posits that in order for a stepfamily to function properly, members of that stepfamily require appropriate terms for their roles (e.g., sister, mother, grandfather), so that they can attach symbols and meaning to those roles. Thus, without institutional guidelines or the appropriate language for blended families or stepfamily members to refer to one another,

individuals have to negotiate and navigate these roles and responsibilities for themselves and will likely have difficulty adapting and attaching legitimate behaviors, expectations, and overall meaning to their role as a stepfamily member. Past research suggests that due to the absence of clearly defined roles and expectations within stepfamilies, relationships among step-siblings may involve less warmth and more conflict than full-sibling relationships (Vogt Yuan, 2009).

Though half-siblings also experience an incomplete institution, siblings who share one parent arguably experience greater institutionalization than step-siblings, who do not share a biological parent. Particularly relevant to the present analysis, unlike step-siblings whose ties heavily rely on their parents' marriage/cohabitation and thus may depend on whether their parents stay together, half-siblings are expected to maintain a lifelong relationship with one another based on their shared genetic tie regardless of their parents' relationship status, as they still share some of the same biological connections and kinship language for many relatives (e.g., mother, grandfather). Additionally, there is a chance that one of the siblings grew up living with two biological parents, among half-siblings, but not step-siblings (Manning et al., 2014). The stepfamilies as an incomplete institution perspective suggests that full-siblings, who are likely to experience a complete institution, will report better relationship quality (i.e., more closeness, visits, calls and emails, seeking aid/advice, and less conflict) than half-siblings or step-siblings. Similarly, half-siblings, who tend to experience some extent of familial institutionalization, will report better relationship quality than step-siblings who are the most likely to experience an incomplete institution. It is important to note that one family could include full-, half-, and step-siblings. Also, for some sibling relationships more contact might actually lead to more conflict, and for these individuals, distant relationships may actually reflect better relationships.

Empirical examination of variation in sibling relationship quality by sibling type is limited. A dual study (N = 411; N = 232) analyzed the differential frequency of relational maintenance behaviors (i.e., positivity, assurance, openness, networks, and tasks) among genetically related and nongenetically related adult (18-29; 18-63) sibling relationships (i.e., twins, full-, half-, step-, and adopted siblings), finding that genetically related siblings generally use more relational maintenance behaviors than less genetically related siblings (Mikkelson et al., 2011). Another study used data from the 1987-1988 National Survey of Families and Households to compare contact with full-siblings and half-siblings/step-siblings in adulthood (White & Riedmann, 1992). Although respondents kept in touch with their half-siblings and step-siblings in adulthood, they saw them significantly less often than their full-siblings. Additionally, having no full-siblings encouraged contact with half-siblings/step-siblings among respondents (White & Riedmann, 1992). These findings reflect the importance of sibling relationships, as relational maintenance behaviors and contact were relatively common, and seemingly valued, among siblings. Both relational maintenance behaviors and overall contact were associated with sibling type and other sibship characteristics.

Although this dissertation chapter primarily focuses on the association between sibling type and sibling relationship quality in young adulthood, it is also important to consider the potential life course effects of sibling relationship quality in adolescence on sibling relationship quality in subsequent life stages (e.g., young adulthood).

The Role of Sibling Relationship Quality in Adolescence

Two key tenets of the life course perspective are continuity and change in lives across the life span. The life course perspective highlights the lasting effects of experiences or relationship patterns in an earlier stage of life on those in subsequent life stages (Elder, 1994). Much of the

sociological research using this idea has focused on change in the parent-child relationship quality from adolescence to the transition to adulthood and have found more continuity than change (Aquilino, 1997; Rossi & Rossi, 1991; Thornton et al., 1995). More recently, King and Lindstrom (2016), analyzed stepfather-stepchild closeness from adolescence to early adulthood, and found general stability in relationships during this transition, with roughly half (46%) having their relationships remaining close, less than one quarter remaining not close, and just under a third of these relationships experienced a change in relationship quality. The findings reflect overall stability, but some variability in nontraditional family relationships from adolescence to young adulthood.

Similarly, continuity theory posits that there is stability in behavior throughout the life span (Fowler, 2009). One of the leading continuity theorists in the field, Robert Atchley, describes the concept of continuity as "recurring themes and persistent patterns in which details can change as long as basic patterns are maintained" (Andrews, 2001). Thus, continuity does not indicate an absence of change in relationships or in life circumstances, but rather that adaptation generally occurs with change in order to maintain a sense of continuity in relationships and relationship maintenance behaviors. That is to say, although siblings generally move away from their family of origin and start their own lives as they transition from adolescence to young adulthood (Conger & Little, 2010), the basic patterns reflected in sibling relationship quality in adolescence will be maintained and reflected in sibling relationship quality in young adulthood, even as life circumstances change. For example, siblings who have moved apart may instead call, text, or visit, regularly to maintain their presence in each other's lives. Adult siblings may still watch or discuss their favorite show together every week, go to movies or concerts together, go holiday shopping with one another, or make it a point to continue to celebrate birthdays

together. In many families with adult children, even those who have children of their own, the adult children still return to their parents' homes for the holidays and continue their traditions and interactions from childhood, not only with their parents, but also with their siblings. If siblings were not close and did not do these kind of activities together in adolescence, it is likely they will not participate in these kind of activities together in adulthood. These ideas and empirical findings suggest that sibling relationship quality in young adulthood is influenced by sibling relationship closeness in adolescence rather than sibling type. Additionally, it is important to recognize that sibling relationship quality in adolescence and sibling type are not mutually exclusive.

Other Factors Related to Sibling Relationship Quality

Past research on sibling relationship quality during young adulthood has identified several factors as predictors of sibling relationship quality, including: age and age gap between siblings (Milevsky et al., 2005), older/younger sibling status (Dolgin & Lindsay, 1999; Milevsky et al., 2005), geographic distance between siblings (Mikkelson et al., 2011; Milevsky et al., 2005), race/ethnicity (Spitze & Trent, 2018), gender composition of the sibling dyad (Dolgin & Lindsay, 1999; Milevsky et al., 2005), and size of sibship (Milvesky et al., 2005). I will use these factors as controls in my analyses.

Recently, studies looked at how sibling relationship quality was influenced by life events in young adulthood such as educational attainment, forming partnerships, employment and becoming parents (Aldrich et al., 2018; Spitze & Trent, 2018). Results suggest that college education (either being in college, having some college education, or completing a college degree) is associated with more visits, more calls or emails, more help seeking, and more emotional closeness among siblings (Aldrich et al., 2018). Respondents with romantic partners

reported fewer visits (Aldrich et al., 2018; Spitze & Trent, 2018), and overall, romantic partnership was associated with fewer fights between siblings (Aldrich et al., 2018). Employment status and the transition from part-time to full-time work were also associated with fewer sibling visits (Spitze & Trent, 2018), while being employed full-time was associated with more calls and emails, more fights, and less emotional closeness (Aldrich et al., 2018). Those who remained childless were more likely to seek help from siblings or experience exchanges of support over time (Aldrich et al., 2018; Spitze & Trent, 2018), though in one of the studies, having a child was related to receiving more support from siblings (Spitze & Trent, 2018). Childless respondents whose siblings had children reported more visits and emotional closeness (Aldrich et al., 2018). Thus, I controlled for the respondents' and their siblings' education, romantic partnership, work status, and parental status.

The Present Study

Past research has found that sibling relationship quality can significantly influence young adults' mental health (Milevsky, 2005; Sherman et al., 2006). Although we know that having a sibling of any type is a common experience and that sibling relationship quality can influence mental health, limited research has examined the importance of sibling type in relation to sibling relationship quality, in young adulthood. Further, U.S. research has not considered the possibility that the association between sibling type and sibling relationship quality may depend on sibling relationship in adolescence. On the basis of the stepfamilies as an incomplete institution thesis, the life course perspective, and continuity theory, I present the following hypotheses.

Hypothesis 1: Full-siblings will report better sibling relationship quality (more visits, more calls and emails, more emotional closeness, more seeking aid/advice, and fewer fights), than

half-siblings and step-siblings. Half-siblings will report better sibling relationship quality compared to step-siblings, but not full-siblings.

Hypothesis 2: After controlling for sibling relationship quality in adolescence, differences in sibling relationship in young adulthood will be reduced or disappear.

Analyses controlled for possible confounding factors including: age, age-gap between siblings, (Milevsky et al., 2005), older/younger sibling status (Dolgin & Lindsay, 1999; Milevsky et al., 2005), geographic distance between siblings (Mikkelson et al., 2011; Milevsky et al., 2005), race/ethnicity (Spitze & Trent, 2018), gender composition of the sibling dyad (Dolgin & Lindsay, 1999; Milvesky et al., 2005), sibship size (Milevsky et al.,2005), respondents' and siblings' relationship status, education level, employment, parental status (Aldrich et al., 2018; Spitze & Trent, 2018), and relationship quality in adolescence (love, fights, time together).

Method

Data

The National Longitudinal Sample of Adolescent to Adult Health (Add Health) provided a nationally representative sample of students in grades 7-12 in 1995 (http://www.cpc.unc.edu/projects/addhealth). It is a stratified, random sample of all high schools in the United States. Eligible schools had an 11th grade and at least 30 enrolled students or were a feeder school that had a 7th grade that sent on to high school. Wave I was collected in 1995 when the respondents were 12 to 17 years old; and 20,745 students participated in at-home interviews. All adolescents in Grades 7 through 11 in Wave I and 12th graders who were part of the sibling pairs subsample were re-interviewed in Wave II in-home interviews (n = 14,738, 88.6%). Wave

III was collected in 2001 and 2002 when the respondents were 18-26 years old and 15,197 (roughly 77%) participants were retained from Wave I (Harris et al., 2013).

The sample of young adults used in the present analyses was drawn from the genetic sample in Wave III. The genetic sample was originally selected in Wave I as a sibling-pair sample where adolescents who reported having a twin, half-sibling, step-sibling, adopted sibling, or foster sibling between 11 and 20 years of age living in the household were included (Harris, et al., 2013). Additionally, a probability sample of full-sibling pairs from all adolescents in the survey were included. Both siblings in the pair participated in the in-home interviews as individual respondents. This means that one home could have more than one pair of sibling in the sample. The genetic sample in Wave I included 3,114 sibling dyads (i.e., 6,228 respondents). In Wave II, 2,218 sibling dyads (i.e., 4,436 respondents) were reinterviewed. As prior research has identified (e.g., McHale et al., 2009), there was a large amount of missing information in the Wave I genetic sample. Therefore, I used Wave II, instead of Wave I, to measure sibling relationship quality in adolescence. Due to the design of the survey, the respondents and their data are no longer paired in Wave III and 4,367 respondents who were part of the sibling pairs sample in Wave II were reinterviewed as individuals. (Carolina Population Center, 2003).

For the present analysis, I first removed 13 cases from the 4,367 respondents in Wave III genetic sample, because the respondent ID and the sibling ID were identical (producing a subsample of n = 4,354). Out of this sample, I selected the 3,260 respondents who were in the core longitudinal sample (i.e., those who had values in the weight variable; Chen & Chantala, 2014). Then I selected respondents whose focal siblings were the same ones between Waves II and III. In both Waves II and III, respondents were asked to evaluate the quality of their relationship with each of all siblings they had, including those who were not in the genetic

sample. Unfortunately, the focal siblings on whom the respondents answered about the quality of relationship with their siblings were not always the same ones between Waves II and III. Using the respondent IDs and the sibling IDs, I found that, of the 3,260 respondents, 1,753 respondents reported relationship quality with the same siblings in both Waves II and III. Thus, the analytical sample size was $N = 1{,}753$. It is important to note that respondents in this sample were residential siblings during adolescence and siblings that lived outside the household were not considered in these analyses.

Those who were in the present sample were quite similar to those who were dropped and any differences between the two were slight. Those who were in the present sample had the same reports of depression and lower reports of self-esteem, were younger, more likely to be female, less likely to be White, more likely to be Black, had the same likelihood of being Hispanic or an other race, had lower levels of education and work hours, were less likely to be single and more likely to be cohabiting, had the same reports of being married, and were more likely to be parents compared to those who were dropped (See Appendix Table C). Although this sample was not representative of young adults and siblings in the U.S. general population, it included both respondents' and their siblings' life course statuses and other characteristics, which other large-scale, longitudinal national data did not provide.

Dependent Measures

The dependent variables are five aspects of sibling ties, including visits, calls and emails, emotional closeness, aid seeking, and fights with siblings. *Visits* was measured by the following question: "How often do you and he/she see each other?" (0 = never, 1 = a few times a year, 2 = once or twice a month, 3 = once or twice a week, 4 = almost every day). *Calls and emails* was measured using a combined scale for the following two questions, "How often do you and he/she

talk on the phone?" "How often do you send letters or e-mail or receive them from him/her?" (0 = never, 1 = a few times a year, 2 = once or twice a month, 3 = once or twice a week, 4 = almost every day). *Emotional closeness* was measured by the question: "How close do you feel toward him/her?" (0 = not close at all, 1 = not very close, 2 = somewhat, 3 = quite close, 4 = very close). *Help and advice* was measured by the following question, "How often do you turn to him/her for help when you have personal problems or problems at school or work?" (0 = never, 1 = seldom, 2 = sometimes, 3 = often, 4 = very often). Fights was measured by the following question: "How often do you and {he/she} quarrel or fight?" (0 = never, 1 = seldom, 2 = sometimes, 3 = often, 4 = very often).

Independent Measures

The independent measure, *sibling relationship type*, was comprised of four dummy variables indicating whether the respondents' sibling is (a) full- (reference), (b) half-, (c) step-, or (d) twins measured in young adulthood (Wave III). Given that the focus of this chapter is on half-siblings or step-siblings compared to full-siblings who are not twins, I do not focus on the differences between twins and non-twins or twins and half-siblings or step-siblings.

Primary Control Measures

Three aspects of *sibling relationship quality in adolescence,* reports of love, frequency of fights, and time together, measured in Wave II, were included. *Love for sibling* was measured by the question, "How often do you feel love for {Name of the focal sibling}?" (1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often). *Frequency of fights* was measured by the question, "How often do you and {Name of the focal sibling} quarrel or fight?" (1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often). *Frequency of time spent together* was

measured by the question, “How much time do you and {Name of the focal sibling} spend together?” (1 = none, 2 = a little, 3 = some, 4 = a lot).

Control Measures

Age-gap between siblings was measured as the older sibling’s age subtracted by the younger sibling’s age. *Birth order* was comprised of four dummy variables including older (reference), younger, same age but not twins, and twins. *Geographic distance* was measured by the question, “How far in travel time do you and he/she live from one another?” I created three dummy variables including living together (reference), within one hour, and more than one hour away. The *respondent’s age* was measured in years. The *respondent’s race/ethnicity* was comprised of four dummy variables indicating whether the respondent identified as White (reference), Black, Hispanic, or other races. *Gender composition* of the sibling dyad was comprised of four dummy variables, (a) both the respondents and siblings were women (sister/sister, reference), (b) both the respondents and siblings were men (brother/brother), (c) respondents were men and siblings were women (brother/sister), and (d) respondents were women and siblings were men (sister/brother).

Both the respondents’ and their siblings’ *education status* was based off of an ordered variable ranging from 1 to 5: 1 = less than high school, 2 = high school diploma/GED (reference), 3 = some college, 4 = currently in college, and 5 = B.A. and beyond. Both the respondents’ and their siblings’ *employment status* was an ordered variable including 1= unemployed, 2 = employed part-time (less than 35 hours weekly), and 3 = employed full-time (35 hours or more weekly), measured by the question, “How many hours a week do you usually work at this job?” Both the respondents and their siblings’ relationship status were measured

using three dummy variables: single (reference), cohabiting, and married. *Parental status* was measured using a dummy variable where those with any children in the home are coded as 1.

Analytic Strategy

I used ordinary-least-squared (OLS) regression models to examine the association between sibling type—full-, half-, step-, and twin—and the five aspects of sibling relationship quality in young adulthood. The nonindependence sampling design (i.e., school-based) of Add Health as well as the matched sibling sample (i.e., two siblings share the same household characteristics) required a statistical correction to account for standard inflation. Therefore, all analyses used SAS PROC Surveymean and PROC Surveyreg and were weighted to account for sampling design and standard error inflation (Siller & Tompkins, 2006). I used multiple imputation suggested by Allison (2001) to deal with missing values.

Two models were estimated for each of the five aspects of sibling relationship quality. First, Model 1 examined the association between sibling type and sibling relationship quality and included all sibship characteristic and social demographic control variables. Model 2 added sibling relationship quality in adolescence variables to Model 1 to examine whether the association between sibling type and sibling relationship quality would be reduced or disappear. For both Models, I calculated f-tests to examine whether coefficients for the sibling types would be different across the three sibling types.

Results

Descriptive Results

Table 3.1 displays descriptive statistics for all variables in the analyses for the full sample and by sibling type. As shown for the full sample, the average age of the respondents was 21.8 years old. Two-thirds of the sample (66 %) identified as White, while 17% identified as Black,

8% identified as Hispanic, and 9% identified with another race. The average level of education was 2.94 on a 5-point scale, reflecting that most respondents had a high school diploma or GED and many had at least some college. The average work status was 2.24 on a 3-point scale (1 = non-employed, 2= employed part-time, and 3 = employed full-time), reflecting that many of the respondents worked part-time, measured as up to 35 hours a week. Most respondents were single (64%), while 19% were cohabiting, and 18% were married. Only 32% of respondents were parents.

Full-siblings who are not twins made up roughly two-thirds (67.4%) of the full sample, followed by 11.0% twins, 11.0% step-siblings, and 10.6% half-siblings. The average sibling age-gap is 2.05 years. Older siblings made up about 43% of the sample, followed by 42% younger siblings, 11% twins, and 4% same age siblings who are not twins. Roughly one-fifth of siblings in this sample lived together (21%), while 43% lived within one hour, and 36% lived more than an hour apart from their sibling. Brother-brother (30%) was the most common sibling gender composition, followed closely by sister-sister (29%), sister-brother (22%), and brother-sister (19%) combinations.

For sibling relationship quality, the average score for visits was 2.22 on a 5-point scale (0-4), and the average score for calls and emails was 1.62 on a 5-point scale (0-4). The average score for emotional closeness was 2.95 on a 5-point scale (0-4), and for help and advice, the average score was 1.78 on a 5-point scale (0-4). While the average score for fights was only 1.15 on a 5-point scale (0-4).

There were some differences in sibling relationship quality by sibling type. Although they were included in the analyses, I do not interpret the results for twins. For visits, which I restricted the sample to respondents who did not live with their siblings (n = 1,385), the average

score was 2.37 for full-siblings, 2.43 for half-siblings, and 1.48 for step-siblings. Step-siblings were significantly less likely than full-siblings ($p < .001$), and half-siblings ($p < .001$) to visit each other. The differences in the mean scores for visits across full-siblings and half-siblings were not significant.

For calls and emails, which was also restricted to respondents who did not live with their siblings, the average score was 1.71 on a 5-point scale (0-4) for full-siblings, 1.48 for half-siblings, and 1.02 for step-siblings. Half-siblings ($p < .001$), and step-siblings ($p < .001$), both significantly differed from full-siblings with regard to calls and emails. Step-siblings' calls and emails also differed significantly from half-siblings ($p < .001$). In all, the average scores for the frequencies of calls and emails among siblings not living in the same households were highest for full-siblings followed by half-siblings, then step-siblings.

When examining emotional closeness, the average score was 3.02 on a 5-point scale (0-4) for full-siblings, 2.97 for half-siblings and 2.22 for step-siblings. Step-siblings ($p < .001$) significantly differed from full-siblings in their reports of emotional closeness. While half-siblings' reports of emotional closeness significantly differed from step-siblings ($p < .001$), they did not significantly differ from full-siblings. Full-siblings and half-siblings did not significantly differ in reports emotional closeness, and step-siblings scores were the lowest.

For help and advice seeking, the patterns of variation by sibling type were similar to that for calls and email. The average score was 1.88 on a 5-point scale (0-4) among full-siblings, 1.55 for half-siblings, and 0.86 for step-siblings. Half-siblings ($p < .001$) and step-siblings ($p < .001$) both significantly differed from full-siblings in their reports of help and advice seeking. Additionally, half-siblings significantly differed from step-siblings ($p < .001$). Full-siblings

reported the most help and advice seeking, followed by half-siblings, and then step-siblings reported the lowest scores.

With regard to fights among siblings, the average score was 1.23 on a 5-point scale (0-4) for full-siblings, 1.10 for half-siblings, and 0.62 for step-siblings. Step-siblings ($p < .001$) significantly differed from full-siblings in their reports of fights. Half-siblings differed significantly from step-siblings ($p < .001$) in their reports of fights, but not full-siblings. Full-siblings and half-siblings did not significantly differ in reports of fighting, while step-siblings actually reported the lowest scores.

For sibling relationship quality in adolescence, the average score for "love" was 4.01 on a 5-point scale (1-5) for the full sample, with no significant differences by sibling type (3.99 for full-siblings, 4.09 for half-siblings, and 4.04 for step-siblings). For reports of fights, the average score for the full sample was 3.11 on a 5-point scale (1-5). There were some differences by sibling type: 3.05 for full-siblings and half-siblings, and 3.55 for step-siblings. Compared to full-siblings ($p < .001$) and half-siblings ($p < .001$), step-siblings reported significantly more fighting in adolescence. For time together, the average score for the full sample was 3.10 on a 4-point scale (1-4). Compared to full-siblings ($M = 3.09$), half-siblings ($M = 2.89$, $p < .05$) report spending significantly less time together. Compared to half-siblings, step-siblings ($M = 3.29$, $p < .001$) report spending significantly more time together in adolescence. There were no significant differences between full-siblings and step-siblings in reports of time spent together in adolescence.

Below, the results from the multivariate analyses that examined the association between sibling type and five aspects of sibling relationship quality. (I will provide a table in the discussion section that summarize the results.)

Table 4. Chapter III Descriptive Statistics for Variables for Full Sample and by Sibling Type

	Full sample		By Sibling type										
			Full-		Half-			Step-			Twin		
	100%		67.40%		10.60%			11.00%			11.00%		
Sibling relationship quality at W III	*M*	*SD*	*M*	*SD*	*M*	*SD*		*M*	*SD*		*M*	*SD*	
Visits (0-4)	2.22	0.71	2.37	0.76	2.43	2.01		1.48	1.22	***[c]	2.38	0.57	[f]
Phone calls and emails (0-4)	1.62	0.56	1.71	0.6	1.48	1.25	***	1.02	1.74	***[c]	1.99	0.48	**[cf]
Emotional closeness (0-4)	2.95	0.84	3.02	0.77	2.97	1.02		2.22	2.58	***[c]	3.32	0.05	***[cf]
Help (0-4)	1.78	0.94	1.88	1.06	1.55	2.24	***	0.86	1.78	***[c]	2.43	0.09	***[cf]
Fight (0-4)	1.15	0.77	1.23	0.88	1.10	1.09		0.62	1.13	***[c]	1.49	0.25	**[cf]
Sibling relationship at W II													
Love (1-5)	4.01	0.96	3.99	1.12	4.09	0.92		4.04	1.61		3.98	0.17	
Fights (1-5)	3.11	0.88	3.05	0.78	3.05	1.16		3.55	1.65	***[c]	3.06	0.01	[f]
Time together (1-4)	3.10	0.72	3.09	1.01	2.89	0.42	*	3.29	1.52	[c]	3.30	0.11	***[c]
Controls													
Sibling age gap	2.05	1.14	2.34	1.34	2.74	0.56	***	1.50	2.33	***[c]	0.12	0.05	***
Birth Order													
Older sibling	0.43		0.49		0.59			0.35					
Younger sibling	0.42		0.49		0.38			0.40					
Same age sibling (not twin)	0.04		0.02		0.02			0.26					
Geographic Distance													
Live together	0.21		0.23		0.15			0.11			0.28		
Within one hour	0.43		0.43		0.53			0.50			0.41		
More than one hour apart	0.36		0.34		0.32			0.39			0.31		
Respondent's Characteristics													
Respondent's age	21.83	1.85	21.81	2.61	21.72	1.73		21.92	2.95	*	21.69	0.05	
Respondent's Race/ethnicity													

White	0.66		0.71		0.49			0.56			0.65		
Black	0.17		0.11		0.38			0.28			0.21		
Hispanic	0.08		0.08		0.09			0.05			0.09		
Other race	0.09		0.11		0.05			0.11			0.04		
Sibling gender composition													
Sister-sister	0.29		0.29		0.29			0.31			0.36		
Brother-brother	0.30		0.28		0.32			0.33			0.38		
Brother-sister	0.19		0.20		0.15			0.24			0.11		
Sister-brother	0.22		0.24		0.23			0.12			0.15		
Number of study siblings	1.02	0.59	1.09	0.74	1.05	0.82		0.84	0.84	***[b]	0.98	0.17	*[d]
Statuses													
Respondent's education (1-5)	2.94	0.81	3.05	0.88	2.29	1.87	***	2.55	1.18	***[a]	3.15	0.47	
Sibling's education (1-5)	2.98	0.81	3.01	1.08	2.47	1.71	***	2.87	1.01	[c]	3.12	0.02	[c]
Respondent's work status (1-3)	2.24	0.81	2.26	1.13	2.16	1.76		2.17	1.7	*	2.34	0.11	[e]
Sibling's work status (1-3)	2.28	0.76	2.33	0.97	2.2	1.58	*	2.23	1.02		2.2	0.36	
Respondent's partnership													
Single	0.64		0.66		0.47			0.5			0.7		
Cohabiting	0.19		0.17		0.26			0.25			0.15		
Married	0.18		0.17		0.26			0.25			0.16		
Sibling's partnership													
Single	0.69		0.66		0.62			0.62			0.71		
Cohabiting	0.16		0.15		0.24			0.25			0.16		
Married	0.15		0.18		0.14			0.13			0.13		
Respondent parent	0.32		0.29		0.51			0.42			0.31		
Sibling parent	0.28		0.27		0.30			0.44			0.23		

Differences from full-siblings were significant at *p < .05; ** p <.01; *** p <.001. Differences from half-siblings were significant at [a]p < .05; [b]p <.01; [c]p <.001. Differences from step-siblings were significant at [d]p< .05; [e]p <.01; [f]p <.001.

Table 5. Ordinary-Least-Squared Regression Models Predicting Sibling Relationship Quality at Wave III (N = 1,753).

	Visits						Calls & Emails					
	Model 1			Model 2			Model 1			Model 2		
	b	SE		*b*	SE		*b*	*SE*		*b*	*SE*	
Sibling type												
Half-sibling	-0.16	0.07	*	-0.15	0.07	*	-0.02	0.13		0.00	0.13	
Step-sibling	-0.99	0.05	***[c]	-0.98	0.04	***[c]	-0.59	0.07	***[c]	-0.59	0.06	***[c]
Twins	-0.06	0.09	[cf]	-0.06	0.09	[bf]	0.14	0.08	[cf]	0.13	0.08	[cf]
Sibling relationship at W II												
Love				0.06	0.02	*				0.05	0.02	**
Fights				-0.03	0.02					0.00	0.02	
Time together				0.05	0.02	**				0.08	0.03	**
Controls												
Sibling age gap	0.03	0.01		0.03	0.01		-0.01	0.02		-0.01	0.02	
Birth Order												
Younger sib	-0.29	0.07	**	-0.26	0.07	**	-0.15	0.07		-0.12	0.07	
Same age sibling (not twin)	0.16	0.10		0.17	0.10		-0.34	0.12	**	-0.34	0.12	**
More than one hour apart	-1.46	0.03	***	-1.46	0.03	***	0.02	0.03		0.02	0.03	
Respondent's age	-0.04	0.02	*	-0.04	0.02	*	-0.01	0.01		-0.01	0.01	
Respondent's Race/ethnicity												
Black	0.12	0.03	***	0.10	0.04	**	-0.02	0.06		-0.05	0.07	
Hispanic	-0.06	0.06		-0.06	0.06		-0.05	0.05		-0.06	0.06	
Other race	-0.10	0.03	***	-0.10	0.03	**	0.02	0.03		0.03	0.03	
Sibling gender composition												
Brother-brother	-0.14	0.04	**	-0.11	0.04	**	-0.37	0.04	***	-0.36	0.04	***
Brother-sister	-0.22	0.04	***	-0.18	0.05	**	-0.41	0.06	***	-0.36	0.06	***
Sister-brother	-0.18	0.06	**	-0.17	0.06	**	-0.56	0.05	***	-0.56	0.05	***
Number of study siblings	-0.01	0.03		-0.01	0.03		0.00	0.04		0.01	0.03	

Statuses												
R's education	-0.01	0.01		-0.01	0.01		0.10	0.02	***	0.10	0.02	***
Sibling's education	0.00	0.02		-0.01	0.02		0.09	0.01	***	0.08	0.01	***
R's work status	-0.02	0.02		-0.01	0.02		0.04	0.02		0.05	0.02	**
Sibling's work status	0.05	0.02	*	0.04	0.02		0.14	0.02	***	0.13	0.02	***
Respondent's partnership												
Cohabiting	-0.11	0.03	**	-0.11	0.03	**	-0.14	0.04	***	-0.15	0.04	***
Married	-0.04	0.04		-0.06	0.04		-0.03	0.04		-0.06	0.04	
Sibling's partnership												
Cohabiting	0.02	0.04		0.01	0.04		0.19	0.03	***	0.18	0.03	***
Married	0.01	0.04		-0.01	0.04		0.04	0.04		0.02	0.04	
Respondent parent	0.00	0.03		0.02	0.03		-0.12	0.03	***	-0.09	0.03	**
Sibling parent	0.13	0.07		0.11	0.07		0.15	0.05	*	0.13	0.05	*
Intercept	4.13	0.36	***	3.73	0.35	***	1.40	0.32	***	0.88	0.35	*
R-squared	0.52	***		0.52	***		0.18	***		0.19	***	
N	1,385											

Differences from full-siblings were significant at *p < .05; ** p <.01; *** p <.001. Differences from half-siblings were significant at [a]p < .05; [b]p <.01; [c]p <.001. Differences from step-siblings were significant at [d] p< .05; [e]p <.01; [f]p <.001.

Omitted reference groups include: full-sibling, older sibling, within one hour, respondent White, respondent single, sibling single, respondent non-parent, sibling non-parent.

Table 5. Cont.

	Emotional Closeness						Help & Advice					
	Model 1			Model 2			Model 1			Model 2		
	b	*SE*		*b*	*SE*		*b*	*SE*		*b*	*SE*	
Sibling type												
Half-sibling	-0.05	0.09		-0.02	0.10		-0.18	0.08	*	-0.12	0.10	
Step-sibling	-0.92	0.11	***[c]	-0.94	0.11	***[c]	-0.92	0.06	***[c]	-0.94	0.08	***[c]
Twins	0.14	0.08	[cf]	0.12	0.09	[cf]	0.47	0.09	***[cf]	0.45	0.09	**[cf]
Sibling relationship at W II												
Love				0.18	0.02	***				0.13	0.02	***
Fights				0.06	0.02	***				0.01	0.02	
Time together				0.18	0.03	***				0.26	0.03	***
Controls												
Sibling age gap	-0.02	0.02		-0.03	0.02		-0.01	0.02		-0.02	0.02	
Birth Order												
Younger sib	-0.04	0.07		0.04	0.07		0.04	0.06		0.14	0.07	*
Same age sibling (not twin)	-0.08	0.15		-0.10	0.14		-0.25	0.14		-0.24	0.14	
Geographic distance												
Live together	-0.03	0.05		-0.07	0.06		-0.05	0.05		-0.10	0.05	*
More than one hour apart	-0.05	0.03		-0.04	0.03		-0.22	0.04	***	-0.22	0.04	***
Respondent's age	-0.01	0.02		0.00	0.02		-0.05	0.02	**	-0.04	0.02	*
Respondent's Race/ethnicity												
Black	0.23	0.06	***	0.10	0.06		-0.08	0.05		-0.19	0.06	**
Hispanic	0.19	0.06	**	0.14	0.06	*	0.10	0.06		0.05	0.06	
Other race	-0.02	0.05		0.00	0.05		0.18	0.04	***	0.20	0.05	***
Sibling gender composition												
Brother-brother	-0.18	0.08	*	-0.15	0.08		-0.71	0.08	***	-0.67	0.09	***
Brother-sister	-0.32	0.08	**	-0.21	0.08	*	-0.76	0.06	***	-0.63	0.08	***
Sister-brother	-0.34	0.07	***	-0.36	0.07	***	-0.59	0.06	***	-0.60	0.06	***
Number of study siblings	-0.14	0.06	**	-0.13	0.06	*	-0.03	0.05		-0.01	0.07	

Statuses												
R's education	0.06	0.02	**	0.05	0.02	*	0.06	0.02	**	0.05	0.02	
Sibling's education	0.05	0.03		0.02	0.03		0.10	0.03	**	0.07	0.03	*
R's work status	0.00	0.03		0.04	0.03		0.02	0.02		0.05	0.02	*
Sibling's work status	-0.02	0.03		-0.05	0.04		-0.01	0.04		-0.04	0.04	
Respondent's partnership												
Cohabiting	0.04	0.04		0.02	0.04		-0.04	0.05		-0.07	0.05	
Married	0.12	0.05	*	0.05	0.05		0.03	0.06		-0.06	0.06	
Sibling's partnership												
Cohabiting	0.03	0.04		0.01	0.04		0.11	0.04	**	0.09	0.05	
Married	0.01	0.04		-0.05	0.04		0.05	0.05		-0.02	0.06	
Respondent parent	-0.28	0.05	***	-0.19	0.05	***	-0.34	0.05	***	-0.26	0.06	***
Sibling parent	0.18	0.07	*	0.12	0.06		0.06	0.06		0.00	0.05	
Intercept	3.29	0.45	***	1.82	0.49	**	3.26	0.42	***	1.69	0.47	***
R-squared	0.13	***		0.20	***		0.19	***		0.24	***	
N	1,753											

Differences from full-siblings were significant at *p < .05; ** p <.01; *** p <.001. Differences from half-siblings were significant at [a]p < .05; [b]p <.01; [c]p <.001. Differences from step-siblings were significant at [d] p< .05; [e]p <.01; [f]p <.001.
Omitted reference groups include: full-sibling, older sibling, within one hour, respondent White, respondent single, sibling single, respondent non-parent, sibling non-parent.
"R" indicates respondent

Table 5. Cont.

	Fights					
	Model 1			Model 2		
	b	*SE*		*b*	*SE*	
Sibling type						
Half-sibling	-0.03	0.07		-0.05	0.07	
Step-sibling	-0.46	0.06	***[c]	-0.39	0.05	***[c]
Twins	0	0.06	[f]	0.03	0.06	[f]
Sibling relationship at W II						
Love				0.05	0.02	*
Fights				-0.21	0.01	***
Time together				-0.09	0.03	**
Controls						
Sibling age gap	-0.04	0.02	*	-0.04	0.02	*
Birth Order						
Younger sib	-0.2	0.06	**	-0.19	0.07	*
Same age sibling (not twin)	-0.19	0.12		-0.1	0.13	
Geographic Distance						
Live together	0.26	0.05	***	0.25	0.06	***
More than one hour apart	-0.2	0.03	***	-0.22	0.03	***
Respondent's age	-0.03	0.02		-0.02	0.02	
Respondent's Race/ethnicity						
Black	-0.12	0.04	**	-0.06	0.05	
Hispanic	0.07	0.07		0.13	0.07	
Other race	0.1	0.04	*	0.09	0.05	
Sibling gender composition						
Brother-brother	-0.44	0.05	***	-0.33	0.05	***

Brother-sister	-0.46	0.04	***	-0.42	0.05	***
Sister-brother	-0.17	0.05	**	-0.1	0.05	
Number of study siblings	0.08	0.05		0.05	0.05	
Statuses						
R's education	-0.04	0.01	**	-0.03	0.02	
Sibling's education	-0.04	0.02	*	-0.03	0.02	
R's work status	0.01	0.03		0	0.03	
Sibling's work status	0.02	0.03		0.02	0.03	
Respondent's partnership						
Cohabiting	-0.34	0.05	***	-0.32	0.04	***
Married	-0.09	0.05		-0.08	0.05	
Sibling's partnership						
Cohabiting	-0.2	0.05	***	-0.21	0.06	***
Married	-0.13	0.04	**	-0.12	0.05	*
Respondent parent	-0.14	0.05	**	-0.17	0.05	***
Sibling parent	0.05	0.05		0.06	0.05	
Intercept	2.69	0.39	***	3.12	0.39	***
R -squared	0.14	***		0.18	***	
N			1,753			

Differences from full-siblings were significant at *p < .05; ** p <.01; *** p <.001.
Differences from half-siblings were significant at [a]p < .05; [b]p <.01; [c]p <.001.
Differences from step-siblings were significant at [d] p< .05; [e]p <.01; [f]p <.001.

Omitted reference groups include: full-sibling, older sibling, within one hour, respondent White, respondent single, sibling single, respondent non-parent, sibling non-parent.
“R” indicates respondent

Multivariate Results

Visits. The first aspect of sibling relationship quality examined was visits (Table 3.2). In order to avoid endogeneity, analyses excluded those who lived together with their sibling in young adulthood (analytical subsample N = 1,385). Model 1 tested the association between sibling type and visits and included the sibship characteristics and social demographic control variables. Both half-siblings (b =-0.16 p <.05) and step-siblings (b = -0.99, p <.001) reported fewer visits compared to full-siblings. In supplemental analyses (not shown), I conducted f-tests to examine differences across the sibling types. Compared to half-siblings, step-siblings report significantly less visits with their siblings. Recall that at the bivariate level (Table 3.1), there was no difference between full-siblings and half-siblings in the average score for visits. In the multivariate model, half-siblings reported fewer visits than full-siblings. This was largely due to the inclusion of the social demographic and sibship characteristics in the multivariate models. Respondents' and their siblings' roles and statuses did not significantly influence differences in visits between half-siblings and full-siblings.

Model 2 added three aspects of sibling relationship quality in adolescence to Model 1 to examine whether variation in frequency of visits by sibling type would disappear when sibling relationship quality during adolescence was held constant. As expected, those who reported greater levels of love (b =0.06, p <.05) for their sibling and spending more time with their siblings (b =0.05, P <.01) in adolescence were more likely to report visits with their siblings in young adulthood. The frequency of fights during adolescence was not related to frequency of visits among siblings during young adulthood. When these measures of sibling relationship quality in adolescence—love, time together, and fights—were controlled for, the coefficients for half-sibling and step-sibling changed very little. These findings suggest that regardless of sibling

relationship quality during adolescence, full-siblings were more likely than half-siblings and step-siblings to visit each other during young adulthood. (As mentioned earlier, I do not interpret the results for twins.)

Among control variables, being a younger sibling (b = -0.26, p < .01), living more than one hour apart (b = -1.46, p <..001), respondent's younger than average age (b =-0.04, p <.05), respondents identifying as "other" race (b =-0.10, p <.01), being part of a brother-brother (b =-0.11, p <.01), brother-sister (b =-0.18, p <.01), or sister-brother (b =-0.17, p <.01) dyad, or being in a cohabiting relationship (b =-0.11, p <.01), all had significantly negative influences on visits among siblings, while respondents being Black (b =0.10, p <.01), had a significant and positive influence on reports of visits among siblings.

Calls & Emails. The second aspect of sibling relationship quality was calls and emails (Table 3.2). Again, to avoid endogeneity, analyses excluded those who lived together with their sibling in young adulthood. Model 1 tested the association between sibling type and calls and emails and included the sibship characteristics and social demographic control variables. Step-siblings reported exchanging significantly fewer calls and emails (b =-0.59, p <.001) than full-siblings. There were no significant differences between full-siblings and half-siblings. In supplemental analyses (not shown), I conducted f-tests to examine differences across the sibling types. Half-siblings report exchanging more calls and emails with their siblings than step-siblings.

Note that at the bivariate level (Table 3.1), half-siblings reported fewer calls and emails than full-siblings. The lack of difference between full-siblings and half-siblings was largely because demographic and sibship characteristics were included in the multivariate models.

Respondents' and their siblings' roles and statuses did not significantly influence differences in visits between half-siblings and full-siblings.

Model 2 added three aspects of sibling relationship quality in adolescence to Model 1 to examine whether variation in frequency of calls and emails by sibling type would disappear when sibling relationship quality during adolescent was held constant. As predicted, those who reported greater levels of love for their sibling ($b = 0.05$, $p < .01$) and spending more time together with their sibling ($b = 0.08$, $p < .01$) in adolescence, were more likely to call and email their siblings in young adulthood. Frequency of fights in adolescence was not related to frequency of calls and emails in young adulthood. Again, when measures of sibling relationship quality in adolescence were controlled for, the coefficients for half-sibling and step-siblings changed very little. These findings suggest that regardless of sibling relationship quality during adolescence, full-siblings were more likely than step-siblings to call and email one another during young adulthood.

Among control variables, being a same age sibling who is not a twin ($b = -0.34$, $p < .01$), being part of a brother-brother ($b = -0.36$, $p < .001$), brother-sister ($b = -0.36$, $p < .001$), or sister-brother ($b = -0.56$, $p < .001$) dyad, respondent cohabiting ($b = -0.15$, $p < .001$), and respondent being a parent ($b = -0.09$, $p < .01$), all had a significantly negative influence on the frequency of calls and emails exchanged between siblings. While respondent's education ($b = 0.10$, $p < .001$), sibling's education ($b = 0.08$, $p < .001$), respondent's work status ($b = 0.05$, $p < .01$), sibling's work status ($b = 0.13$, $p < .001$), and sibling cohabiting ($b = 0.18$, $p < .001$), all had a significantly positive influence on the frequency of calls and emails exchanged between siblings.

Emotional Closeness. The third aspect of sibling relationship quality examined was emotional closeness (Table 3.2). Model 1 tested the association between sibling type and reports of emotional closeness in young adulthood and included the sibship characteristics and social demographic control variables. Step-siblings reported less emotional closeness (b =-0.92, p <.001) than full-siblings. There were no significant differences in reports of emotional closeness between full-siblings and half-siblings. In supplemental analyses (not shown), I conducted f-tests to examine differences across the sibling types. Compared to half-siblings, step-siblings report less emotional closeness with their sibling in young adulthood.

Model 2 added three aspects of sibling relationship quality in adolescence to Model 1 to examine whether variation in reports of emotional closeness by sibling type would disappear when sibling relationship quality during adolescent was held constant. As expected, those who reported greater levels of love for their sibling (b =0.18, p <.001) and spending more time together with their sibling (b =0.18, p <.001) in adolescence reported more emotional closeness with their siblings in young adulthood. Somewhat unexpectedly, those who reported more fights in adolescence (b =0.06, p <.001), also reported more emotional closeness in young adulthood. Again, when measures of sibling relationship quality in adolescence were controlled for, the coefficients for half-siblings and step-siblings changed very little. These findings suggest that regardless of sibling relationship quality during adolescence, full-siblings report greater emotional closeness than step-siblings during young adulthood.

Among control variables, being part of a brother-sister (b =-0.21, p <.05), or sister-brother (b =-0.36, p <.001) dyad, number of study siblings (b =-0.13, p <.05), and respondent being a parent (b =-0.19, p <.001) had a significant and negative influence on reports of emotional closeness with one's sibling during young adulthood. While respondents identifying as

Hispanic (b =0.14, p <.05), and respondent's education (b =0.05, p <.05), had a significantly positive influence on the reports of emotional closeness with one's sibling in young adulthood.

Help & Advice. The fourth aspect of sibling relationship quality examined was help and advice (Table 3.2). Model 1 tested the association between sibling types and seeking help or advice from one's sibling, and included the sibship characteristics and demographic control variables. Half-siblings (b =-0.18, p <.05), and step-siblings (b =-0.92, p <.001), reported asking their siblings for significantly less help and advice compared to full-siblings. In supplemental analyses (not shown), I conducted f-tests to examine differences across the sibling types and found that half-siblings asked their siblings for significantly more advice in young adulthood than step-siblings.

Model 2 added three aspects of sibling relationship quality in adolescence to Model 1 to examine whether variation in reports of seeking help and advice from one's sibling, by sibling type would disappear when sibling relationship quality during adolescence was held constant. As expected, those who reported greater levels of love for their sibling (b =0.13, p <.001), and spending more time together with their sibling (b =0.26, p <.001) in adolescence, were more likely to ask their siblings for help and advice in young adulthood. The frequency of fights in adolescence was not significantly related to asking one's sibling for help and advice in young adulthood. When measures of sibling relationship quality in adolescence were controlled for, the coefficients for half-siblings and step-siblings the findings do not change much. However, the difference between full-siblings and half-siblings asking their sibling for help and advice is no longer significant. These findings suggest that regardless of sibling relationship quality during adolescence, step-siblings ask their siblings for less help and advice than full-siblings. Additionally, half-siblings ask their siblings for significantly more advice in young adulthood

than step-siblings. It seems that sibling relationship quality in adolescence may matter more for half-siblings.

Among control variables, living together (b =-0.10, p <.05), living more than one hour apart (b =-0.22, p <.001), respondent's younger than average age (b =-0.04, p <.05), identifying as Black (b =-0.19, p <.01), being part of a brother-brother (b =-0.67, p <.001), brother-sister (b =-0.63, p <.001), or sister-brother (b =-0.60, p <.001) dyad, and respondent being a parent (b =-0.26, p <.001) had a significant and negative influence on reports of asking one's sibling for help and advice in young adulthood. While being a younger sibling (b =0.14, p <.05), identifying as an other race (b =0.20, p <.001), sibling's education (b =0.07 p <.05), and respondent's work status (b =0.05, p <.05) had a significantly positive influence on asking one's sibling for help and advice in young adulthood.

Fights. The fifth and final aspect of sibling relationship quality examined was fights (Table 3.2). Model 1 tested the association between sibling type and fights and included the sibship characteristics and social demographic control variables. Step-siblings report getting in significantly fewer fights with their siblings (b=-0.46, p <.001) compared to full-siblings. There were no significant differences in reports of fights between full-siblings and half-siblings. In supplemental analyses (not shown), I conducted f-tests to examine differences across the sibling types. Compared to step-siblings, half-siblings report significantly more fights with their sibling in young adulthood.

Model 2 added three aspects of sibling relationship quality in adolescence to Model 1 to examine whether variation in reports fights with one's sibling, by sibling type would disappear when sibling relationship quality during adolescent was controlled for. Somewhat unexpectedly, those who reported greater levels of love for their sibling (b =0.05, p <.05) in adolescence were

more likely to fight in young adulthood, while those who fought more during adolescence (b =-0.21, p <.001) and spent more time together during adolescence (b =-0.09, p <.01) were less likely to report fights with their siblings in young adulthood. Again, when measures of sibling relationship quality in adolescence were held constant, the coefficients for half-siblings and step-siblings did not change much. These findings suggest that regardless of sibling relationship quality during adolescence, step-siblings report less fighting than full-siblings during young adulthood.

Among control variables, having a smaller than average age gap (b =-0.04, p <.05), being a younger sibling (b =-0.19, p <.05), living more than one hour apart (b =-0.22, p <.001), being part of a brother-brother (b =-0.33, p <.001) or brother-sister (b =-0.42, p <.001) dyad, respondent cohabiting (b =-0.32, p <.001), sibling cohabiting (b =-0.21, p <.05), sibling being married (b =-0.12, p <.05), and respondent being a parent (b =-0.17, p <.001) had a significant and negative influence on reports of fights with one's sibling in young adulthood. While living together (b =0.25, p <.001) was associated with significantly more fights with one's sibling in young adulthood.

Discussion

This chapter examined the influence of sibling type on sibling relationship quality among young adults, approximately 18-26, while also considering the influence of residential sibling relationship quality in adolescence. I had two hypotheses. The stepfamilies as an incomplete institution perspective (Cherlin, 1978) led me to expect that full-siblings would report better sibling relationship quality (more visits, more calls and emails, more emotional closeness, more seeking help and advice, and fewer fights), than half-siblings and step-siblings. Further, half-siblings would report better sibling relationship quality compared to step-siblings, but not full-

siblings (Hypothesis 1). Additionally, the life course perspective (Elder, 1994) and continuity theory (Fowler, 2009) led me to predict that after controlling for sibling relationship quality in adolescence, differences in sibling relationship in young adulthood would be reduced or disappear (Hypothesis 2). A summary of the findings is presented in Table 3.3. My findings suggest that the stepfamilies as an incomplete institution perspective helps us to understand differences in relationship quality between full-siblings and step-siblings but is less applicable when comparing full-siblings and half-siblings. I did not find support for Hypothesis 2 except for differences in the frequency of help and advice between full-siblings and half-siblings. However, the life course perspective and continuity theory did help to highlight the continuity of sibling relationship quality from adolescence to young adulthood as a closer sibling relationship during adolescence, measured by feelings of love and time spent together, was related to closer sibling relationship, such as more visits, more calls, more advice, and more emotional closeness, during young adulthood.

For the effects of sibling type on visits, my findings support Hypothesis 1. Full-siblings report more visits than half-siblings and step-siblings. Hypothesis 2 did not receive support. Although love for one's sibling and time spent together with one's sibling in adolescence did significantly influence visits, differences in visits across sibling types in young adulthood did not significantly reduce or disappear when these measures in adolescence were included in the model. The finding that full-siblings visit one another more than half-siblings or step-siblings is in line with previous research (White & Riedmann, 1992).

Table 6. Summary of the Findings

	Half-siblings					
	VS. Full-siblings			VS. Step-siblings		
	Bivariate	With Controls	With Relationship Quality at Wave II	Bivariate	With Controls	With Relationship Quality at Wave II
Relationship quality						
Visits[a]		L	L	H	H	H
Calls and emails[a]	L			H	H	H
Emotional closeness				H	H	H
Help and advice	L	L		H	H	H
Fights				H	H	H

	Step-siblings					
	VS. Full-siblings			VS. Half-siblings		
	Bivariate	With Controls	With Relationship Quality at Wave II	Bivariate	With Controls	With Relationship Quality at Wave II
Relationship quality						
Visits[a]	L	L	L	L	L	L
Calls and emails[a]	L	L	L	L	L	L
Emotional closeness	L	L	L	L	L	L
Help and advice	L	L	L	L	L	L
Fights	L	L	L	L	L	L

[a]Only those who lived apart.
"L" indicates lower scores; "H" indicates higher scores.

When examining the effects of sibling type on the frequency calls and emails, Hypothesis 1 received partial support. Full-siblings reported exchanging significantly more calls and emails with their siblings than step-siblings, but did not differ from half-siblings. Hypothesis 2 was not supported. Once again, while love for one's sibling in adolescence and time spent together in adolescence did significantly influence reports of calls and emails, including these adolescent measures of sibling relationship quality in the model did not reduce or disappear the variation in calls and emails by sibling type.

For the effects of sibling type on emotional closeness between siblings, Hypothesis 1 receives partial support. In young adulthood, full-siblings did report significantly more emotional closeness than step-siblings but did not significantly differ from half-siblings in their report of closeness with siblings. Hypothesis 2 was not supported. Similar to what I saw for the frequency of visits or phone calls, while love for one's sibling, fights, and time spent together in adolescence did significantly influence reports of emotional closeness among siblings, these measures or relationship quality in adolescence did not influence variation in emotional closeness by sibling type. The finding that full-siblings report more emotional closeness with their sibling than step-siblings is consistent with past research suggesting that the lack of clearly defined roles and expectations within in stepfamilies may lead to less warmth among step-siblings than among full-siblings (Vogt Yuan, 2009).

When considering the effects of sibling type on asking one's sibling for help and advice, Hypothesis 1 gained support. Both half-siblings and step-siblings report asking their siblings for significantly less help and advice compared to full-siblings. Additionally, Hypothesis 2 gained some support. Once love for one's sibling and time spent together with one's sibling in adolescence were included in the model, the differences between full-siblings and half-siblings

were no longer significant. However, even once adolescent measures of relationship quality were included, significant differences between full-siblings and step-siblings remained.

For the effect of sibling type one fights, Hypothesis 1 was not supported. Half-siblings and full-siblings do not significantly differ in reports of fights in young adulthood. Additionally, step-siblings report significantly *fewer* fights than full-siblings in young adulthood, rather than more fights. As noted earlier, past research suggests that an absence of clearly defined roles and expectations within stepfamilies would involve more conflict among siblings than families with only full-siblings (Vogt Yuan, 2009). However, it may be that siblings who have less contact with one another may fight the least, as the opportunities to quarrel with one another are limited. Further, the lack of contact between siblings may exist to intentionally avoid fights with one's sibling. Past research focusing on couples found that fights are better for relationships than stonewalling, or a lack of response (Gottman, 2008), and fights likely operate similarly in sibling relationships. Hypothesis 2 was not supported with regard to fights.

Overall the pattern of findings suggests that other family characteristics equal, full-siblings who lived together during adolescence report significantly better relationship quality compared to step-siblings who lived together during adolescence but do not differ much from half-siblings who lived together during adolescence. Therefore, Hypothesis 1, which was drawn from the stepfamilies as an incomplete institution perspective was fully supported with regard to step-siblings but earned very limited support with regard to half-siblings. For example, compared to full-siblings, step-siblings reported fewer visits, fewer calls and emails, less emotional closeness, and asking their siblings for less help and advice. However, step-siblings also reported fighting with their siblings significantly less often than full-siblings. Although half-siblings report significantly fewer visits with their sibling in young adulthood than full-siblings, there

were no significant differences between full-siblings and half-siblings in four other aspects of sibling relationship quality that were examined in these analyses. My findings suggest that other family characteristics equal, relationships among half-siblings who lived together during adolescence are much more similar to relationships among full-siblings that lived together during adolescence than relationships among step-siblings that lived together during adolescence. It may be that half-siblings are more successful at attaching meaning and significance to their sibling relationships than step-siblings. It may also be that sharing at least one biological parent provides siblings with much more "institutionalization" or shared expectations and a sense of obligations with each other compared to not sharing any parents (i.e., step-siblings). Whatever the cause, the limited differences in relationship quality between half-siblings and full-siblings who lived together during adolescence seem to suggest that relationships among half-siblings who lived together during adolescence may be as institutionalized as relationships among full-siblings who lived together during adolescence.

Hypothesis 2, which predicted, on the basis of the life course perspective and continuity theory, that differences in sibling relationship quality across full-, half-, and step- siblings would disappear when their relationship quality in earlier life stage (i.e., during adolescence) was controlled for, received quite limited support. The idea of continuity in sibling relationship quality from adolescence to young adulthood was supported: Having more love for one's residential sibling in adolescence was significantly associated with more visits, more calls and emails, more emotional closeness, asking for more help and advice, as well as, more fights among siblings in young adulthood. Fights with one's residential sibling in adolescence were significantly associated with more emotional closeness and fewer fights in young adulthood. Time spent together with one's residential sibling in adolescence was significantly associated

with more visits, more calls and emails, more emotional closeness, asking one's sibling for more help and advice, and fewer fights in young adulthood. However, including the adolescent sibling relationship quality measures did not change variation in sibling relationship quality in young adulthood across siblings, except for one instance: the finding that half-siblings seek help and advice from their siblings less often than full-siblings during young adulthood became non-significant when relationship quality during adolescence was controlled for.

One important contribution of this research is that I examined half-siblings and step-siblings separately, comparing their relationship qualities with those among full-siblings, as well as, comparing half-siblings and step-siblings to each other. Most research seems to group half-siblings and step-siblings together in their analysis. However, based on the current study we see that although step-siblings do seem to differ from full-siblings in reports of relationship quality, the same cannot be said for half-siblings. In fact, in contrast to some prior research findings (Mikkelson et al., 2011; Vogt Yuan, 2009), my findings suggest that other family characteristics equal, relationships between full-siblings who lived together during adolescence and half-siblings who lived together during adolescence may be more similar than researchers have assumed.

The present analysis has limitations that future research should address. I examined the five aspects of relationship quality separately. It is worth noting that the five dependent variables are correlated with one another. Future research should examine how different aspects of relationship quality are correlated and how such patterns may vary by sibling type. The present sample was not representative of young adults and siblings in the U.S. general population, although it does include both the respondents' and their siblings' life course statuses and other characteristics, which other large-scale, longitudinal national data did not provide. Unfortunately,

Wave IV of Add Health, when respondents are 24-32 years of age, did not ask sibling relationship quality questions, therefore I was unable to use a more recent wave of the data in my analyses. The sample is dated (2001-2002) and may not fully capture the current nature of contact between siblings, given the rise in cell phone usage and media in the past 20 years. For example, Fingerman and colleagues (2012) found that among parents and their children, 18-24, there is more involvement in each other's lives than those 30 years prior, to the point that these parents and their children tend to talk on the phone with one another at least once a week. Perhaps this means that young adults today would also have more contact with their siblings through texting and social media use than young adults 20 years ago.

Due to the large number of mismatches between Waves II and III in the focal siblings with whom the respondent answered questions about their relationship quality, I was unable to examine the influences of sibling type on changes in sibling relationship quality fully, even though I controlled the analysis for residential sibling relationship quality in adolescence. Respondents were limited to young adults who lived together with their sibling during their adolescent years, therefore the analyses did not include those who grew up with non-residential siblings or who had residential siblings who were significantly younger or older than them during their adolescent years. Additionally, there were some important measures that were missing among many of the respondents that could not be included in the analyses, such as a measure indicating whether the respondents' parental figures in adolescence were still together in young adulthood. Future research that analyzes a more representative sample of sibling dyads would help us to better understand the association between sibling type and sibling relationship quality. Another improvement for future research examining relationship quality would be to measure relationship quality based on multiple questions, rather than single-item measures, like

the current study. Future research may also benefit from focusing on twins as I did see some variation between twins and other sibling types, but did not focus on twins in my analyses.

In conclusion, sibling relationships are unique, as they tend to be particularly important, long lasting, and egalitarian relationships. The current analysis examined various aspects of sibling relationship quality – visits, calls and emails, emotional closeness, seeking help and advice, and fights – during young adulthood, a time in the life course when siblings generally begin living apart and relationships with one's sibling become more likely to be relationships of choice. Half-siblings who lived together during adolescence report fewer visits than full-siblings who lived together during adolescence, but otherwise do not differ from full-siblings in reports of sibling relationship quality. However, step-siblings who lived together in adolescence differ from full-siblings that lived together in adolescence in all 5 aspects of relationship quality, with full-siblings reporting more visits, more calls and emails, greater emotional closeness, more help and advice seeking, and more fights. In all, the results offer partial support for the stepfamilies as an incomplete institution perspective, and little support for the life course perspective and continuity theory. Future research is warranted to better understand the longitudinal relationship between sibling type and sibling relationship quality.

CHAPTER IV. SIBLING RELATIONSHIP QUALITY, MENTAL HEALTH, AND SELF-CONCEPT: THE EFFECTS OF SIBLING TYPE

Young adulthood is a period in the life course that is associated with many changes and transitions that can be stressful, such as leaving one's household of origin, going away to college, starting a career, entering romantic relationships, and becoming a parent (Conger & Little, 2010). This period is also a time in life course when individuals tend to more fully develop and explore their identities and independence (Arnett, 2000). During this new and stressful period of life, an individual's mental health and self-concept may be particularly vulnerable. Much research has shown that emotional support from people in close relationships helps individuals deal with stressful circumstances (e.g., Thoits, 2011; Umberson & Montez, 2010). Most of such research has largely focused on the effects of parent-child relationships on young adults' mental health (e.g., Needham, 2008; Wilkinson & Andersson, 2018), leaving the role of sibling relationships in influencing individuals' self-concept and mental health less investigated. This is an important area of research to extend, as sibling relationships are more common, long lasting, and flexible, than most other relationships throughout the life course (e.g., Milevsky & Heerwagen, 2013; Stocker et al., 1997) and therefore are likely to play an influential role in influencing an individual's well-being. Most existing studies that have considered siblings' influence on mental health and self-concept in young adulthood relied on cross-sectional data from convenience samples of college students or non-college students in the local area (e.g., Milevsky, 2005; Sherman et al., 2006; Stocker et al., 1997) with a limited number of studies using longitudinal data (e.g., Finan et al., 2018; Guan & Fuligni, 2015; Petit et al., 2011). It is important to analyze how residential sibling relationship quality in adolescence— feelings of love, fights, and time spent together — is related to mental health and self-concept during the transition to adulthood

using longitudinal data of a more diverse sample. It is also imperative to use the life course perspective to examine the idea that an earlier life experience influences one's mental health and self-concept in later life (Elder, 1994).

I am particularly interested in whether close relationships among siblings benefit individuals' mental health and self-concept to the same extent across sibling types (i.e., full-, half-, or step- siblings). In Chapters II and III, where I examined variation in sibling relationship quality by sibling type during adolescence and young adulthood respectively, I argued that it is important to understand such variation, because sibling relationship quality likely matters for young people's mental health (pp. 2, 7, 50). Yet, past research has not examined this key question—Does relationship quality with half-siblings or step-siblings influence young adults' mental health and self-esteem just as relationship quality with full-siblings influences mental health and self-esteem? As discussed earlier, half-siblings and step-siblings have become a more common experience among the younger populations of U.S. individuals (Kreider & Ellis, 2011). Stepfamilies, as well as blended families which include half-siblings, remain less institutionalized, as Cherlin (1978) pointed out, and thus the efficacy of half-sibling or step-sibling relationships for young adults' mental health may differ from that of full-sibling relationships. Therefore, it is important to consider how sibling type might influence the association between sibling relationship quality and mental health/self-concept, for better or for worse.

In this chapter, using unique sibling data from Waves II and III of the National Longitudinal Study of Adolescent to Adult Health (N = 1,753), I examine the association between three aspects of sibling relationship quality in adolescence— feelings of love, frequency of fights, and time spent together—and reports of depression and self-esteem in young adulthood

(i.e., 18 to 26 years of age). I draw from the life course perspective (Elder, 1994) and attachment theory (Ainsworth, 1989; Lindell & Campione-Barr, 2017; Whiteman, McHale, & Soli, 2011) to conceptualize the association between sibling relationships in adolescence and depression and self-esteem in young adulthood. Drawing from the incomplete institutionalization perspective (Cherlin, 1978), I examine whether the association varies by sibling type. I address the following questions: (a) What is the association between sibling relationship quality in adolescence (feelings of love, fights, and time spent together) and reports of depression and self-esteem in young adulthood? (b) Does the association between sibling relationship quality in adolescence and reports of depression and self-esteem in young adulthood vary depending on sibling type?

Literature Review

The Link Between Sibling Relationship Quality in Adolescence and Mental Health in Young Adulthood

Social relationships are a key component influencing individuals' mental health and self-concept (Thoits, 2011). The influence of these social relationships depends on both the quality and the structural features (e.g., strength and type of relationship) of the relationships. The significant effects of social relationships on mental health can be positive or negative and can shape mental health outcomes throughout the life course (Umberson & Montez, 2010). Prior research has found that it can be beneficial for individuals to experience supportive sibling relationships during the transition to young adulthood (Conger & Little, 2010; Milevsky, 2005; Milevsky et al., 2005; Van Volkom et al., 2011). During young adulthood, when young people begin living away from their siblings, siblings can serve as a source of friendship, support, and love (Van Volkom et al., 2011) but also as a source of conflict (Milevsky et al., 2005). One study, using a sample of 247 college students and 58 non-college students, found that support

from siblings was associated with lower depression and that sibling support compensated for low support from mothers and friends for depression (Milevsky, 2005). These studies largely used cross-sectional data and examined current sibling relationship quality and mental health. Much less is known as to whether sibling relationships in adolescence, such as feeling of love, fighting, and spending time together, matter longitudinally for depressive symptoms and self-esteem in young adulthood, especially while using unique, longitudinal data that allows siblings to be paired.

The life course perspective, which considers the continuity and change that individuals experience throughout the life span, suggests that there are lasting effects of experiences or relationship patterns in earlier life stages on subsequent life stages (Elder, 1994). Past research that uses this idea largely focuses on changes in parent-child relationship quality from adolescence into early adulthood and finds more continuity than change in these relationships (e.g., Aquilino, 1997). Similar results of continuity and change have been found when examining sibling relationship quality (Guan & Fuligni, 2015; Lindell & Campione-Barr, 2017). Thus, it is important to consider the longitudinal effects of sibling relationship quality in adolescence on mental health and self-concept in young adulthood.

Attachment theory also helps conceptualize how sibling relationship quality in adolescence influences young adults' mental health and self-esteem. While attachment theory initially focused on the attachment between infants and their mothers or caregivers for survival (Ainsworth, 1989; Whiteman, McHale, & Soli, 2011), later research applied this theory more broadly to various relationships that constitute an affectional bond across different stages in the life course (e.g., Ainsworth, 1989; Guan & Fuligni, 2015; Lindell & Campione-Barr, 2017; Whiteman, McHale, & Soli, 2011). Affectional bonds are characteristic of the individual, rather

than the dyad, and are not interchangeable with other relationships. Affectional bonds are also long lasting and develop specifically between two individuals based on the history of their interactions (Ainsworth, 1989). Attachment represents a deep bond and source of emotional security (Whiteman, McHale, & Soli, 2011). A small body of research has used attachment theory when analyzing sibling relationships (e.g., Ainsworth, 1989; Lindell & Campione-Barr, 2017; Whiteman, McHale, & Crouter, 2011). These affectional bonds with or attachments to a sibling can serve to reduce the experience of depression (e.g., Guan & Fuligni, 2015; Milevsky, 2005) and bolster one's self-esteem (e.g., Guan & Fuligni, 2015; Milevsky, 2005; Sherman et al., 2006). This dissertation uses sibling relationship quality in adolescence (i.e., feelings of love, fights, time spent together) as a proxy for the affectional bonds discussed with attachment theory.

Limited research has considered the influence of sibling relationships using attachment theory while considering the longitudinal effects of the sibling relationship quality or attachments in adolescence and their influence on mental health and self-concept in young adulthood. One longitudinal study (N=372) interviewed adolescents from the mid-Atlantic U.S. in 2007, 2008, and 2009, and then once more in 2014 when respondents were young adults (Finan et al., 2018). Finan and colleagues found that for siblings, among girls, low levels of warmth and hostility and among boys, low levels of hostility, were associated with increases in depressive symptoms in adolescence, followed by steep declines in depressive symptoms in young adulthood. However, high levels of warmth and hostility among girls and high levels of hostility among boys were associated with steep declines in depressive symptoms in adolescence followed by modest increases in depressive symptoms in young adulthood (Finan et al., 2018). Petit and colleagues (2011) found similar results of decreased depressive symptoms, in addition to increased social support among their sample of young adults (N =816) who experienced up to

eight assessment waves from the ages of 21-30. Overall, higher levels of perceived social support from families (parents, spouse, siblings, or children) were associated with slower decreases in depressive symptoms over time among women, while higher initial levels of depressive symptoms were associated with gradual increases in perceived social support from family over time, among men (Petit et al., 2011).

Respondents from another longitudinal study (N = 600) completed questionnaires in 12th grade as well as 2 and 4 years after high school (Guan & Fuglini, 2015). The authors found that sibling support remained relatively stable and that higher levels of support from families (parents and siblings) was associated with greater self-esteem and lower levels of depression (Guan & Fuglini, 2015). Hollifield and Conger (2015) used the Family Transitions Project (N = 337) and found that sibling support at age 17 was significantly associated with individuals' reports of autonomy, competence, and relatedness at age 19, as well as, life satisfaction at age 20. These studies reflect the importance of considering familial relationship quality in adolescence, especially sibling relationship quality, when analyzing mental health and self-concept in young adulthood.

Variation by Sibling Type

The second question I examine in this chapter is whether the association between sibling relationship quality in adolescence and mental health and self-concept in young adulthood differ between half-siblings or step-siblings compared to full-siblings. To conceptualize potential variation by sibling type in the effects of sibling relationship quality on young adults' mental health and self-esteem, I rely on Cherlin's (1978) idea of stepfamilies as an *incomplete institution*. In the United States, even though stepfamilies and blended families, which include half-siblings, have been common, there are no institutionalized norms, expectations, and

language to guide individuals' interactions and relationships within stepfamilies. This can make relationships among stepfamily members particularly complex and challenging, as stepfamily members need appropriate terms for their roles if they are to attach expectations, symbols, and meaning to these roles (Cherlin, 1978). Unlike families with only full-siblings, families that include half-siblings and step-siblings do not have the same cultural and institutional support. For example, when it comes to parental rights, stepfamilies do not hold the same legal standing as traditional nuclear families. Further, families with two biological parents and their children only can generally assume that they will all be together to celebrate holidays, vacations, and special occasions, while families with half-siblings and step-siblings generally have to consider custody or visitation schedules when planning for such occasions. Without the institutional support, the social ties between half-siblings and step-siblings are not generally as simple or secure as those of full-siblings. Relationships among kin tend to be regulated by cultural practices and shared familial experiences (Ainsworth, 1989). Some step- or blended families, however, can adapt to their new family roles and establish warm relationships among family members over time (e.g., Bray, 1999; Vogt Yuan, 2009). As discussed in Chapter II, family characteristics, such as mother-child relationship quality, father-child relationship quality, family belonging, and residential parent type may influence half-sibling and step-sibling relationship quality (see Chapter II for more discussions).

The lack of institutional norms leads to two different predictions as to how the quality of half-sibling or step-sibling relationships may influence young adults' mental health and self-esteem differently from full-sibling relationships. First, the lack of institutional support may mean that the benefit of close half-sibling or step-sibling relationships that help enhance young adults' mental health and self-esteem is weaker than that of close full-sibling relationships, even

if these half-siblings or step-siblings were able to form close relationships in adolescence. Without norms that half-siblings or step-siblings should keep looking after one another after they get into adulthood, close relationships they established in adolescence may not be secure enough to forge attachment that can work as a coping resource to enhance mental health. Therefore, I expect that positive sibling relationship quality, specifically reports of love and time spent together in adolescence, will significantly decrease reports of depressive symptoms and bolster reports of self-esteem in young adulthood, more so for full-siblings who experience more secure and normalized familial expectations and behaviors, than for half-siblings who experience less familial institutionalization and step-siblings who tend to lack well established and structured patterns of familial expectations and behaviors (Hypothesis 2a).

It is also possible that residential step-siblings and residential half-siblings do form close bonds and attachments during adolescence, despite a lack of institutionalized norms to guide behaviors, norms, and expectations. If half-siblings and step-siblings do successfully form close bonds and attachments with one another, they may particularly cherish these attachments, rather than take them for granted. Through intentionally navigating the obstacles that come within stepfamilies and blended families in order to form close family relationships, sibling relationships in these families may become especially important. Additionally, sometimes step-parents are referred to as "bonus" parents, and it may be that some respondents see their half-siblings and step-siblings who they grew up with during adolescence as "bonus" siblings or as special relationships. Second, and in contrast to the first prediction, when half-siblings and step-siblings do successfully attach meanings and expectations to their familial roles in adolescence, despite the lack of institutional norms, such close relationships may foster better mental health and self-esteem in young adulthood more so than close relationships with full-siblings may.

Thus, I expect that positive sibling relationship quality, specifically reports of love and time spent together in adolescence, represent security and attachment, especially among half-siblings and step-siblings, and will significantly bolster self-esteem and decrease reports of depressive symptoms in young adulthood for half-siblings and step-siblings more so than full-siblings (Hypothesis 2b).

Other Factors Related to Sibling Relationship Quality and Mental Health

Prior research examining sibling relationship quality during adolescence and mental health or self-concept in young adulthood has identified several factors as predictors of sibling relationship quality or mental health/self-concept. These factors include: respondent's gender, respondent's age (Finan et al., 2018; Guan & Fuligni, 2015; Hollifield & Conger, 2015; Petit et al., 2015), respondent's race/ethnicity (Guan & Fuligni, 2015; Petit et al., 2015), age gap between siblings, older/younger sibling status, gender composition of the sibling dyad (Finan et al., 2018; Hollifield & Conger, 2015), respondent's romantic relationship status, respondent's parental status (Guan & Fuligni, 2015; Spitze & Trent, 2018), respondent's educational status (Petit et al., 2015), and respondent's income/work status (Petit et al., 2015; Spitze & Trent, 2018). Additionally, geographic distance (Milevsky et al., 2005), and presence of full-siblings (White & Riedmann, 1992) are known to be predictors of sibling relationship quality in young adulthood.

Recent studies looked at how sibling relationship quality is influenced by life events in young adulthood such as educational attainment, forming partnerships, employment and becoming parents (Aldrich et al., 2018; Spitze & Trent, 2018). Results suggest that college education is related to more visits, more calls or emails, more help seeking, and more emotional closeness among siblings (Aldrich et al., 2018). Partnered respondents reported fewer visits

(Aldrich et al., 2018; Spitze & Trent, 2018), and single respondents whose siblings are partnered reported more calls and emails and fewer fights (Aldrich et al., 2018). Romantic partnership, overall, was associated with fewer fights between siblings (Aldrich et al., 2018). Employment and the transition from part-time to full-time work was associated with a decline in sibling visits, for the one sample (Spitze & Trent, 2018). While Aldrich and colleagues (2018) found that respondents who were employed full-time exchanged more calls and emails with their sibling, although they reported fewer fights and less emotional closeness with their sibling. However, if the respondent worked more hours than their sibling they reported exchanging fewer calls and emails, and fewer fights. Childless respondents whose siblings have children reported more visits and more emotional closeness, while parent respondents with childless siblings reported less help seeking (Aldrich et al., 2018). Those who remained childless were more likely to experience exchanges of support (Spitze & Trent, 2018). Thus, I will control for education, romantic partnership, work status, and parental status, in young adulthood.

The Present Study

Past research has found that social ties or attachments are important for individual's mental health and self-concept (Guan & Fuligni, 2015; Milevsky, 2005). Although we know that sibling relationship quality can influence an individual's mental health and self-concept (Guan & Fuligni, 2015; Milevsky, 2005), limited research has examined the longitudinal effects of sibling relationship quality in adolescence on mental health and self-concept in young adulthood (Finan et al., 2018; Guan & Fuligni, 2015; Petit et al., 2011). Additionally, the existing body of research has not considered the possibility that the association between sibling relationship quality in adolescence and mental health or self-concept in young adulthood may depend on sibling type (half-, step-, full-). Using the life course perspective (Elder, 1994), attachment theory

(Ainsworth, 1989; Lindell & Campione-Barr, 2017), and stepfamilies as an incomplete institution (Cherlin, 1978) I present the following hypotheses.

Hypothesis 1: Individuals who report better sibling relationship quality in adolescence (greater reports of love, fewer fights, and spending more time together) will report lower depressive symptoms and better self-esteem in young adulthood, compared to individuals with less favorable sibling relationship quality in adolescence.

Hypothesis 2a: The association between positive sibling relationship quality in adolescence and reports of lower depressive symptoms and reports of higher self-esteem in young adulthood will be strongest for full-siblings, compared to half-siblings and step-siblings.

Hypothesis 2b: The association between positive sibling relationship quality in adolescence and reports of lower depressive symptoms and reports of higher self-esteem in young adulthood will be stronger for half-siblings and step-siblings, than for full-siblings.

Analyses will control for possible confounding factors including: respondent's gender, respondent's age (Finan et al., 2018; Guan & Fuligni, 2015; Hollifield & Conger, 2015; Petit et al., 2015), respondent's race/ethnicity (White, Black, Hispanic, other race) (Guan & Fuligni, 2015; Petit et al., 2015), age-gap between siblings, birth order (older vs. younger), gender composition of the sibling dyad (sister/sister, sister/brother, brother/brother) (Finan et al., 2018; Hollifield & Conger, 2015) respondents' relationship status, parental status (Guan & Fuligni, 2015; Spitze & Trent, 2018), education level, and employment level (Petit et al., 2015), as well as their siblings' statuses (Aldrich et al., 2018), geographic distance between siblings in young adulthood (Milevsky et al., 2005), and reports of depression or self-esteem in adolescence.

Method

Data

The National Longitudinal Study of Adolescent to Adult Health (Add Health) provided a nationally representative sample of students in grades 7-12 in 1995 (http://www.cpc.unc.edu/projects/addhealth). It is comprised of a stratified, random sample of all high schools in the United States. Eligible schools had an 11th grade and at least 30 enrolled students, or were a feed school that had a 7th grade that sent students on to high school. Wave I was collected in 1995 when the respondents were 12 to 17 years; and 20,745 students participated in the Wave I in-depth at home interviews. All adolescents in grades 7 through 11 in Wave I and 12th graders who were part of the siblings subsample were re-interviewed in 1996 for the Wave II in-home interviews (n = 14,738, 88.6%). Wave III was collected in 2001 and 2002 when the respondents were 18-26 years old and 15,197 (approximately 77%) participants were retained from the first wave of data collection (Harris et al., 2013).

The sample of young adults used in the present analyses was drawn from the sibling sample in Wave III, that was originally collected in Wave I; the sibling-pair sample is comprised of adolescents who reported having a twin, half-sibling, step-sibling, adopted sibling, or foster sibling between 11 and 20 years of age living in the household (Harris et al., 2013). Additionally, a probability sample of full-sibling pairs from all adolescents in the survey were included. Both siblings in the pair participated in the in-home interviews as individual respondents, and one home could have multiple sibling pairs in the sample. The siblings sample in Wave I included 3,114 sibling dyads (i.e., 6,228 respondents). In Wave II, 2,218 sibling dyads (i.e., 4,4,36 respondents) were re-interviewed. As prior research has identified (e.g., McHale et al., 2009), there were a large amount of missing information in the Wave I sibling pairs sample. Therefore, we use Wave II, instead of Wave I, to measure sibling relationship quality in adolescence as a

moderating variable. In Wave III, the sibling data included 4,367 respondents who were in the sibling pairs sample in Wave II, but due to the survey design the data are no longer paired in Wave III (Carolina Population Center, 2003).

To select my sample, I first removed 13 cases from the 4,367 respondents in Wave II sibling pairs sample, as the respondent ID and the sibling ID were identical (n = 4,354). Next, I looked to select respondents whose focal siblings were the same ones between Waves II and III. In both Waves II and III, respondents were asked to evaluate the quality of their relationship with each of their residential siblings including those who were not in the sibling pairs sample; and the focal sibling on whom the respondents answered when they were asked about the quality of relationships with their siblings were not always the same ones between Waves II and III. Using both the respondent IDs and the sibling IDs, I found that of the 4,354 respondents, 2,463 respondents reported on relationship quality with the same siblings in Waves II and III. After excluding those with missing cases in any variable of the analyses, the sample was further reduced to n = 2,129. Finally, excluding 376 cases which did not have values in the weight variable (i.e., who were not in the core-longitudinal sample; Chen & Chantala, 2014), the analytical sample size was N = 1,753.

Although this sample is not representative of young adults and siblings in the U.S. general population, there has not been a comparable large-scale longitudinal, U.S. sibling pair designs like the one Add Health presents (Harris et al., 2013).

Dependent Measures

The dependent variable, mental health in young adulthood, included measures for both depressive symptoms and self-esteem. *Depressive symptoms* were measured as the average of eight items (α = .70) of the modified version of the Center for Epidemiological Studies'

Depressive Symptoms Scale (CES-D; Radloff, 1977; Vogt Yuan, 2009). "How often was the following true during the past week?" (a) "You felt depressed." (b) "You felt sad." (c) "You felt that people disliked you." (d) "You felt that you could not shake off the blues, even with help from your family and your friends." (e) "You felt that you were too tired to do things." (f) "You felt you were just as good as other people." (g) "You had trouble keeping your mind on what you were doing." (h) "You were bothered by things that don't usually bother you." (0= *never or rarely*, 1= *sometimes*, 2 = *a lot of the time*, 3 = *most of the time or all of the time*).

Self-Esteem was measured as the average of four items (α = .78), including: "Do you agree or disagree with the following statement?" (a) "You feel like you are doing everything just about right." (b) "You have a lot of good qualities." (c) "You have a lot to be proud of." (d) "You like yourself just the way you are." (1 = *strongly disagree,* 2 = dis*agree*, 3 = *neither agree nor disagree*, 4 = *agree*, 5 = *strongly agree*,). The scale ranged from 1-5.

Independent Measures

Three aspects of *sibling relationship quality in adolescence,* feelings of love, frequency of fights, and time together, measured in Wave III served as the independent measures. *Emotional closeness* was measured by the question, "How often do you feel love for {Name of the focal sibling}?" (1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often). *Frequency of fights* was measured by the question, "How often do you and {Name of the focal sibling} quarrel or fight?" (1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often). *Frequency of time spent together* was measured by the question, "How much time do you and {Name of the focal sibling} spend together?" (1 = none, 2 = a little, 3 = some, 4 = a lot).

Sibling relationship type was comprised of four dummy variables indicating whether the respondents' sibling is (a) full- (reference), (b) half-, (c) step-, and (d) twins. As the focus of this

chapter is on half-siblings or step-siblings compared with full-siblings who are not twins, I do not focus on differences between twins and non-twins or differences between twins and half-siblings or step-siblings.

Control Measures

Age gap between siblings was measured as the older sibling's age subtracted by the younger sibling's age. *Birth order* was comprised of four dummy variables including (a) older (reference), (b) younger, (c) same age (not twins), and (d) twins. Gender composition of the sibling dyad was comprised of four dummy variables, (a) both the respondents and siblings are women (sister/sister, reference), (b) both the respondents and siblings are men (brother/brother), (c) respondents are men and siblings are women (brother/sister), and (d) respondents are women and siblings are men (sister/brother). Geographic distance between siblings in young adulthood was measured by the question, "How far in travel time do you and he/she live from one another?" Because living together might be qualitatively different from living apart even if they lived within a ten-minute distance, I created three dummy variables including (a) live together (reference), (b) within an hour apart, and (c) an hour or more. The respondent's age was measured in years. The respondent's race/ethnicity was comprised of four dummy variables indicating whether the respondent identifies as (a) White (reference), (b) Black, (c) Hispanic, or (d) other races.

The roles and status of respondents and their siblings were measured in young adulthood (Wave III). Both the respondents' and their siblings' *education status* were comprised of five dummy variables: (a) less than high school, (b) high school diploma/GED (reference), (c) some college, (d) in college, and (e) B.A. and beyond. Both the respondents' and their siblings' *employment status* was comprised of three dummy variables: (a) unemployed, (b) part-time (less

than 35 hours weekly), and (c) full-time (35 hours or more weekly), measured by the question, "How many hours a week do you usually work at this job?" Both the respondents and their siblings' relationship status were measured using three dummy variables: (a) single (reference), (b) cohabiting, and (c) married. *Parental status* was measured using a dichotomous variable where those with any children in the home were coded as 1 and others were coded as 0.

Depression in adolescence, was measured in Wave II as the average of the same eight items ($\alpha = .70$), of the modified version of the Center for Epidemiological Studies' Depressive Symptoms Scale (CES-D; Radloff, 1977; Vogt Yuan, 2009) that was used to measure *depressive symptoms* in young adulthood. The scale ranged from 0 to 3. *Self-esteem in adolescence* is measured as the average of the same four items ($\alpha = .81$), that were used to measure *Self-Esteem* in young adulthood. The scale ranged from 1 to 5.

Analytic Strategy

I used ordinary-least-squared (OLS) regression models to examine the association between the three aspects of sibling relationship quality in adolescence (feelings of love, fights, and time spent together) and reports of depressive symptoms and self-esteem in young adulthood. The nonindependence sampling design (i.e., school-based) of Add Health as well as the matched sibling sample (i.e., two siblings share the same household characteristics) required a statistical correction to account for standard inflation. Therefore, all analyses used SAS PROC Surveymean and PROC Surveyreg and were weighted to account for sampling design and standard error inflation (Siller & Tompkins, 2006).

Two models were examined for each outcome. Model 1 examined the association between relationship quality in adolescence and reports of depression and self-esteem in young adulthood and included all social demographic and sibship characteristic control variables.

Model 2 examined the association between relationship quality in adolescence and reports of depression and self-esteem in young adulthood and added in interactions between sibling type and residential sibling relationship quality in adolescence.

Results

Descriptive Results

Table 4.1 presents descriptive statistics for all variables use in the analyses. The average age of respondents was 21.83 years. Two-thirds of the sample identified as White (66%), followed by 17% Black, 8% Hispanic, and 9% identified as other races. The average level of education among respondents was 2.94 on a 5-point scale, reflecting that most of the respondents have at least a high school diploma or GED and many have at least some college. Respondents' average work status was 2.29 on a 3-point scale, (1 = nonemployed, 2= employed part-time, and 3 = employed full-time), reflecting that many of the respondents worked part-time, measured as up to 35 hours a week. A majority of the respondents were single (64%), while 19% were cohabiting, and 18% were married. Only 32% of respondents were parents.

For depression in young adulthood, the average score was 0.69 on a 4-point scale (0-3), reflecting low levels of depression. The average score for self-esteem in young adulthood was 4.22 on a 5-point scale (1-5), which reflects relatively high levels of self-esteem.

For depression in adolescence, the average score was 0.76 on a 4-point scale (0-3), reflecting relatively low levels of depression. The average score for self-esteem in adolescence was 4.17 on a 5-point scale (1-5), which reflects generally high levels of self-esteem.

Table 7. Chapter IV Descriptive Statistics

	M	*SD*		*M*	*SD*
Depression & Self-Esteem at W III			Sibling age gap	2.07	1.14
Depression (0-3)	0.69	0.48	*Geographic Distance*		
Self-Esteem (1-5)	4.22	0.58	Live together	0.20	
Sibling relationship quality at W II			Within one hour	0.45	
Love (1-5)	4.02	0.95	More than one hour apart	0.36	
Fights (1-5)	3.12	0.89	*Respondent's characteristics*		
Time Together (1-4)	3.10	0.72	Respondent's age	21.83	1.85
Controls			*Respondent's Race/ethnicity*		
Depression & Self-Esteem at Wave II			White	0.66	
Depression (0-3)	0.76	0.3	Black	0.17	
Self-Esteem (1-5)	4.17	0.53	Hispanic	0.08	
Sibling Type			Other race	0.09	
Full-sibling	0.68		*Statuses*		
Half-sibling	0.11		Respondent's education (1-5)	2.94	0.76
Step-sibling	0.11		Sibling's education (1-5)	2.98	0.81
Twins	0.11		Respondent work status (1-3)	2.24	0.81
Sibling gender composition			Sibling's work status (1-3)	2.29	0.76
Sister-sister	0.29		*Respondent's partnership*		
Brother-brother	0.30		Single	0.64	
Brother-sister	0.19		Cohabiting	0.19	
Sister-brother	0.22		Married	0.18	
			Sibling's partnership		
Number of study siblings	1.02	0.59	Single	0.69	
Birth Order[a]			Cohabiting	0.16	
Older sibling	0.43		Married	0.15	
Younger sibling	0.42		Respondent parent	0.32	
Same age sibling (not twin)	0.04		Sibling parent	0.27	

[a]These variables along with twins add up to 100

For sibling relationship quality in adolescence, the average score for love was 4.02 on a 5-point scale (1-5) meaning that the sample often felt love for their sibling in adolescence. The average score for fights was 3.12 on a 5-point scale (1-5), and the average score for time together was 3.10 on a 4-point scale (1-4), reflecting that respondents sometimes fought with their sibling, and spent some time together with their sibling during adolescence.

Approximately 68% of the sample was made up of full-siblings, followed by 11% step-siblings, almost 11% half-siblings, and nearly 11% twins. Roughly 29% of the sample was comprised of sister-sister dyads, another 30% were brother-brother dyads, 19% were brother-sister dyads, and 22% were sister-brother dyads.

The average number of study siblings was 1.02. Older siblings made up about 43% of the sample, followed by 42% younger siblings, 11% twins, and 4% same age siblings who are not twins. The average age gap between siblings was 2.07 years.

Roughly 45% of siblings lived within one hour of each other, while 36% lived more than one hour apart, and 20% of siblings lived together.

Below are the results from the multivariate analyses that examined the association between sibling relationship quality in adolescence and reports of depressive symptoms and self-esteem in young adulthood. (I will provide a table in the discussion section that summarize the results).

Multivariate Results

Depression. The first aspect of mental health examined was depression (Table 4.2). Model 1 tested the association between sibling relationship quality in adolescence and reports of depression with control variables (the sibship characteristics and social demographic variables). All three aspects

Table 8. Ordinary-Least-Squared Regression Models Predicting Depression and Self-Esteem at Wave III (N = 1,753).

	Depression						Self-Esteem					
	Model 1			Model 2			Model 1			Model 2		
	b	SE		*b*	SE		*b*	SE		*b*	SE	
Sibling relationship at W II												
Love	0.02	0.01	*	0.03	0.01	*	0.04	0.01	**	0.05	0.02	**
Fights	-0.04	0.01	***	-0.05	0.01	***	0.04	0.01	**	0.04	0.02	**
Time together	-0.02	0.01	*	-0.04	0.02	*	0.03	0.02		0.04	0.03	
Sibling Type x Sibling relationship												
Half-sibling X Love				0.00	0.03					-0.08	0.04	*
Half-sibling X Fights				-0.03	0.02					0.05	0.02	**
Half-sibling X Time together				0.05	0.03	*				0.01	0.03	
Step-sibling X Love				-0.02	0.03					0.01	0.03	
Step-sibling X Fights				0.05	0.02	*				-0.06	0.03	*
Step-sibling X Time together				0.02	0.04					0.09	0.04	*
Controls												
Sibling Type												
Half-sibling	0.02	0.02		-0.03	0.20		0.05	0.03		0.16	0.21	
Step-sibling	0.06	0.02	**	-0.09	0.21		0.07	0.04	*	0.02	0.18	
Twins	-0.02	0.03		-0.31	0.10	**	0.11	0.07		0.44	0.14	**
Sibling Gender composition												
Brother-brother	-0.03	0.02		-0.04	0.02	*	0.02	0.04		0.02	0.04	
Brother-sister	-0.09	0.03	***	-0.10	0.03	***	0.11	0.04	**	0.09	0.04	*
Sister-sister	0.07	0.03	*	0.06	0.03		-0.04	0.04		-0.06	0.04	
Geographic Distance												
Within one hour	0.01	0.02		0.00	0.02		0.01	0.04		0.02	0.04	
More than one hour apart	0.01	0.01		0.01	0.02		0.03	0.02		-0.02	0.03	
Respondent's age	0.00	0.01		0.00	0.01		0.00	0.01		-0.01	0.02	
Respondent's Race/ethnicity												
Black	0.06	0.03	*	0.04	0.03		0.02	0.03		0.03	0.03	

Hispanic	0.06	0.03	*	0.05	0.04		0.03	0.04		0.04	0.05	
Other race	0.07	0.02	***	0.07	0.02	***	-0.02	0.03		0.01	0.03	
Statuses												
Respondent's education	0.02	0.01	*	0.02	0.01	*	0.02	0.01		0.02	0.01	
Sibling's education	-0.04	0.01	**	-0.04	0.01	***	0.02	0.01		0.01	0.01	
Respondent work status	0.00	0.01		-0.01	0.01		0.02	0.01		0.03	0.02	
Sibling work status	-0.02	0.01		-0.03	0.02	*	0.05	0.02	*	0.06	0.02	**
Respondent's partnership												
Cohabiting	-0.06	0.03	*	-0.08	0.03	*	0.08	0.04	*	0.09	0.04	*
Married	-0.02	0.03		-0.03	0.03		0.11	0.04	**	0.13	0.04	**
Sibling's partnership												
Sibling cohabiting	0.05	0.03		0.06	0.03	*	0.07	0.03	*	0.09	0.04	**
Sibling married	0.05	0.02	*	0.06	0.02	**	-0.04	0.03		-0.03	0.04	
Respondent parent	0.02	0.03		0.04	0.03		-0.01	0.03		0.00	0.03	
Sibling parent	-0.08	0.02	***	-0.08	0.02	***	0.05	0.04		0.05	0.04	
Number of study siblings	0.06	0.03		0.06	0.04		0.01	0.04		0.03	0.04	
Sibling age gap	0.01	0.01		0.01	0.01		-0.01	0.01		0.00	0.01	
Birth Order												
Younger sibling	0.04	0.03		0.04	0.03		0.00	0.04		-0.02	0.04	
Same age sibling (not twin)	-0.10	0.08		-0.11	0.08		-0.16	0.06	*	-0.15	0.07	*
Depression or self-esteem at W II	0.23	0.02	***	0.23	0.02	***	0.24	0.02	***	0.24	0.02	***
intercept	0.64	0.17	***	0.80	0.17	***	2.60	0.24	***	2.53	0.28	***
R squared	0.15	***		0.18	***		0.13	***		0.15	***	
N				1,753						1,753		

*p < .05; ** p <.01; *** p <.001

Omitted reference groups include: full-sibling, sister-sister, live together, respondent White, respondent single, sibling single, respondent non-parent, sibling non-parent., older sibling.

of sibling relationship quality in adolescence significantly influenced reports of depression in young adulthood. As expected, respondents who reported more time together with siblings (b =-0.02, p <.05) in adolescence had lower reports of depression in young adulthood. Unexpectedly, those who reported greater levels of love in adolescence (b =0.02, p <.05) reported *higher* levels of depression in young adulthood, for which I will discuss possible explanations later. Also unexpectedly, those who reported more fights (b =-0.04, p <.001) in adolescence had lower reports of depression in young adulthood. It could be that having more fights with siblings in adolescence may not indicate a poor sibling relationship.

Model 2 added interactions between sibling relationship quality in adolescence and sibling type. Two interaction terms appeared significant. The interaction between half-siblings and time spent together in adolescence was significant and the sign was positive (b = 0.05, p < .05). The interaction between step-siblings and fights in adolescence was also significant and the sign was positive (b = 0.05, p < .05). (As mentioned earlier, I do not interpret the results for twins.)

To interpret these significant interaction effects, I calculated the predicted associations between fights with siblings in adolescence and mental health in young adults for full-siblings, half-siblings, and step-siblings using coefficients from Model 2 and the means for variables in the model. As shown in Figure 4.1, the depression levels are lower as the frequency of fights in adolescence increase for full-siblings and half-siblings. For step-siblings, however, the depression levels in young adulthood change little across different frequencies of fights with siblings in adolescence. In short, the frequency of fights with siblings in adolescence was related to lower reports of depression in young adulthood for full-siblings and half-siblings, but not step-siblings. Figure 4.2 shows the predicted associations between time together with siblings and

Figure 1. Predicted Means for Depression by Fights at W II and Sibling Type

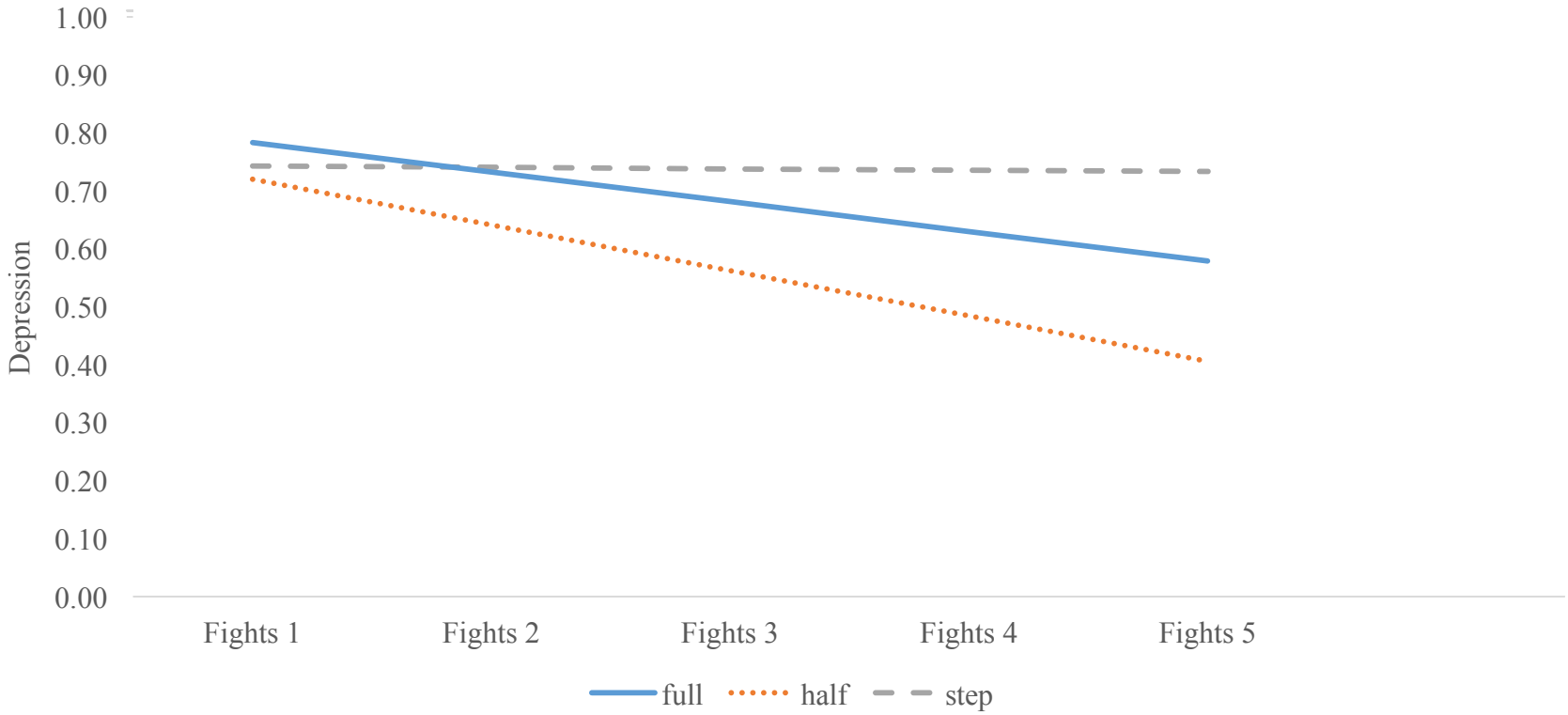
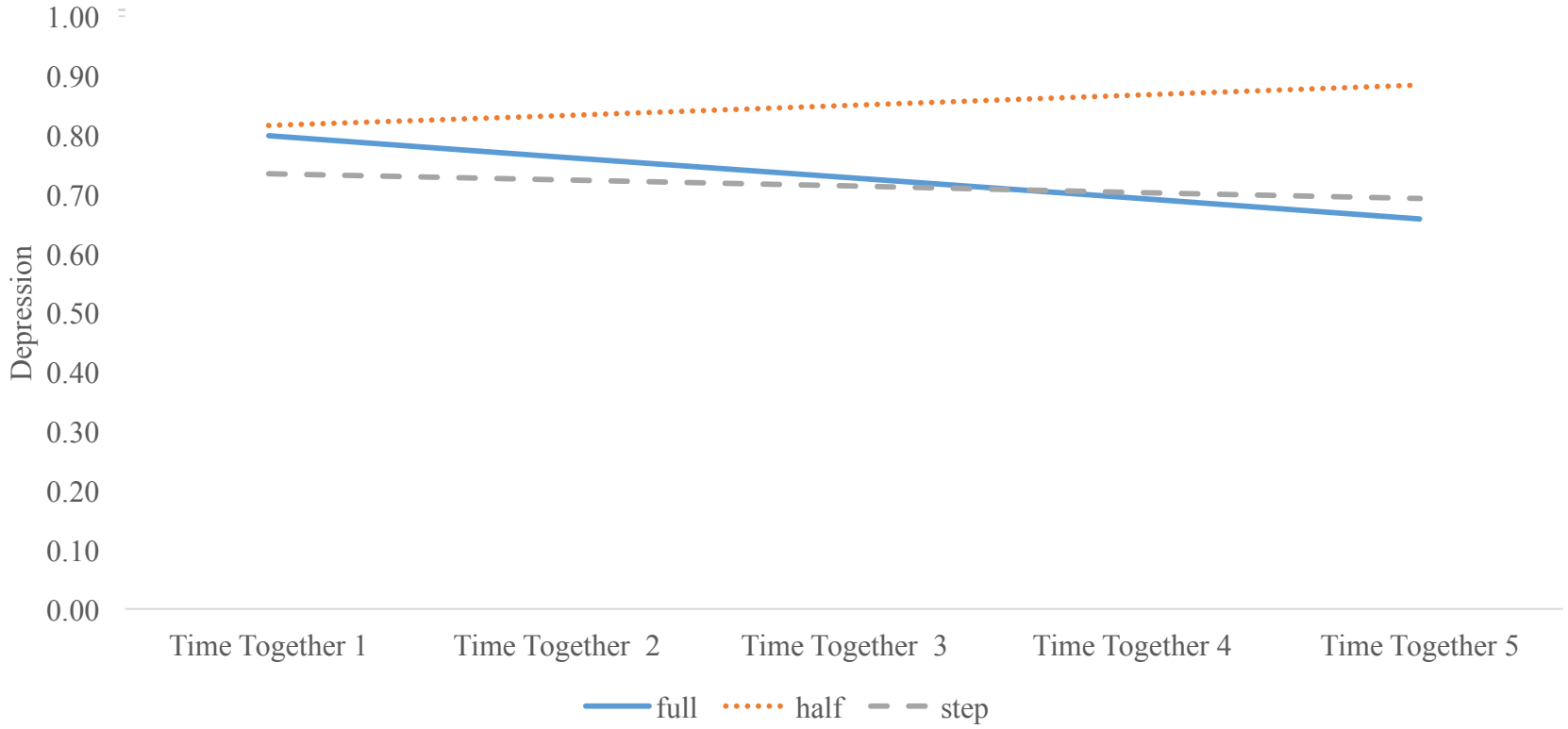


Figure 2. Predicted Means for Depression by Time Spent Together at W II and Sibling Type



depression in young adulthood. The predicted means in Figure 2 illustrates that among full-siblings and step-siblings, as reports of time together with one's sibling in adolescence increase, reports of depression in young adulthood are lower. The slope is slightly steeper for full-siblings than for step-siblings, but the interaction between step-siblings and time together was not significant, thus, the difference was not significant. However, for half-siblings, as reports of time together with one's sibling in adolescence increase, reports of depression in young adulthood are slightly higher.

All in all, the findings suggest that sibling relationship quality in adolescence is related to reports of depression in young adulthood, although the directions of associations were not always the same as predicted; and whether the associations varied by sibling type depended on the aspects of sibling relationship quality. Frequency of fights with siblings was related to lower reports of depression for full-siblings and half-siblings, but not for step-siblings. Frequency of time spent together with siblings was associated with lower reports of depression for full-siblings and step-siblings, but not for half-siblings. Finally, emotional closeness with siblings ("love") in adolescence was associated with higher reports of depression in young adulthood for full-siblings, half-siblings, and step-siblings.

Among control variables, being a twin ($b = -0.31$, $p < .01$), being a part of a brother-brother ($b = -0.04$, $p < .05$) or brother-sister ($b = -0.10$, $p < .001$) dyad, sibling's education ($b = -0.04$, $p < .01$), sibling's work status ($b = -0.03$, $p < .05$), respondent's cohabiting status ($b = -0.08$, $p < .05$), and sibling's parental status ($b = -0.08$. $p < .01$) significantly influenced lower reports of depression. While identifying as an "other" race ($b = 0.07$, $p < .01$), respondent's education ($b = 0.02$, $p < .05$), sibling's cohabiting status ($b = 0.06$, $p < .05$), sibling's marital status ($b = 0.06$, p

<.01), and a reports of depression in adolescence (b = 0.23, p <.001) significantly influenced higher reports of depression.

In supplemental analysis (not shown), I examined whether the effects of sibling relationship quality in adolescence on young adults' depressive symptoms remain significant after controlling for *current* sibling relationship quality. I added the three measures of relationship quality in young adulthood that were examined for the total sample regardless of co-residence—i.e., emotional closeness, fights, and help seeking— (see Chapter III) to Model 1. I added the three measures of relationship quality in young adulthood and the interaction between these measures and sibling type to Model 2. Results for the three measures of sibling relationship quality in adolescence and their interaction effects with sibling type did not change much from those without adding sibling relationship quality in young adulthood to the models.

Self-esteem. The second aspect of mental health examined is self-esteem (Table 4.2). Model 1 tested the association between sibling relationship quality in adolescence and reports of self-esteem in young adulthood, and included control variables (e.g., the sibship characteristics and social demographic variables). Reports of love for one's sibling (b = 0.04, p <.01) and reports of fights with one's sibling (b = 0.04, p <.01) in adolescence significantly influenced higher reports of self-esteem in young adulthood. As in the case of depression, fights with siblings may not reflect poor relationships. Time spent together with siblings in adolescence was not related to self-esteem in young adulthood.

Model 2 added interactions between sibling relationship quality in adolescence and sibling type to examine whether the association between sibling relationship quality in adolescence and self-esteem in young adulthood vary across sibling types. Four interaction terms were significant. The interactions between half-siblings and love for one's sibling, and step-

siblings and fights in adolescence were significant and the signs were negative. The interactions between half-siblings and fights, and step-siblings and time spent together were significant and the signs were positive.

To interpret these interactions, I calculated the predicted association between reports of love for one's sibling in adolescence and self-esteem in young adulthood (Figure 4.3). The predicted means in Figure 4.3 show that for full-sibling and step-siblings, as reports of love for one's sibling in adolescence increase, reports of self-esteem in young adulthood are higher. However, for half-siblings, the association was in the opposite direction: as reports of love for one's sibling in adolescence increase, reports of self-esteem in young adulthood are slightly lower. For fights, the predicted means in Figure 4.4 illustrate that for full-siblings and half-siblings, as reports of fights with one's sibling in adolescence increase, reports of self-esteem in young adulthood are higher. The slope is slightly steeper for half-siblings than for full-siblings, suggesting that the positive association between fights and self-esteem was greater for half-siblings than full-siblings, as the positive interaction for half-siblings and fights indicated. However, among step-siblings, as reports of fights in adolescence increase, reports of self-esteem in young adulthood are slightly lower. Finally, for time spent with one's sibling, Figure 4.5 illustrates that as reports of time together with one's sibling in adolescence increase, reports of self-esteem in young adulthood are much higher for step-siblings than for full-siblings or half-siblings.

In sum, love for one's sibling in adolescence was related to higher self-esteem in young adulthood for full-siblings and step-siblings, but not for half-siblings. Fights with siblings in adolescence was related to higher self-esteem for full-siblings and half-siblings, with a greater

Figure 3. Predicted Means for Self-Esteem by Love at W II and Sibling Type

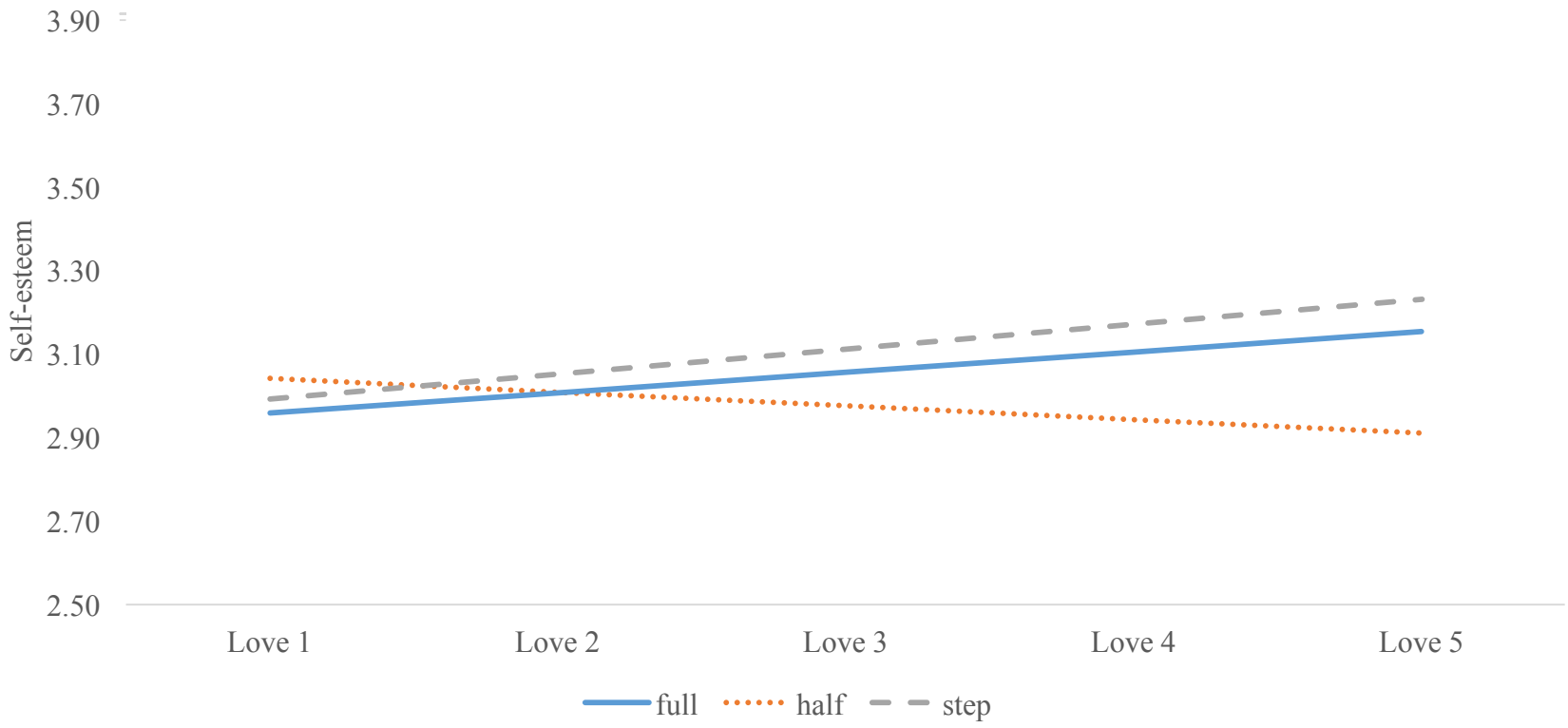


Figure 4. Predicted Means for Self-Esteem by Fights at W II and Sibling Type

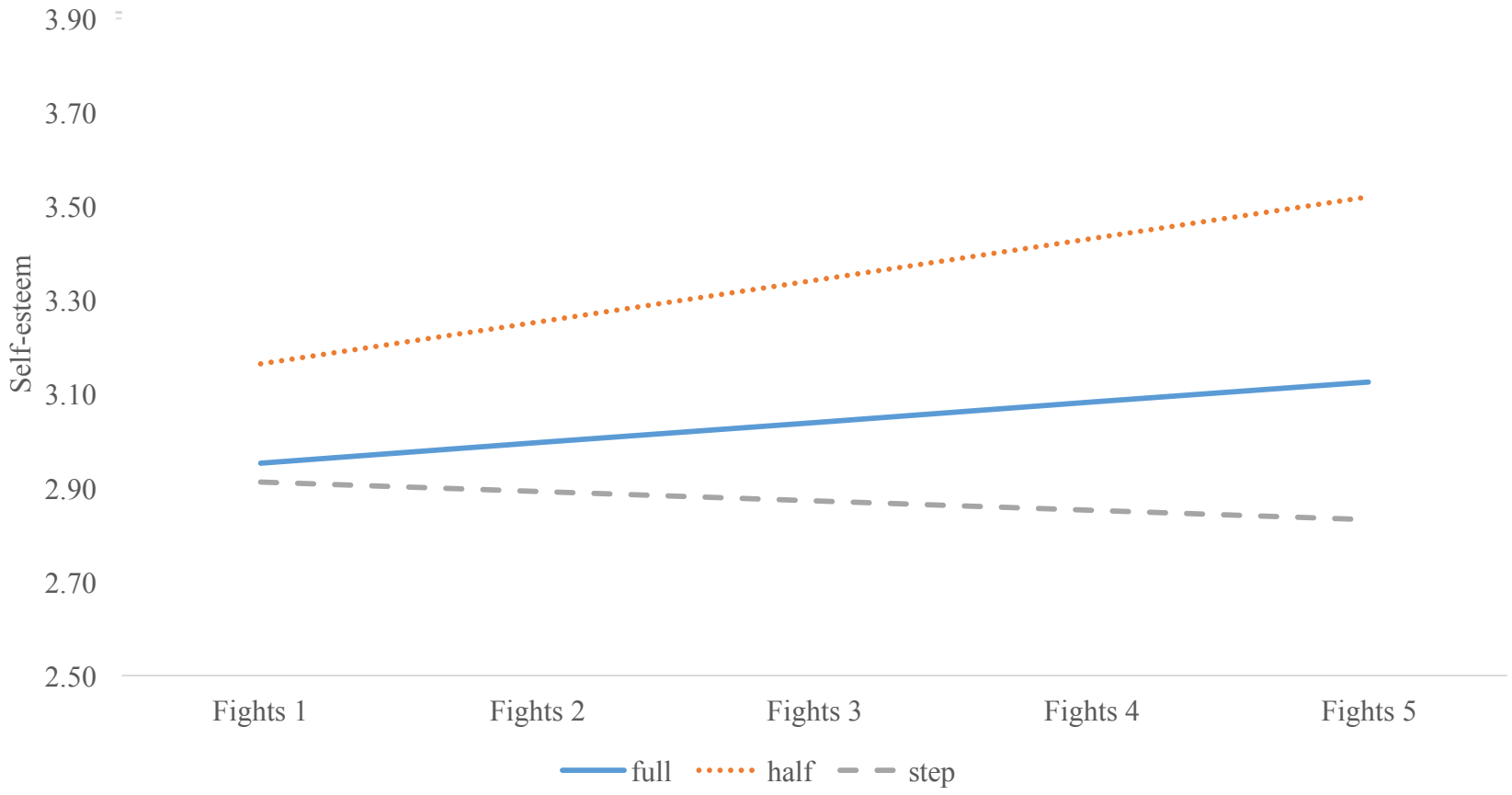
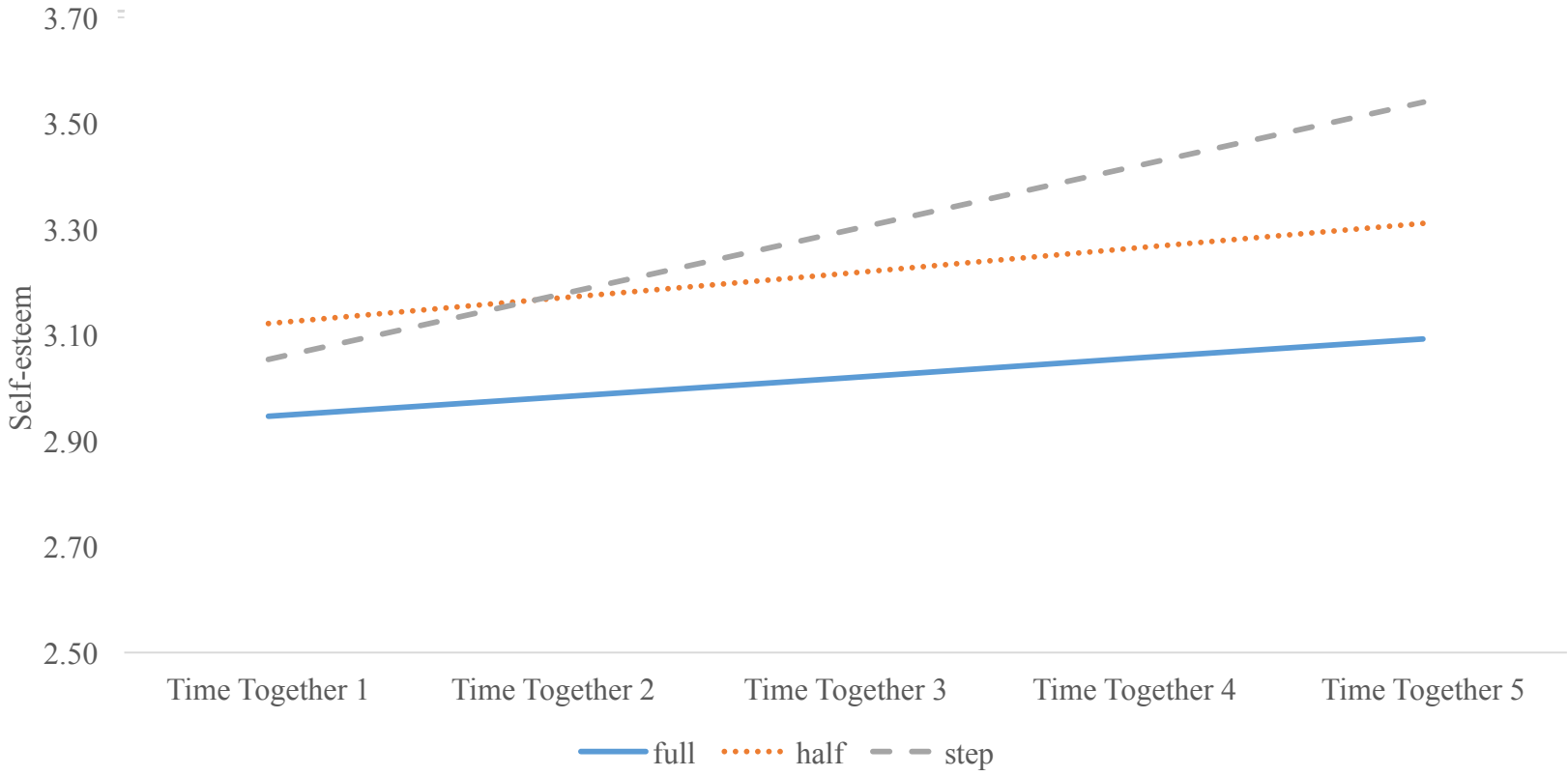


Figure 5. Predicted Means for Self-Esteem by Time Spent Together at WII and Sibling Type



association for half-siblings, but not for step-siblings. Time together was related to higher self-esteem more so for step-siblings than full-siblings or half-siblings.

Among control variables being twins (b = 0.44, p <.01), being part of a brother-sister (b = 0.09, p <.05) dyad, sibling's work status (b = 0.06, p <.01), respondent's cohabitation status (b = 0.09, p <.05), respondent's marital status (b = 0.13, p <.01), sibling's cohabiting status (b = 0.09, p<.01) and reports of self-esteem in adolescence (b = 0.24, p <.001) all significantly influenced higher reports of self-esteem in young adulthood. While having a same age sibling who is not a twin (b = -0.15, p <.05) significantly influenced lower reports of self-esteem in young adulthood.

As I did for depression, I conducted supplemental analysis (not shown) where I examined whether *current* sibling relationship quality in young adulthood would matter more than sibling relationship quality in adolescence for young adults' self-esteem. I added three measures of relationship quality in young adulthood – i.e., emotional closeness, fights, and help seeking – (see Chapter III) to Model 1. I added the three measures of relationship quality in young adulthood and the interaction between these measures and sibling type to Model 2. Results did not change much.

A summary of findings is presented in Table 4.3 below

Discussion

This chapter analyzed the influence of sibling relationship quality in adolescence on reports of depressive symptoms and self-esteem in young adulthood, roughly 18-26, with a specific attention to variation by sibling type. I had two hypotheses. The life course perspective (Elder, 1994) and attachment theory (Ainsworth, 1989), led me to predict that individuals who report better relationship quality in adolescence (greater reports of love, fewer fights, and

Table 9. Summary of Results

	Mental Health in Young Adulthood					
	Depression			Self-Esteem		
	Full-siblings	Half-siblings	Step-siblings	Full-siblings	Half-siblings	Step-siblings
Sibling Relationship in Adolescence						
Love	+	+	+	+	-	+
Fight	-	-		+	++	-
Time Together	-	+	-	+	+	++

"+" indicates a position association
"++" indicates a greater positive association than full-siblings
"-" indicates a negative association

spending more time together), would report lower depressive systems and higher self-esteem, than those with less favorable relationships with their siblings in adolescence (Hypothesis 1).

Hypothesis 1 received weak support with regard to depression in that reports of love for one's sibling, fights with one's sibling, and time spent together with one's sibling in adolescence all significantly influenced reports of depression in young adulthood. The directions of the associations of reports of love and fights with depression were the opposite from what I hypothesized. Specifically, counter to Hypothesis 1, greater reports of love for one's sibling in adolescence actually led to reports of *higher* reports of depression, not lower reports of depression, in young adulthood, and reporting more fights with one's sibling in adolescence led to *lower* rather than higher reports of depression in young adulthood. One study found that among girls, reports of high levels of warmth for siblings in adolescence were associated with steep declines in depressive symptoms in adolescence followed by a modest increase in young adulthood (Finan et al., 2018). While the present study did not examine the influence of sibling relationship quality in adolescence on depressive symptoms in adolescence or specifically focus on gender differences, similar results do suggest that greater reports of love for one's sibling in adolescence are positively associated with depressive symptoms in young adulthood. Perhaps having great warmth or love for one's sibling in adolescence leads to a feeling of loss in young adulthood that is reflected in greater depressive symptoms. For sibling fights, Finan and colleagues (2018) found that reports of high levels of hostility for siblings in adolescence were associated with steep declines in depressive symptoms in adolescence, followed by modest increases in depressive symptoms in young adulthood. While Hypothesis 1 predicted a similar relationship, my findings suggest that more fights in adolescence are actually associated with lower reports of depression in young adulthood. As mentioned before, fights may not be

indicative of poor sibling relationship quality, but rather greater interaction and involvement with one's sibling growing up. As hypothesized, more time spent together with one's sibling in adolescence was associated with lower reports of depression in young adulthood.

Hypothesis 1 also received partial support with regard to self-esteem. As hypothesized, greater reports of love for one's sibling in adolescence was associated with higher reports of self-esteem. Similar to the depression and counter to my hypothesis, reports of fights with one's sibling in adolescence actually influenced higher reports of self-esteem, rather than lower reports self-esteem in young adulthood. Time together with one's sibling in adolescence did not significantly influence reports of self-esteem in young adulthood. Similar to Guan and Fuglini (2015) who measured relationship quality with sibling support, the present study found that love for one's sibling in adolescence was associated with higher reports of self-esteem in young adulthood. While the measures were not the same, the sentiment that positive features of sibling relationship quality in adolescence are generally associated with higher reports of self-esteem in young adulthood is shared by both studies.

The second main goal of this chapter was to examine whether the association between sibling relationship quality in adolescence and mental health in young adulthood might differ by sibling type. On the basis of the stepfamilies as an incomplete institution (Cherlin, 1978), I stated two contrasting predictions. First, I hypothesized that the association between sibling relationship quality in adolescence and reports of depression and self-esteem in young adulthood would be stronger for full-siblings than for half-siblings and step-siblings (Hypothesis 2a). Second, I hypothesized that the association between sibling relationship quality in adolescence and reports of depression and self-esteem in young adulthood would be stronger for half-siblings and step-siblings than for full-siblings (Hypothesis 2b). My findings suggest that overall, there is

some variation in the relationship between sibling relationship quality in adolescence and reports of depression and self-esteem in young adulthood by sibling type. However, the patterns differ for half-siblings and step-siblings, suggesting that half-siblings and step-siblings may have different dynamics in their sibling relationships in adolescence that future research needs to conceptualize differently. In interpreting whether the findings supported Hypotheses 2a or 2b, because my findings show the opposite directions of associations for love and fights from what I predicted, as discussed above, I focus mostly on differences by sibling type in the associations—whether the significant association exists—and if so, whether the degree of associations differ across the three sibling types.

For depression, there is no variation in the association between love for one's sibling in adolescence and depression by sibling type: Higher scores in love for one's sibling in adolescence is positively related to depressive symptoms similarly for full-, half-, and step-siblings. The association between reports of fights with one's sibling in adolescence and reports of depression in young adulthood is found for full-siblings and half-siblings, but not for step-siblings. These results support Hypothesis 2a for the comparison between step-siblings and full-siblings, but do not support either Hypothesis 2a or 2b for half-siblings and full-siblings: half-siblings did not significantly differ from full-siblings in the negative association between frequency of fights and depression in young adulthood. It is possible that meaning of sibling fights may differ for step-siblings compared to full-siblings and half-siblings. The negative association between time spent together with one's sibling in adolescence and reports of depression in young adulthood is found for full-siblings and step-siblings, but not for half-siblings. These results support Hypothesis 2a for half-siblings compared with full-siblings, because I did not find the association for half-siblings and time spent together in adolescence but

did find the association for full-siblings. The results support neither Hypotheses 2a or 2b for step-siblings, for whom time spent together in adolescence is negatively related to depression in young adulthood similarly as it is for full-siblings. All in all, for depression, the results support Hypothesis 2a more than Hypothesis 2b.

For self-esteem, the positive association between love for one's sibling in adolescence and reports of self-esteem in young adulthood is found for full-siblings and step-siblings, whereas the association is negative for half-siblings. Neither Hypotheses 2a nor 2b are supported for step-siblings compared with full-siblings, because both types of siblings show positive associations between love and self-esteem. The direction of the association is the opposite for half-siblings from the direction found for full-siblings, which does not support Hypothesis 2a or Hypothesis 2b. The positive association between fights in adolescence and reports of self-esteem in young adulthood is stronger for half-siblings than for full-siblings, supporting Hypothesis 2b for half-siblings, but not for step-siblings. The positive association between time spent together in adolescence and self-esteem in young adulthood is found for all types with greater effects for step-siblings than full-siblings or half-siblings, supporting Hypothesis 2b for step-siblings. Frequency of time spent together with siblings in adolescence appears to make the most difference in self-esteem and mental health for young adults with step-siblings. Perhaps it takes time and negotiation for stepfamilies to establish their own rules and expectations, and therefore spending more time together may be especially important for step-siblings to form close ties.

The present analyses are not without limitations. Although the present sample was drawn from a large-scale, longitudinal, national data set, and included both the respondents' and their siblings' life course statuses and other characteristics, the sample was not representative of young adults and siblings in the U.S. general population. The sample is also dated (2001-2002)

and therefore may not accurately capture the current state of mental health among young adults with siblings. Unfortunately, the slightly less dated Wave IV (2008) data that was collected when respondents were 24-32 did not include the self-esteem measures that were included in the analyses. The data also did not allow us to know if individuals with step-siblings or half-siblings also had full-siblings, or vice versa. Additionally, there were a significant number of mismatches between Wave II and III in the focal siblings with whom the respondent answered questions about their relationship quality. Although we had information about sibling relationship quality in adolescence and in young adulthood, we were not able to break down the results by comparing how sibling relationship quality changed from adolescence to young adulthood among this sample of siblings who lived together during adolescence. These analyses were limited to residential siblings from adolescence and did not include siblings who grew up outside the household during the respondent's adolescent years. Future research should use more recent samples of siblings to further investigate the influence of sibling type and sibling relationship quality on mental health in young adulthood. Finally, it is possible that mental health might influence sibling relationship quality, although existing research tends to examine how sibling relationships influence mental health (e.g., Buist et al., 2013; Finan et al., 2018). Future research should examine the possible reciprocal associations between sibling relationship quality and mental health. Future research may also benefit from paying attention to twins, although twins were not the focus of these analyses, there were differences between twins and other sibling types,

To conclude, the current analyses contribute to existing bodies of family, sibling, and mental health research by including sibling type in the association between sibling relationship quality and depression and self-esteem in young adulthood, while using a unique, longitudinal

sample of matched siblings. The findings suggest that close residential sibling relationships in adolescence generally help enhance young adults' self-concept and mental health with some differences by sibling type. My findings that relationship quality with half-siblings who lived together during adolescence and step-siblings who lived together during adolescence has different effects on young adults' depression and self-esteem suggests that research should investigate half-siblings separately from step-siblings to better understand sibling relationships. Further research is needed to better understanding mechanisms for differences in the effects of sibling relationship quality in adolescence on self-concept and mental health in young adulthood.

CHAPTER V. CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

A substantial proportion of American children and youths today have half-siblings or step-siblings (Kreider & Ellis, 2011). Much research has examined stepparent-stepchild relationships (e.g., King, Amato, & Lindstrom, 2015; King et al., 2014) or the effects of having half-siblings or step-siblings on adolescent well-being (e.g., Halpern-Meekin & Tach, 2008; Hofferth, 2006). Yet, relatively little research has examined how relationship quality of these siblings differ from that of full-siblings in adolescence and young adulthood. This dissertation contributes to research in this area by examining three main sets of questions using data from Add Health: (1) Does residential sibling relationship quality in adolescence vary by respondent's type of siblings? Does it vary even after controlling for variation in family characteristics by residential sibling types? (2) Does sibling relationship quality in young adulthood vary by sibling type? Does it vary even after controlling for residential sibling relationship quality during adolescence? (3) Does the association between residential sibling relationship quality in adolescence and mental health and self-concept in young adulthood differ across the three sibling types? Of various aspects of sibling relationship quality, I examined emotional closeness (feelings of love), time spent together, and frequency of fights in adolescence and visits, phone calls and emails, help-seeking, fights, and emotional closeness in young adulthood. This dissertation contributes to multiple research areas, including research on step- and blended families, sibling relationships across the life course, and young adults' mental health and self-concept.

Key Findings

Sibling Relationship Quality in Adolescence: The Effects of Sibling Type and Family Characteristics

Chapter II examined variation in sibling relationship quality by sibling type in adolescence. Drawing on the stepfamilies as an incomplete institution perspective and family systems theory I predicted that respondents with only residential full-siblings would report the best sibling relationship quality (greater feelings of love, more time together, and fewer fights), followed by respondents with residential half-siblings (but not step-siblings), and then finally respondents with residential step-siblings would report the worst relationship quality (Hypothesis 1). Results show partial support. Further, I predicted that after controlling for family characteristics such as residential parent type, parent-child relationship quality, and family belonging, differences in sibling relationship quality across sibling types would be reduced or disappear (Hypothesis 2). The second hypothesis also received partial support, contingent on respondents' sibling type and the measure of sibling relationship quality.

Overall, my results reflect that there is variation in sibling relationship quality based on residential sibling type and the aspect of sibling relationship quality being analyzed. Compared to respondents with only full-siblings, respondents with half-siblings reported significantly less love for their siblings and time together with their sibling, before family characteristics were controlled for. Once family characteristics were included, differences in love disappeared and differences in time together were significantly reduced. Respondents with residential half-siblings did not differ from respondents with only residential full-siblings in reports of fights. Both respondents with only full-siblings and respondents with half-siblings had significantly greater reports of love for their siblings, but also significantly more fights with their sibling, compared to respondents with step-siblings, regardless of whether family characteristics were controlled. Respondents with only full-siblings did not significantly differ from respondents with step-siblings in reports of time together. Respondents with half-siblings reported spending

significantly *less* time with their siblings compared to respondents with step-siblings, but the difference disappeared when family characteristics were controlled for.

Hypothesis 1 and Hypothesis 2 received partial support with regard to love and time together, but not fights. Additionally, in some ways time together and fights operated counter to my expectations: respondents with only residential full-siblings and respondents with residential step-siblings have no differences in reports of time together, and respondents with residential half-siblings reported significantly *less* time together compared to respondents with step-siblings, before family characteristics were controlled for. This may be because respondents with step-siblings had a much larger proportion of respondents living with their biological father and stepmother, biological father only, or in "other" types of households, meaning that over 40 percent of groups that included step-siblings were not living with their biological mothers. Not living with a residential mother significantly influenced reports of time together and not living with a biological mother may mean that the respondents with step-siblings in this sample may not have much visitation or contact with their mother at all, and therefore are living with their step-siblings full-time. It is important to remember that this is a select sample limited to adolescents and their residential adolescent siblings, and that there is an overrepresentation of individuals not living with residential mothers. One explanation for the finding that, in contrary to the prediction, respondents with step-siblings fight *less* rather than more than respondents with only full-siblings or respondents with half-siblings may be that fights between siblings might actually be indicative positive or close relationships rather than negative or distant relationships. Prior research has found that siblings who fights more often in adolescence report feeling emotionally close with their siblings in young adulthood, suggesting that fights may actually have long term benefits to sibling relationship development (Lindell et al., 2014).

Although Hypothesis 2 received limited support, it is worth discussing that a greater sense of family belonging did significantly influence greater reports of love, greater reports of time spent together, and fewer fights across all residential sibling groups. Past research has found that family belonging is a key factor that aids us in understanding relationship quality among family members (King et al., 2018; King, Boyd, & Thorsen, 2015). As discussed, not living with a residential mother influenced greater reports of time together, while high mother-child relationship quality influenced greater reports of love and time together, high father-child relationship quality influenced greater reports of love, and low father-child relationship quality discouraged reports of love. The finding with regard to love is in line with past research that found that mother-child relationship quality influenced relationship quality with other family members (Jensen & Shafer, 2013; King, Amato, & Lindstrom, 2015).

Sibling Relationship Quality in Young Adulthood: The Effects of Sibling Type and Adolescent Relationship Quality

Chapter III examined variation in sibling relationship quality in young adulthood by sibling type. Drawing on the stepfamilies as incomplete institution perspective, I predicted that full-siblings would report better sibling relationship quality (more visits, more calls and emails, more closeness, more seeking aid/advice, and fewer fights), than half-siblings and step-siblings, while half-siblings would report better sibling relationship quality compared to step-siblings, but not full-siblings (Hypothesis 1). As expected, during young adulthood, step-siblings reported fewer visits, fewer calls and emails, less emotional closeness, and less help and advice seeking compared to both full-siblings and half-siblings. Counter to my hypotheses, both full-siblings and half-siblings actually reported more fights than step-siblings. However, as discussed above, it seems that fights may be indicative of closer rather than more distant relationships between

siblings and that siblings who choose to limit interaction with one another may not have much opportunity to fight. Including reports of sibling relationship quality in adolescence did not influence differences in relationship quality in young adulthood between full-siblings and step-siblings or half-siblings and step-siblings to significantly reduce or disappear. Full-siblings reporting more visits (White & Riedmann, 1992) and more emotional closeness (Vogt Yuan, 2009) than step-siblings is consistent with past research. Together, other family characteristics equal, the only difference between full-siblings who lived together during adolescence and half-siblings that lived together during adolescence was that full-siblings reported more visits than half-siblings. It seems that with the same family characteristics, relationships between half-siblings who lived together during adolescence are more similar to that of full-siblings who lived together during adolescence, rather than step-siblings who lived together during adolescence. This is an important point for future research to consider, as half-siblings and step-siblings have often timed been grouped together in sibling analyses.

It seems that if blended or stepfamilies could establish close, cohesive relationships within family members, half-sibling or step-sibling relationships might be able to be as close as full-siblings are. Thus, I predicted that after controlling for sibling relationship quality in adolescence, differences in sibling relationship quality in young adulthood would be reduced or disappear (Hypothesis 2). The results did not support this prediction, except with regard to half-siblings and help seeking. Yet, it is worth noting that the idea of continuity in sibling relationship quality from adolescence to young adulthood was reflected in the analyses. Respondents who reported more love for their sibling and respondents who spent more time together with their sibling in adolescence had more visits, more calls and emails, more emotional closeness, asked for more help and advice, and fought more with their siblings in young adulthood. Additionally,

reports of fights with one's siblings in adolescence was associated with more emotional closeness and fewer fights in young adulthood.

In conclusion, sibling relationships are unique, complex, long lasting, and often times quite important. Chapter III analyzed various aspects of sibling relationship quality – visits, calls and emails, emotional closeness, seeking help and advice, and fights – during young adulthood, a time in the life course when siblings often times begin living apart and sibling relationships are more likely to become relationships of choice. The results show that other family characteristics equal, step-siblings who lived together during adolescence differ from both full-siblings who lived together during adolescence and half-siblings who lived together during adolescence in all five aspects of relationship quality, with step-siblings reporting fewer visits, fewer calls and emails, less emotional closeness, less help and advice seeking, and fewer fights. However, apart from half-siblings who lived together during adolescence reporting fewer visits than full-siblings who lived together during adolescence, with the same family characteristics, half-siblings do not differ from full-siblings in reports of relationship quality.

Sibling Relationship Quality, Mental Health, and Self-Concept: The Effects of Sibling Type

Chapter IV investigated whether the association between sibling relationship quality in adolescence and mental health in young adulthood differs by sibling type. Overall, the findings suggest that close sibling relationships in adolescence are generally beneficial for young adults' self-concept and mental health, although there is some variation by sibling type. Based on the life course perspective (Elder, 1994) and attachment theory (Ainsworth, 1989), I expected that individuals who report better relationship quality in adolescence (greater reports of love, fewer fights, and spending more time together), would report lower depressive symptoms and better self-esteem, than those with less favorable relationships with their siblings in adolescence

(Hypothesis 1). This first hypothesis was partially supported. With regard to variation by sibling type, the stepfamilies as incomplete institution perspective (Cherlin, 1978) led me to two competing hypotheses. First, I predicted that the association between sibling relationship quality in adolescence and reports of depression and self-esteem in young adulthood would be stronger for full-siblings than for half-siblings and step-siblings (Hypothesis 2a). Second, I expected that the association between sibling relationship quality in adolescence and reports of depression and self-esteem in young adulthood would be stronger for half-siblings and step-siblings than for full-siblings (Hypothesis 2b). Both Hypothesis 2a and 2b received limited support.

Reports of love in adolescence influenced higher reports of depression in young adulthood, while reports of fights and time together in adolescence were related to lower reports of depression in young adulthood. Although reports of love and fights significantly influenced reports of depression, both operated in the opposite direction of what I predicted. However, past research has found that among girls, high levels of warmth for siblings in adolescence was associated with a modest increase in depressive symptoms in young adulthood (Finan et al., 2018). The association between feelings of love for one's sibling in adolescence and higher reports of depression in young adulthood may be explained by feelings of loss or feeling less of a strong daily attachment to one's siblings. Although siblings can offer one another love and support in both adolescence and in young adulthood, they may simply have more opportunities to positively influence one another's well-being in adolescence compared to young adulthood. Additionally, findings from the previous chapter and past research seem to suggest, fights may reflect closer rather than distant relationships, or poor relationship quality. Both sibling research and couples research seem to suggest that it is healthier for siblings or couples to fight and work

through negative emotions, rather than to stonewall each other and not talk about issues (e.g., Gottman, 2008; Lindell et al., 2014).

Reports of love for one's sibling and fights in adolescence were both associated increased reports of self-esteem in young adulthood. The positive association between love and self-esteem aligns with past research that has found that positive features of sibling relationship quality in adolescence are associated with greater reports of self-esteem in young adulthood (Guan & Fuglini, 2015). As with depression and counter to my hypothesis, the positive association between fights with one's sibling in adolescence and self-esteem bolsters the argument that fights between siblings may generally be a positive rather than negative aspect of sibling relationship quality.

My findings reflect that there is some variation in the relationship between residential sibling relationship quality in adolescence and reports of depression and self-esteem in young adulthood by sibling type. Interestingly, even with the same family characteristics, the patterns differ for half-siblings who lived together during adolescence and step-siblings who lived together during adolescence, which suggests that residential half-siblings and residential step-siblings may have different dynamics in their sibling relationships in adolescence that were not included in these analyses. Due to aspects of relationship quality operating counter to my hypotheses, in interpreting my findings that include interactions by sibling type, I focused mostly on differences by sibling type in the associations—whether the significant association exists—and if so, whether the degree of associations differ across the three sibling types.

For depression, higher scores in love for one's sibling in adolescence is related to higher reports depressive symptoms similarly for full-siblings, half-siblings, and step-siblings in young adulthood, and there is no variation in this association by sibling type. Perhaps loving

relationships between residential siblings in adolescence leads to a sense of sadness or loss across all sibling types, because of the feeling of nostalgia and loss shared by many with regard to missing the closeness of special childhood relationships. The association between reports of fights with one's sibling in adolescence and lower reports of depression in young adulthood is found for full-siblings and half-siblings, but not for step-siblings. Along with findings from the past two chapters, this finding seems to suggests that fights may not operate in the same manner or have the same meaning for step-siblings who lived together during adolescence, as they do for full-siblings and half-siblings who lived together during adolescence. The negative association between time spent together with one's sibling in adolescence and reports of depression in young adulthood is found for full-siblings and step-siblings, but not for half-siblings. Perhaps spending time together with residential siblings during adolescence with a sibling who shares only one biological parent is not as enjoyable or beneficial as spending time with a sibling who shares both biological parents or no biological parents. This may speak to feelings of jealousy or stress from parental favoritism that might occur in blended families, where couples have at least one child from a precious relationship and at least one shared child together. Overall, for depression, the results support Hypothesis 2a more than Hypothesis 2b, as these associations were generally stronger for full-siblings than for half-siblings or step-siblings.

For self-esteem, the association between love for one's sibling in adolescence and higher reports of self-esteem in young adulthood is found for full-siblings and step-siblings, while love for one's sibling is associated with lower reports of self-esteem for half-siblings. The association between fights in adolescence and reports of higher self-esteem in young adulthood is stronger for half-siblings than for full-siblings. The association between time spent together in adolescence and higher reports of self-esteem in young adulthood is strongest for step-siblings,

compared to full-siblings or half-siblings, supporting Hypothesis 2b. Although time together in adolescence alone did not significantly influence reports of self-esteem, frequency of time spent together with siblings in adolescence appears to make the most difference in self-esteem and mental health for young adults with step-siblings. This result supports that it takes time and negotiation for stepfamilies to establish their own rules and expectations. Spending more time together may especially important for step-siblings to form close ties.

Limitations and Future Research

These present analyses are not without limitations. In Chapter II, I was unable to examine sibling dyads, because I was unable to directly match siblings from the household roster with reports of sibling relationship quality. Additionally, the sample was limited to siblings living in the household aged 12-20, therefore siblings younger than 11 years old, those aged 21 and older, and nonresidential siblings were not included in the sample. Similarly, the analyses were limited to residential parents, therefore the influence of non-resident parent-child relationship quality was not included in the analyses. Further, the data are dated, as Wave II of Add Health was collected in 1996. Future research would benefit from using more recent samples that include full-, half-, and step- siblings of a wider age range and those who are not living in the same households. Although the data did not allow me to capture how long siblings had lived together as a family, future research would benefit from incorporating duration of time together as a family into analyses. Additionally, future research should aim to incorporate other aspects of sibling relationship quality in addition to feeling of love, time together, and fights, using multiple questions to measure each aspect rather than single-item measures, if possible. Further, incorporating both sibling type and family structure in analyses would provide future researchers more clarity in understanding sibling dynamics across different sibling types and

family structures, particularly with regard to half-siblings. It is important to investigate factors that are different between half-siblings and step-siblings that this dissertation was unable to measure. For example, half-siblings may be more likely than step-siblings to live with one another for longer years, which may make half-sibling relationships closer than step-sibling relationships. It is also possible that half-siblings are more likely than step-siblings to live with one another when at least one of them was a young child—it could be that the timing of co-residence in their developmental stage matters in the formation of sibling relationships. Finally, due to the potential influence of both biological ties with immediate and extended family members and the timing of residency with siblings, half-siblings may have more opportunities to enjoy traditions, special occasions, and celebrations together compared to step-siblings and therefore may be more likely to form close and secure relationships.

Although the sample used in Chapters III and IV were drawn from a large-scale, longitudinal, national data set, and included both the respondents' and their siblings' life course statuses and other characteristics, the sample was not representative of young adults and siblings in the U.S. general population. The sample was limited to those who lived with their adolescent siblings during their own adolescent years, therefore nonresidential siblings and siblings outside of the age range were not included in the analyses. The sample is also dated (2001-2002), and therefore may not accurately capture the nature of contact between siblings or the current state of mental health among young adults with siblings. Unfortunately, the slightly less dated Wave IV (2008) data that was collected when respondents were 24-32, did not include the sibling relationship quality measures or the self-esteem measures that were included in the analyses. In Chapter III and Chapter IV, the matched sibling pairs data also not allow us to know if individuals with step-siblings or half-siblings also had full-siblings, or vice versa. Additionally,

there were a significant number of mismatches between Wave II and III in the focal siblings with whom the respondent answered questions about their relationship quality. Although we had information about residential sibling relationship quality in adolescence and in young adulthood, we were unable to break down the results by comparing how sibling relationship quality changed from adolescence to young adulthood. Future research should consider actual changes in relationship quality from adolescence to young adulthood, by sibling type. Existing research generally shows that sibling relationships improve with regard to emotional closeness from adolescence to young adulthood, however it is unclear whether this pattern can be applied across all types of siblings. Additionally, future research may want to consider the interaction between sibling type and other important sibship characteristics that these analyses controlled for but did not focus on, such as gender composition and birth order, with regard to sibling relationship quality.

Future research would benefit from using more recent samples of siblings, as well as a more representative sample to further investigate the association between sibling type and sibling relationship quality, and the influence of sibling type and sibling relationship quality on mental health in young adulthood. Another improvement for future research would be to measure each aspect of relationship quality using multiple questions, rather than single-items, like much of the current analyses. Future research should examine the possible reciprocal associations between sibling relationship quality and mental health and self-concept, as well as consider other measures of well-being such as reports of happiness, life satisfaction, or personal health. Additionally, future research may also benefit from focusing on twins, who were not the focus of these analyses, when considering the different sibling types.

Contributions and Conclusions

These analyses contribute to the existing body of research by utilizing unique, large-scale, longitudinal, national, matched sibling data that included both the respondents' and their siblings' life course statuses, and other demographic and sibship characteristics in Chapter III, and additionally, reports of depression and self-esteem in Chapter IV; Chapter II used large scale, national data that provided a large sample and included information about residential sibling relationship quality, family characteristics, and demographic and sibship characteristics. This dissertation improves upon past research that generally combined half-siblings and step-siblings in their analyses by analyzing half-siblings, step-siblings, and full-siblings separately. Chapter II analyses captured variation in sibling relationship quality in adolescence between respondents with only residential full-siblings, respondents with residential half-siblings (but no step-siblings), and respondents with residential step-siblings, while Chapter III and Chapter IV analyzed variation in sibling relationship quality in young adulthood and variation in reports of depression and self-esteem between full-, half-, and step- sibling pairs.

My findings suggest that half-siblings who lived together during adolescence and step-siblings who lived together during adolescence have significant differences and should be analyzed separately when possible. Additionally, it seems that half-siblings who lived together during adolescence differ more from step-siblings who lived together during adolescence than full-siblings who lived together during adolescence, and, if family characteristics, such as mother-child relationship quality and the sense of family belonging are the same, relationships between half-siblings and full-siblings may be more similar than researchers have assumed. While past research looking at adolescent well-being has found that half-siblings are distinct from both full-siblings and step-siblings (Cooksey & Fondell, 1996; Halpern-Meekin & Tach,

2008; Hofferth, 2006), there has not been research that specifically compares relationship quality among full-siblings to half-sibling and step-siblings separately, while also comparing half-siblings to step-siblings. In doing so, I have found that other family characteristics equal, half-siblings are not only distinct but that relationships between half-siblings are more similar than different to relationships with full-siblings, both in adolescence and in young adulthood.

Despite the notable differences between different types of siblings, sibling type does not necessarily operate in the way that I expected it to on the basis of prior theoretical ideas, suggesting that we might need some revisions in conceptualization of half-sibling or step-sibling relationships. In adolescence, step-siblings spent more time together than half-siblings and did not differ from full-siblings in time spent together. Analyses provided in the appendix reflected that family structure can also influence reports of sibling relationship quality. Additionally, fights with siblings do not necessarily reflect a negative aspect of relationship quality. Instead, fights may actually be a positive aspect of sibling relationships and may reflect closer rather than more distant relationships. For example, there was a positive association between fights in adolescence and emotional closeness between siblings in young adulthood. Further, my analyses reflect that fights between siblings in adolescence influenced lower reports of depression and influenced higher reports of self-esteem in young adulthood.

Another strength of my analyses is that multiple aspects of sibling relationship quality are examined in each chapter. Each of these aspects operates in a unique manner, especially when considering variation by sibling type. Knowing that fights do not operate as hypothesized, it further strengthens my argument that it is important to separate different aspects of sibling relationship quality, rather than grouping them all together and creating a scale. Additionally, context matters for sibling relationship quality. I did not place much emphasis on my control

measures, as much research had already examined these factors. However, I do think it worth noting that in addition to sibling type, factors such as birth order and gender composition are always important to consider if we want to meaningfully interpret sibling relationships. My analyses not only consider variation by sibling type and examine associations for sibling relationship quality separately, they also control for the measures that have been established in the sibling relationship research.

The entirety of the analyses conducted in this dissertation contribute to the existing bodies of family, sibling, and mental health research. Chapter II contributes to the existing research by incorporating residential sibling type in the sibling relationship and family characteristics literature. Similarly, by differentiating by sibling type while using a longitudinal sample of matched siblings, Chapter III and Chapter IV contribute to the sibling relationship literature that has largely focused on full-siblings or grouped half-sibling and step-siblings together. Further, Chapter IV helps build upon the sibling relationship and mental health literature, by considering the longitudinal influence of sibling relationship quality on an individual's well-being. The findings suggest that, other family characteristics equal, step-siblings who lived together during adolescence are different from both half-siblings and full-siblings who lived together during adolescence, while half-siblings and full-siblings who lived together during adolescence are more similar than different in both adolescence and adulthood. Additionally, having close sibling relationships and fighting with siblings in adolescence is generally associated with better self-esteem and fewer reports of depression in young adulthood, with some differences and variation by sibling type. Finally, the analyses across all chapters suggest the importance of separating half-siblings and step-siblings when possible in order to

have a more nuanced understanding of sibling relationships in the increasingly complex family relationships in the United States.

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APPENDIX A. ALTERNATE COMPOSITIONS OF SIBLING TYPE CATEGORIES

Table A1. Alternate Compositions of Sibling Type Categories

Sibling Type	Proportion of Full Sample	n
Full-siblings only	0.835	7015
Half-siblings only[a]	0.061	511
Half-siblings & Full-siblings[a]	0.024	204
Step-siblings only[b]	0.043	362
Full-siblings & Step-siblings[b]	0.032	267
Half-siblings & Step-siblings[b]	0.003	28
Full-siblings, Half-siblings, & Step-siblings[b]	0.002	15
Total Sample	1.000	8402

[a] The two categories, "Half-siblings only" and "Half-siblings & Full-siblings", are included in "Half-siblings" in the analysis.

[b] The four categories, "Step-siblings only", "Full-siblings & Step-siblings", "Half-siblings & Step-siblings", and "Full-siblings, Half-siblings, & Step-siblings", are included in "Step-siblings" in the analysis.

APPENDIX B. FAMILY STRUCTURE

Table B1. Sibling Type by Family Structure

	Family Structure							
Sibling Type	Two Biological Parents	Biological mother & stepfather	Biological mother only	Biological father & stepmother	Biological father only	Other	Total	N
Have full-siblings only	67.13%	7.68%	18.56%	1.31%	2.27%	3.05%	100%	7015
Have half-siblings	19.16%	33.57%	35.94%	2.66%	2.66%	6.01%	100%	715
Have step-siblings	18.90%	27.23%	11.16%	13.99%	2.68%	26.04%	100%	672
Total sample	59.19%	11.45%	19.45%	2.44%	2.33%	5.14%	100%	8402

APPENDIX C. DESCRIPTIVE COMPARISONS OF ANALYTIC AND DROPPED SAMPLES

Table C1. Descriptive Statistics for Selected Variables for Those in the Analytical Sample and Those Who Were Dropped: Add Health Wave III

	Matched		Not matched (dropped)	
	M	*SD*	*M*	*SD*
Depression Wave III (0-3)	0.70	0.40	0.70	0.41
Self Esteem Wave III (1-5)	4.22	0.57	4.24	0.57
Respondent's age (18-27)	21.83	1.79	21.96	1.77
Respondent Female	0.53		0.51	
Respondent White	0.51		0.52	
Respondent Black	0.25		0.24	
Respondent Hispanic	0.15		0.15	
Respondent Other Race	0.09		0.09	
Respondent's Education (1-5)	2.89	1.21	2.95	1.20
Respondent Work Hours (0-60)	26.63	19.35	27.27	19.37
Respondent Single	0.66		0.67	
Respondent Cohabiting	0.16		0.15	
Respondent Married	0.17		0.17	
Respondent Parent	0.36		0.34	

Notes. Data are not weighted. Sample design is not corrected. Chapter 3.