Experiences of Sibling Relational Victimization in European American Families:

Longitudinal Associations with Family and Friendship Dynamics in Adolescence

by

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ABSTRACT

Sibling relationships are important units of socialization during adolescence. These involuntary relationships consist of positive and negative relationship qualities (Buist & Vermande, 2014; Deater-Deckard et al., 2002; Updegraff et al., 2005a), and some dimensions of these relationships are less understood than other dimensions. One dimension in need of attention is that of sibling relational victimization, which includes behaviors aimed at harming one's sibling relationship during a period in which interpersonal relationships are developmentally salient (Collins & Steinberg, 2006; Crick, 1995; Crick & Grotpeter, 1995). In my dissertation, I examine the associations between family and friendship dynamics and sibling relational victimization longitudinally during adolescence.

In study 1, I examined the developmental change in sibling relational victimization experiences during adolescence, and tested the associations between parent-youth and sibling conflict and intimacy and sibling relational victimization longitudinally. Sibling structural characteristics were explored as moderators. Using longitudinal growth and multi-level modeling, I found that sibling relational victimization decreased across adolescence for both siblings, with younger siblings reporting higher frequency of sibling relational victimization relative to older siblings. On a general level, parent-adolescent and sibling intimacy and conflict were associated with sibling relational victimization, albeit in different ways for mixed- and same-gender dyads and older and younger siblings. Overall, findings from study 1 highlight the importance of examining parent-youth and sibling relationship dynamics, the vulnerability of younger siblings as victims of sibling relational victimization, and the interplay of sibling gender

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dynamics and father-youth relationships on sibling relational victimization experiences in adolescence.

In study 2, I examined whether sibling relational victimization and negativity moderate the associations between parent-adolescent conflict and friendship control, conflict, and perspective taking in adolescence. Variation by sibling birth order and gender also was explored. Using path analytic models, I found that mother-adolescent, sibling, and friendship dynamics were interlinked, such that mother-adolescent conflict in combination with sibling negativity and sibling relational aggression were associated with friendship outcomes, albeit differently by sibling gender and friendship outcome. Findings from study 2 suggest the importance of addressing negative mother-adolescent and sibling relationship dynamics in prevention and intervention curricula aimed at promoting positive friendship dynamics during adolescence.

DEDICATION

I would like to dedicate this work to my best friend and husband, Robert, and to our little

boy, John Kee.

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DISSERTATION OVERVIEW

Adolescent siblings serve as daily companions in the lives of developing youth, offering unique contributions to each other's adjustment and development in many ways. For example, sibling relationship dynamics are associated with adolescent risk behavior engagement, friendship experiences, and romantic relationship qualities (Doughty et al., 2013; Solmeyer et al., 2014, Updegraff et al., 2004). Sibling relationships include both positive *and* negative relationship qualities (Buist & Vermande, 2014; Deaker-Deckard & Dunn, 2002; Garcia et al., 2000; Updegraff et al., 2005a), which are associated with the development and practice of various interpersonal and social behaviors (Bandura, 1977; McHale et al., 2012). While some dimensions of the sibling relationship have received more empirical attention than others, one relationship dimension that has received less attention in adolescence is sibling relational victimization. To address this limitation and the associations between sibling relational victimization and family and friendship dynamics, this dissertation aims to contribute two empirical studies that examine the experiences of sibling relational victimization longitudinally in adolescence.

Sibling relational aggression includes behaviors that are intended to harm one's sibling by damaging one's close relationships through manipulation, exclusion, withdrawing support and/or acceptance, and spreading rumors and/or gossip about an individual to elicit rejection (Crick, 1995; Crick & Grotpeter, 1995). Some cross-sectional research has found links between sibling relational aggression and parent-adolescent relationship dynamics, such that lower levels parental acceptance and higher levels of maternal psychological control are associated with higher levels of relational aggression and victimization (Campione-Barr et al., 2014; Updegraff et al., 2005a; Yu &

Gamble, 2007). However, longitudinal research is also warranted, as it would provide greater insight into the experiences of sibling relational victimization and interpersonal dynamics across the developmental period of adolescence.

Sibling relational victimization is important to study during the developmental period of adolescence for several reasons. First, adolescents, when compared to children, hold more sophisticated cognitive skills that enable the covert use of these behaviors (Campione-Barr et al., 2018). Further, the experience of sibling relational victimization may be particularly detrimental to youth in adolescence, as relationally aggressive behaviors undermine the development and maintenance of interpersonal relationships, which are of importance during this developmental period (Collins & Steinberg, 2006; Sullivan, 1953). Further, the covert nature of this form of aggression makes it harder for parents to recognize and intervene, allowing experiences of victimization to continue without detection in the home. In accordance with social interactional theory (Patterson et al., 1984), aggressive behaviors that are practiced in the home may cross into other social contexts, such as peer relationships. Thus, experiences of sibling relational victimization have potential implications for youth functioning both inside and outside the home, which calls for further examination.

To date, research examining sibling relational victimization has not yet explored developmental change in this construct across adolescence. To address this, the first study of this dissertation will examine the developmental change in sibling relational victimization during adolescence, while also accounting for sibling structural characteristics that may moderate this change across time (i.e., sibling birth order, sibling gender, and sibling gender constellation). This information may be particularly beneficial

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to intervention and prevention programming aimed at developing age-appropriate materials to address these sibling dynamics.

In accordance with family systems theory (Cox & Paley, 1997; Minuchin, 1985), disruption or negativity in one family subsystem has potential to spill over into another family subsystem, such that negativity or conflict within the parent-adolescent subsystem may contribute to negativity or conflict within the sibling subsystem. Parents and siblings are important in adolescents' daily and social lives, yet there is limited research on the associations between parent-adolescent *and* sibling relationship dynamics. As parent-youth conflict increases during adolescence (Shanahan et al., 2007b), and as sisters and brothers are sources of both intimacy and conflict (McHale et al., 2012), it is important to examine the associations between these interrelated relationships and the contributions to future interpersonal experiences in the home. Accordingly, the first study of this dissertation also will explore parent-youth and sibling relationship qualities of conflict and intimacy, and how these relationship qualities predict sibling relational victimization longitudinally. By examining multiple family relationships and indicators of both positive and negative relationship qualities, this study will provide insights on the family relationship contexts in which sibling relationship victimization may be most prevalent.

The second study of this dissertation examines the implications of negative parent and sibling relationship dynamics on peer relationships. Also guided by social learning (Bandura, 1977) and family systems theories (Cox & Paley, 1997; Minuchin, 1985), this study will explore how sibling relational victimization and sibling negativity moderate the associations between parent-adolescent conflict and friendship control, conflict, and perspective taking in adolescence. This study will also examine how these associations

will vary by birth order (younger vs. older sibling) and youth gender (male vs. female), which will provide greater insight regarding the conditions under which these associations exist. Study two of this dissertation is a valuable contribution to parent, sibling, and peer literature, highlighting how the interactions among family subsystems may be linked to peer relationships during an important developmental period for friendship formation and maintenance. Finally, through illuminating the links between various experiences of interpersonal conflict in the home and peer dynamics outside the home, intervention and prevention programming aimed at promoting peer relationships may benefit by first addressing underlying conflictual family dynamics.

Paper #1: Sibling Relational Victimization: Developmental Change and Associations with Family Relationships in Adolescence

Siblings serve important roles in the lives of developing youth. As the majority of youth grow up in a home with at least one sibling (McHale et al., 2012), and adolescents spend about 45 minutes together daily alone with their siblings (Wikle et al., 2019), the sibling relationship is a potentially important social context in which youth may learn and engage in various interpersonal behaviors, for better or for worse. While research has documented that sibling relationships consist of both positive *and* negative qualities, one negative relationship quality that is potentially important in adolescence, but understudied, is sibling relational victimization (Campione-Barr et al., 2014; Gallagher et al., 2018; Updegraff et al., 2005a; Yu & Gamble, 2008). Relational victimization may be particularly detrimental during adolescence, a period of interpersonal relationship development (Collins & Steinberg, 2006; Sullivan, 1953).

Family systems theory (Cox & Paley, 1997; Minuchin, 1985) posits that sibling and parent relationships do not occur in isolation, and instead, disruption or negativity in one family subsystem has potential to spill over to another family subsystem. Although sibling relational victimization has received limited empirical attention, some research has found links between other family relationships (e.g., maternal psychological control, parent-youth acceptance) and sibling relational victimization using cross-sectional data (Campione-Barr et al., 2014; Updegraff et al., 2005a; Yu & Gamble, 2008). Building on these findings, this study examined the developmental change in sibling relational victimization from early to late adolescence and the links between parent-adolescent and sibling relationship qualities (i.e., warmth/intimacy and conflict/negativity) and sibling

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relational victimization longitudinally to advance our understanding of the family relationship dynamics in which sibling relational victimization occurs.

Goal 1: Developmental Change in Sibling Relational Victimization in Adolescence

Sibling relational victimization consists of behaviors that are intended to harm one's sibling by damaging his/her close relationships through manipulation, exclusion, withdrawing support and/or acceptance, and spreading rumors and/or gossip about an individual to elicit rejection (Crick, 1996; Crick & Grotpeter, 1995). The limited study of relational victimization among siblings in adolescence is surprising given it is a developmental period when youth make advances in cognitive skills and experience declines in direct parental supervision (Kuhn, 2009; Steinberg, 2005), which may lead to opportunities to learn and practice relational victimization. Relational victimization may be an effective strategy for control among adolescent siblings who have personal information about one another, given their shared history and time within the home. This information may be disclosed to others to cause harm to one's sibling, similar to the application of relational victimization among peers (Campione-Barr et al., 2018).

The experience of sibling relational victimization is likely to change across the developmental period of adolescence as a result of developmental changes occurring in each sibling and in the dynamics of their relationship. Youth in adolescence experience many biological, social, and cognitive changes (Steinberg, 2005), with potential implications for experiences of sibling relational victimization. For example, increased cognitive skills and abstract thinking (Smetana & Villalobos, 2009) may contribute to the sophisticated use of manipulation in social relationships, yet cognitive advancements in social perspective taking in later adolescence may contribute to decreases in the use of

this construct (Choudhury et al., 2006). Intertwined with these individual changes are developmental changes in sibling relationships, including increases in egalitarianism and declines in conflict and contact, which may have implications for trajectories of sibling relational victimization (Buhrmester & Furman, 1990; Kim et al., 2006). To understand the change in sibling relational victimization experiences across adolescence, this study charted the developmental trajectory of sibling relational victimization from ages 11 to 19 years old. It was predicted that sibling relational victimization experiences would be highest in early adolescence and decline across time for both siblings. In early adolescence (11-13 years of age), youth may experience more relational victimization than in middle adolescence (14-16 years of age), as youth in middle adolescence are spending more time with peers and are focused on the world beyond the home, which may result in lower levels of sibling involvement and lower levels of negative relationship experiences (Brown & Larson, 2009; Smetana et al., 2006). In late adolescence (17-19 years of age), youth may begin to transition out of the home and into emerging adulthood, where seeking independence from the family increases and sibling contact decreases (Lindell & Campione-Barr, 2017). In sum, the continued progression and focus on relationships and experiences outside the home may contribute to declining experiences of sibling relational victimization.

In studying the development of sibling relational victimization, it is also important to account for sibling and dyad characteristics that may moderate change in these experiences, such as sibling birth order, youth gender, and gender constellation. Birth order characteristics, such as being the older or younger sibling in a sibling dyad, consists of two siblings at varying places of development. Older siblings may be better equipped

to engage in the sophisticated relationally aggressive behaviors given their more advanced cognitive abilities, such as more refined social skills (Bjorkqvist et al., 1999). Further, older siblings have higher status in the sibling dyad (McHale et al., 2012), and as such, may engage in more relationally aggressive behaviors towards their younger siblings to maintain their higher status. Finally, older siblings may have more practice in engaging in these behaviors, given their prior entry into adolescence and increased time interacting with peers. Thus, it was predicted that younger siblings would be the target of relational victimization by their older siblings to a greater degree, then vice versa, and report more relational victimization in their sibling relationship.

Although gender differences in the use and experience of relational victimization has been documented in peer relationships (Archer & Coyne, 2005; Crick & Grotpeter, 1995; Murray-Close et al., 2007; Orphinas et al., 2015), research on *sibling* relational victimization has yet to find significant differences between males and females in the frequency of relational victimization (Aizpitarte et al., 2019; Campione-Barr et al., 2014; Gallagher et al., 2018; Updegraff et al., 2005a; Yu & Gamble, 2008). Gender differences in the peer context may be explained by gender socialization, such that it is normative for males to engage in physical aggression, while females may be encouraged to use more covert and less physical forms of aggression, such as relational aggression (Casas & Bower, 2018). Further, the majority of literature on relational victimization among peers focuses on same-gender peer interactions, which unsurprisingly captures sex-typed aggressive behaviors (i.e., higher levels of physical aggression perpetrated by males and relational aggression perpetrated by females; Archer & Coyne, 2005; Crick & Grotpeter, 1995). However, sibling relationships consist of both same- and opposite-sex dyad

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constellations, which provide youth with the opportunity to experience aggressive behaviors by a member of opposite-sex, which is less common in the largely gender segregated peer context in adolescence (Dunphy, 1963; Steinberg & Morris, 2001). Although sibling gender and dyad constellation were examined as potential moderators, gender differences in sibling relational victimization were not expected based on prior work (Aizpitarte et al., 2019; Campione-Barr et al., 2014; Gallagher et al., 2018; Updegraff et al., 2005a; Yu & Gamble, 2008).

To examine how sibling relational victimization may change over time, this study utilized adolescents' self-reports of their experiences as the *target* of relationally victimization from their sibling. As compared to observational methods often used during childhood (Ostrov et al., 2006; Ostrov & Keating, 2004; Stauffacher & DeHart, 2005), this strategy provides insight into adolescents' perceptions of relationally aggressive behaviors enacted towards them by their sibling. In addition, examining various sibling structural characteristics, such as developmental change as a function of birth order, sibling gender, and sibling gender constellation, provided insight about sibling and dyad characteristics that are important to consider in intervention and prevention programming aimed at promoting positive sibling relationship qualities.

Goal 2: Parent-Youth Dynamics and Sibling Relational Aggression

From a family systems perspective, sibling relationships are embedded within the multi-layered family system that includes different subsystems ranging from individuals to dyads, triads, and larger family systems (Cox & Paley, 1997; Fosco & LoBraico, 2019; Minuchin, 1985). Research drawing on family systems tenets documents links between parent-adolescent and sibling subsystem dynamics (Kim et al., 2006; Yu & Gamble,

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2008), including concurrent associations between parent-adolescent relationship qualities and sibling relational victimization (Campione-Barr et al., 2014; Updegraff et al., 2005a; Yu & Gamble, 2008). Building on prior work, this study tested the associations between parent-adolescent intimacy and conflict and sibling relational victimization using longitudinal data, and examined potential moderation by sibling gender, birth order, and sibling dyad constellation.

Research on the family contexts of sibling relational and physical aggression suggest that positive relational dynamics, including cohesion, emotional support, and connectedness among family members, predict lower rates of aggression (Jester et al., 2005; Park et al., 2005; Yu & Gamble, 2008). Indeed, cross-sectional evidence documents a link between greater family cohesion and emotional expressiveness (Yu & Gamble, 2008) and higher levels of maternal and paternal acceptance (Updegraff et al., 2005a) and lower levels of sibling relational victimization (Updegraff et al., 2005a; Yu & Gamble, 2008). In line with social learning theory (Bandura, 1977), youth learn socio-emotional skills in their relationships with parents, such as expressing one's emotions, demonstrating and receiving support and acceptance, and these relationship skills can be applied to other relationships (Kim et al., 2006; Stocker & McHale, 1992). In families where youth have close and supportive relationships with parents, they may have developed greater socio-emotional relationship competencies and be less likely to engage in covert and relationally aggressive behaviors towards their siblings. It is also possible that, in the context of high levels of parent-youth intimacy, youth may share with their parents about sibling relational victimization, and in turn, parents may be able to address and deter such behaviors. Given adolescents are more likely to share feelings and disclose

personal information to their mothers than their fathers (Laursen & Collins, 2009; Smetana et al., 2006), this study examined both mother- and father-youth intimacy in association with relational victimization. It was predicted that higher levels of parent-adolescent intimacy, particularly mother-adolescent intimacy, would be associated with lower levels of sibling relational victimization. Moderation by sibling birth order, sibling gender, and sibling gender constellation was also be explored, given some evidence of differences in older versus younger siblings and siblings in mixed- versus same-sex dyads in family relationship qualities that may have implications for parent and sibling relationship associations (Shanahan et al., 2007a).

Another key dimension of the parent-adolescent relationship is conflict, which also may be related to sibling relational victimization. Although the links between parent-adolescent conflict and sibling relational victimization have yet to be examined, related research documents associations between parent-adolescent and sibling negativity. For instance, mother-youth negativity is positively associated with sibling conflict longitudinally for male adolescents (Criss & Shaw, 2005), and father-youth conflict is positively associated with sibling conflict longitudinally for both male and female adolescents (Kim et al., 2006). During adolescence, youth experience an increase in conflict with parents, often around issues of autonomy and authority (Shanahan et al., 2007b; Smetana, 2011). As the parent-youth and sibling relationships are interrelated subsystems, it is important to examine how negative behaviors may be related within these family subsystems. In accordance with family systems tenets on the interdependence among family relationships (Cox & Paley, 1997; Minuchin, 1985) and social learning theory (Bandura, 1977), it was predicted that higher levels of mother-

adolescent and father-adolescent conflict would predict higher levels of relational victimization among siblings. Moderation by sibling gender and dyad gender constellation was explored, but beyond evidence of higher levels of conflict with mothers relative to fathers (Shanahan et al., 2007b), there was not clear evidence that the strength of associations between parent-youth conflict and sibling relational victimization would differ by parent gender.

Goal 3: Sibling Dynamics and Sibling Relational Aggression

Sibling relationships are multi-dimensional, and include positive relationship qualities, such as intimacy and support (McHale et al., 2012; Updegraff et al., 2002b), and negative relationship qualities, such as conflict and negativity (Buist & Vermande, 2014; Deater-Deckard et al., 2002; Garcia et al., 2000; Updegraff et al., 2002b). The third goal of this study was to examine the relation between these commonly studied dimensions of the sibling relationship (i.e., intimacy, negativity), and relational victimization among siblings. Guided by social learning mechanisms (Bandura, 1977), one study documented significant associations between sibling relationship qualities and sibling relational victimization using cross-sectional data, such that relational victimization was associated with higher levels of conflict and lower levels of intimacy among siblings (Updegraff et al., 2005a). Building on this, the current study aimed to examine the links between sibling intimacy, conflict, and relational victimization longitudinally, while also testing for moderation by sibling gender, birth order, and dyad gender constellation. Understanding these associations, as well as the contributions of sibling structural characteristics, provides new insight on the links between sibling relationship qualities and relational victimization in adolescence.

Adolescence is a time when close friendship formation is an important developmental task (Collins & Steinberg, 2006; Sullivan, 1953), and relationally aggressive behaviors towards one's sibling that includes spreading rumors or sharing secrets with mutual friends may be particularly detrimental. One cross-sectional study suggests that lower levels of sibling intimacy between siblings is associated with higher concurrent levels of sibling relational victimization (Updegraff et al., 2005a), such that one's sibling may use personal information to intentionally harm their sibling by spreading rumors or revealing secrets among mutual friends. In the context of lower sibling intimacy, youth may engage in relationally aggressive behaviors because they do not perceive their sibling relationship as supportive and valuable. For this reason, it was expected that lower levels of sibling intimacy would predict higher levels of sibling relational victimization longitudinally. Additionally, these associations were expected to be stronger for younger siblings as compared to older siblings, who are of lower status in their sibling dyad, making them particularly vulnerable to relational victimization, as they are more likely to look up to and admire their older siblings than the reverse (McHale et al., 2012). Only one study to date has tested moderation by sibling birth order (Updegraff et al., 2005a), and although no significant differences emerged, a longitudinal examination of moderation provides a more stringent test of these associations. Thus, moderation by sibling structural characteristics (i.e., birth order, sibling gender, and sibling gender constellation) will be explored.

Moving to sibling conflict, research has consistently shown that males and females report similar levels of sibling conflict through late adolescence, and sibling conflict decreases from middle and late adolescence into emerging adulthood (Furman &

Buhrmester, 1992; Kim et al., 2006; Parker et al., 2012; Scharf et al., 2005; Stewart et al., 2001). Siblings most often engage in conflictual behaviors around fairness and the protection of their personal domains, such as property or space (e.g., borrowing an item or going into ones' room without permission; Campione-Barr & Smetana, 2010), while siblings who engage in relational aggression use these behaviors to gain control, exclude, or manipulate (Crick, 1995; Crick & Grotpeter, 1995). These two negative sibling relationship qualities hold different functions but may be used together to control or manipulate one's sibling in an attempt to protect personal domains. Accordingly, it was predicted that higher levels of sibling conflict would be associated with higher levels of sibling relational victimization longitudinally, however, these associations were predicted to be stronger for younger siblings, who are of lower status when compared to older siblings.

The Current Study

The current study had three goals. The first goal was to examine developmental change in sibling relational victimization across adolescence, an understudied sibling relationship construct. It was predicted that sibling relational victimization experiences would be highest in early adolescence and would decline over time for both siblings. It was also predicted that birth order would moderate, such that younger siblings, on average, would report being the more frequent target of relational victimization relative to older siblings. Further, sibling gender and sibling dyad constellation were explored as moderators, but no hypotheses were advanced.

The second goal was to assess the links between mother-adolescent and father-adolescent intimacy and conflict and sibling relational victimization using longitudinal

data. For this goal, moderation was explored by sibling gender, birth order, and dyad gender constellation. It was predicted that higher levels of parent-adolescent intimacy, particularly mother-adolescent intimacy, would be associated with lower levels of relational victimization. Turning to mother-adolescent and father-adolescent conflict, it was expected that higher levels of conflict would be associated with higher levels of relational victimization among siblings, and that these associations would be stronger for mother-youth conflict and sibling relational victimization. However, moderation by sibling dyad characteristics were exploratory, given the similar nature of parent-youth conflict across sibling birth order and gender (Laursen & Collins, 2009; Steinberg & Silk, 2002; Shanahan et al., 2007b).

The third goal was to examine whether sibling intimacy and conflict was related to sibling relational victimization longitudinally. It was expected that lower levels of sibling intimacy and higher levels of sibling conflict would be associated with higher levels of sibling relational victimization. Both of these associations were expected to be stronger for younger siblings, who have less power/status relative to their older siblings. In accordance with prior research examining gender differences in sibling relational victimization, moderation by sibling gender and sibling gender constellation were not expected but were explored.

Materials and Methods

Participants

The data came from a larger longitudinal study of family relationships and youth development (i.e., the Penn State Family Relationships Middle Childhood Project; Crouter et al., 1999). Participants were recruited through letters sent home to fourth- and

fifth-grade students in 16 school districts in the northeastern US. The letters described the study and criteria for participation (i.e., firstborn child in 4th or 5th grade with a secondborn sibling one to four years younger, and an intact marriage) at the time of recruitment. Interested families returned a postcard, and of those families who were eligible and responded, over 90% agreed to participate ($N = 203$). Data for the present analyses included the 196 sibling pairs who participated in waves 6, 7, and 8 of the larger study (97% of the original sample at Wave 1), the only timepoints when measures of sibling relational victimization were collected. The six excluded sibling pairs did not provide data at waves 6, 7, and/or 8. For our purposes here, I refer to these waves as Times 1, 2, and 3 (T1, T2, T3) hereafter.

The sample was 95.5% White (4.5% other), corresponding with the racial composition of the region where the study was conducted (85% White; US Census Bureau, 2000). At T1, more than 80% of mothers and fathers had completed high school, and their average education levels were 14.58 years ($SD = 2.15$) and 14.67 years ($SD = 2.43$), respectively on a scale where 12 = high school graduate, 15 = some college and 16 = college graduate. Between recruitment and T1, six families experienced a parental separation or divorce and five families experienced a parental death. Median family income at time of recruitment was $55,000 ($SD = $28,613$), which was similar to the median income for married-couple families in the state ($55,714; US Census Bureau, 2000), and median family income at T1 was $78,489 ($SD = $35,060$). The average family size was 4.55 ($SD = .75$), with 113 families including only the two target siblings, and 80 families including at least one additional sibling. Older (firstborn) and younger (secondborn) siblings were 16.47 ($SD = .80$) and 13.88 ($SD = 1.15$) years of age at T1,

17.34 (*SD* = .80) and 14.77 (*SD* = 1.16) years at T2, and 18.38 (*SD* = .78) and 15.78 (*SD* = 1.13) years at T3, respectively. There were almost equal numbers of female (51.7%) and male (48.3%) siblings, and same-gender (48.3%) and mixed-gender (51.7%) sibling dyads. On average, siblings were about two-and–one-half years apart in age (*M* = 2.61, *SD* = .88).

Procedures

After obtaining informed consent and assent forms (for siblings under age 18), data were collected in home interviews where questions were read aloud, and participant responses were recorded on paper surveys. Interviews were conducted separately with each sibling and parent, which lasted an average of two hours. Families received $200 honorariums for participating at each time point.

Measures

Sibling Relational Victimization

Older and younger siblings completed a six-item scale to assess their perceptions of being the *target or victim* of relationally aggressive behaviors by their sibling in the past year (O'Brien & Crick, 1995; Updegraff et al., 2005a). Items were rated on a 5-point Likert scale (1 = *never;* 5 = *very often*) to indicate the frequency of each event (e.g., "he/she leaves me out of things when he/she is mad at me"; See Appendix B). Items were summed to create a measure of the overall frequency of relational victimization from one's sibling. Prior principal components analyses (Updegraff et al., 2005a) showed that this scale captured a distinct dimension of sibling relationships from intimacy and conflict. Cronbach's alphas ranged from .74 to .83. across siblings and timepoints.

Intimacy

Older and younger siblings completed an eight-item scale to assess their intimacy with their mother, father, and sibling over the past year, at separate points in the interview (Blyth et al., 1982). Items were rated on a 5-point Likert scale (1 = *never;* 5 = *very often*) to indicate their feelings of intimacy (e.g., "how much do you go to your mother/father/brother/sister for advice or support"). Items were summed to create a measure of the overall intimacy with each family member for each adolescent, with higher scores indicating greater intimacy. For adolescent reported intimacy with their mother, Cronbach's alphas ranged from .85 to .87 across siblings and timepoints. For adolescent reported intimacy with their father, Cronbach's alphas ranged from .81 to .89 across siblings and timepoints. For sibling intimacy, Cronbach's alphas ranged from .83 to .88 across siblings and timepoints.

Conflict

Older and younger siblings completed a 12-item scale to assess their frequency of conflict with their mother and father, separately (Smetana, 1988). Items were rated on a 5-point Likert scale (1 = *not at all;* 5 = *several times a day*) to indicate their frequency of conflict with the respective parent. Example parent-adolescent conflict items include: "problems about homework or getting good grades," and "problems about bad behavior or habits like being stubborn, talking too much, or disobeying rules." Items were summed to create a measure of overall parent-adolescent conflict, and higher scores indicate greater frequency of conflict. For adolescent-mother conflict, Cronbach's alphas ranged from .72 to 84 across siblings and time points. For adolescent-father conflict, Cronbach's alphas ranged from .78 to .85 across siblings and time points.

Older and younger siblings completed a five-item scale to assess their conflict with their sibling in the past year (Stocker & McHale, 1992). Items were rated on a 5-point Likert scale (1 = *never;* 5 = *very often*) to indicate the frequency of each event (e.g., "how often do you try to hurt your brother/sister by pushing, punching, or hitting him/her"). Items were summed to create a measure of the overall frequency of sibling conflict, and higher scores indicate greater frequency of conflict. Cronbach's alphas ranged from .69 to .78 across siblings and timepoints.

Moderators and Covariates

Three sibling structural characteristics were included to test for moderation: sibling gender (0 = *female;* 1 = *male*); sibling dyad constellation (0 = *mixed-gender;* 1 = *same-gender*); and birth order (0 = *older;* 1 = *younger*). For goals 2 and 3 of this study, covariates included sibling age spacing (i.e., older siblings' age in years minus younger siblings'), age at T1, and family socioeconomic status (SES). Family SES is calculated as the average of mothers' and fathers' reports of their education and annual family income (after transformation to correct for skewness) using T1 standardized variables.

Analytic Plan

First, the means and standard deviations of the variables were examined for assumptions of normality. Next, given the clustered nature of this data (time within sibling, siblings within families), multilevel modeling (MLM) using the PROC MIXED procedure in SAS 9.4 was used to address the goals of this study (Raudenbush & Bryk, 2002). This approach accommodates missing data, and thus effectively reduces biases and standard errors (Schafer & Graham, 2002). Missing data ranged from 3% to 8% across all variables in the study.

Goal 1

For the first goal, the developmental course of sibling relational victimization across adolescence was explored, using sibling age in years as the metric of time. As a first step, intraclass correlations were calculated to estimate the percentage of variance across timepoints (Level 1), siblings (Level 2), and sibling dyads (Level 3). Age was centered at 16, which is the mean age across siblings across time points, and a saturated means model was tested. This saturated means model is essentially an ANOVA model that estimates the mean pattern with the fewest parameters possible. Next, fixed effects were tested to examine the effect of age on sibling relational victimization, and random effects were tested to examine the variability of individuals from the average growth curve. Log likelihood comparisons of the nested models were used to determine which random effects to include in the final model. When a significant improvement in model fit as indicated by the log likelihood comparisons was found, the new model was retained and used for further analyses. To examine moderation by sibling structural characteristics, sibling gender, birth order, and dyad gender constellation were included in the same conditional growth curve models. Only significant covariates and interactions were retained in the final model (Aiken & West, 1991).

Goals 2 and 3

To address the second goal, two three-level models were tested, one model for parent relationship qualities and sibling relational victimization, and a separate model for sibling relationship qualities and sibling relational victimization, in a two-step process. As the first step, I tested both between- and within-person effects of intimacy and conflict on sibling relational victimization. Each relationship quality was indicated by two

variables: (a) the Level 1 indicator, which is a time-varying, group-mean centered (i.e., centered at each individual's cross-time average) variable, and (b) the Level 2 indicator, which is grand-mean centered (i.e., centered at the sample mean), cross-time average variable. By including both variables in the model, I was able to capture *within-person* variation using the Level 1 indicator, which is how an individual deviated from his/her cross-time average at each time point. Through the use of the Level 2 indicator, I explored *between-person* variation, or how the individual's cross-time average differed from the sample average. The Level 2 indicator also controls for stable individual differences in relationship quality. Additional Level 2 variables include sibling gender and birth order, and Level 3 includes dyad gender constellation (a between-family variable).

In the second step of each model, I tested the moderation of sibling birth order, sibling gender, and sibling gender constellation in the links between intimacy and conflict and sibling relational victimization. This was examined through the addition of interaction terms testing within-person and between-person intimacy and conflict terms by sibling structural characteristics (i.e., sibling gender, birth order, and dyad gender constellation).

<center>**Results**</center>

Preliminary Analyses

Tables 1 show the means, standard deviations, and bivariate correlations among sibling relational victimization, mother and father intimacy, and mother and father conflict. Older and younger siblings' reports of relational victimization at all three time points fell below the midpoint (i.e., below 18, range from 6 to 30) on the summed scale

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score, indicating relatively low levels of sibling relational victimization in this sample. Siblings' ratings of mother and father intimacy were above the midpoint (i.e., more than 24, range 8 to 40), and siblings' ratings mother and father conflict were almost 10 points below the midpoint of 36 (i.e., less than 27, range 12 to 60). These means indicate moderately high levels of adolescent-reported parental intimacy and low levels of adolescent-reported parental conflict. Turning to the correlations, the majority of correlations were significant and in the expected directions (i.e., more sibling relational victimization is associated with lower mother and father intimacy and higher mother and father conflict).

Tables 2 show the means, standard deviations, and bivariate correlations among sibling relational victimization, sibling intimacy, and sibling conflict. There were no significant gender differences in older or younger siblings' experiences as victims of relational victimization at T1, T2, or T3 (*t*-values ranged from .16 to .98, *p*-values ranged from .33 to .87). Siblings' reports of sibling intimacy and conflict were reported around the midpoint (i.e. 12.50 and 24, respectively) of the summed scale scores (i.e., possible ranges 5 to 25 and 8 to 40, respectively). The highest levels of sibling intimacy were reported at T3 for both siblings, and highest levels of sibling conflict was reported at T1. These means suggest increases in sibling intimacy and decreases in sibling conflict across adolescence in this sample. Turning to correlations, the majority of the correlations were significant, with more sibling relational victimization associated with the lower sibling intimacy and higher conflict, as expected.

Goal 1: Developmental Change in Relational Victimization Across Adolescence

Intraclass correlations

Intraclass correlations were analyzed to estimate the percent of variance at each level in this three-level model. At L1, 56.15% of variance is similar across youth in the study, suggesting change across time. At L2, 50.77% of the variance was similar between siblings. At L3, 39.40% of variance in the time points between families. These variances indicated that there was significant variance to be explained at each level in the model, and thus, multilevel modeling is appropriate.

Model comparisons

A series of eight models were tested to assess developmental change in relational victimization across adolescence, beginning with a baseline linear model with no random effects (Table 3, Model 1). Next, random intercepts for siblings at L2 were added (Table 3, Model 2) and model fit was assessed using log likelihood comparisons to determine whether random intercepts significantly improved the model. When comparing the model with random intercepts for siblings at L2 to the baseline model with no random intercepts, the results suggest that allowing these random intercepts for siblings significantly improved model fit, $\chi^2(2) = 378.2$, $p < .005$, and this model was retained moving forward. Moving to random slopes (Table 3, Model 3), adding a random slope at L2 for individuals significantly improved model fit, however, the L2 linear slope variance did not converge. Next, the testing for random slopes at L3 for sibling dyads was not significant (Table 3, Model 4), and the slope variance also did not converge. Additional models were tested to assess the additions of random slopes at L2 and L3 (Table 3, Model 5) and a quadratic effect, L2 random linear slope, and slope polynomial term

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(Table 3, Model 6), but none of these models significantly improved model fit and their respective variances did not converge. As L2 and L3 did not include linear slopes, quadratic terms were not tested at those levels. Thus, the selected growth model included a fixed linear term for age and random intercepts for siblings.

Using the selected growth model described above, covariates (gender, birth order, and dyad constellation) were included along with interaction terms to examine gender by sibling victimization, birth order by sibling victimization, and sibling dyad constellation by sibling victimization interactions (Table 3, Model 7). None of the interaction terms were significant and were removed, but birth order was a significant covariate and thus retained in the final model (Table 3, Model 8). Figure 1 shows the linear trajectory of sibling relational victimization as a function of age. The intercept for older siblings when age is centered at 16 is 11.98, which is under the midpoint (i.e., below 18) on the summed score scale of relational victimization (i.e., possible range from 6 to 30). The intercept difference between older and younger siblings when age is centered at 16 was -0.78 and statistically significant, $t(463)=-2.23$, $p = .03$, with younger siblings reporting higher sibling victimization than older siblings. There was no significant difference in slopes by birth order, $t(974)=-1.83$, $p = .07$. Instead, for both siblings on average, the slope suggests that a one-unit increase in age is associated with a 0.66 decrease in relational victimization over time, $t(1052)=-7.61$, $p < .0001$. In sum, these findings indicate that younger siblings report being the victim of relational victimization from their sibling at higher rates at age 11, but both siblings report similar rates of decline across adolescence.

Goal 2: Parent-youth Dynamics and Sibling Relational Victimization

In presenting the results of the following models, only statistically significant effects are discussed. All variations of sibling structural characteristics were tested as moderators and covariates within our models. Further, socioeconomic status, age at T1, and sibling age spacing were included in all models as covariates but were nonsignificant.

The first model (Model 1a in Table 4) included main effects and the final model (Model 1b in Table 4) included main effects and significant interactions. For mothers, there were significant effects for WP and BP conflict on relational victimization. First at the BP-level, siblings who reported more mother conflict also reported more sibling relational victimization, on average. At the WP-level, when siblings reported more mother conflict than usual (i.e. compared to their own cross time average), they also reported more experiences of sibling relational victimization than usual.

For relationships with fathers, there was a significant WP-level father intimacy main effect, which was qualified by an interaction with sibling dyad constellation. Follow-ups indicated that for mixed-gender dyads more father intimacy than usual was associated with *more* sibling relational victimization experiences than usual ($\gamma = 0.12$, *SE* $= 0.04$, $p < .05$). In contrast, on occasions when siblings in same-gender dyads reported *less* father intimacy than usual, they also reported more sibling relational victimization experiences than usual ($\gamma = -0.11$, *SE* $= .05$, $p < .05$). Additionally, a significant WP-level father conflict and interaction with sibling dyad constellation emerged. Follow-ups indicated that on occasions when siblings in mixed-gender dyads reported more father conflict than usual, they also reported more sibling relational victimization experiences

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than usual (γ = 0.13, *SE* = .04, *p* < .01), but this interaction was not significant for same-gender dyads (γ = 0.02, *SE* = .04, *p* = .58).

Goal 3: Sibling Dynamics and Sibling Relational Victimization

The initial model (Table 5, Model 1a) included main effects and the final model (Table 5, Model 1b) included main effects and the significant interaction. For sibling intimacy, there was a BP effect, such that siblings who reported less sibling intimacy also reported more sibling relational victimization, on average. The significant WP intimacy effect was moderated by birth order, such that there was a significant negative association for younger siblings, γ = -0.19, *SE* =0 .03, *p* < .0001, but not for older siblings, γ = -0.02, *SE* = 0.04, *p* = .70.

At the BP- level, siblings who reported more sibling conflict also reported more sibling relational victimization, on average. At the WP-level, results indicated that on occasions when siblings reported more sibling conflict than usual, they also reported more sibling relational victimization experiences than usual. No significant interactions emerged between sibling relational victimization, sibling birth-order, dyad constellation, or sibling gender for sibling conflict.

Discussion

Sibling relational victimization is an understudied sibling construct that is important during the developmental period of adolescence, a time of interpersonal relationship development (Collins & Steinberg, 2006). The findings of this study contribute to research on sibling relational victimization in two important ways. First, developmental change in sibling relational victimization is examined from early to late adolescence to document how sibling relational victimization may change across

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adolescence. Second, framed within a family systems perspective (Cox & Paley, 1997; Fosco & LoBraico, 2019; Minuchin, 1985), this study examined the interrelations among sibling relational victimization and parent-child and sibling relationship dynamics, including relationships with both mothers and fathers. The findings show that sibling relational victimization decreases across adolescence for both siblings. Further, this study documented the interconnections among the mother-youth, father-youth, and sibling subsystems as well as the moderating role of birth order and sibling gender constellation. Altogether, these findings provide new insights into family dynamics linked to sibling relational victimization in adolescence and provide directions for future prevention and intervention programs aimed at decreasing negative and increasing positive family dynamics.

Goal 1: Developmental Change in Relational Victimization Across Adolescence

The first goal of this study was to examine the developmental change in sibling relational victimization across adolescence. Consistent with evidence of decline in sibling relationship conflict among European American siblings (Kim et al., 2006), there was a significant decline in sibling relational victimization as reported by both older and younger siblings over the three-year period studied here. Further, on average, younger siblings reported more relational victimization in early adolescence as compared to older siblings. This pattern is consistent with research on sibling dynamics showing that older siblings hold a higher status in the sibling dyad and are better equipped to engage in sophisticated relationally aggressive behaviors given their more advanced cognitive abilities (Bjorkqvist et al., 1999). However, over this three-year period, increases in egalitarianism within the sibling dynamic may lessen the unequal power dynamics among

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older and younger siblings that may lend to sibling relational victimization (Buhrmester & Furman, 1990). Alternatively, in early adolescence, both siblings may have more exposure to one another within the home, thus lending to greater sibling involvement and higher incidences of victimization, as compared to late adolescence, when youth begin to focus on life and relationships outside the home (Connolly & McIsaac, 2011). Although sibling relational victimization was shown to decrease over time for both siblings, this study suggests a particular vulnerability for relational victimization of younger siblings in early adolescence, which may have long-term implications on adolescent adjustment. Given prior evidence linking sibling relational victimization to risky behavior engagement for younger siblings (Gallagher et al., 2018), these findings highlight the need for intervention and prevention programming to identify and address sibling relational victimization to promote healthy adjustment for siblings in early adolescence.

Goal 2: Parent-youth Dynamics and Sibling Relational Victimization

Grounded in family systems theory (Cox & Paley, 1997; Fosco & LoBraico, 2019; Minuchin, 1985), the findings of this study highlight links between parent-adolescent conflict and sibling relational victimization in adolescence. A strength of this study was the consideration of both between- and within-person associations, providing a more stringent test of the interrelations among family relationship dynamics. As predicted and consistent with prior research examining the effects mother-youth negativity on sibling conflict (Criss & Shaw, 2005), more mother-adolescent conflict was associated with more sibling relational victimization at both the within-person level, which captured differences in their own average score at each timepoint, and between-person level, which captured differences in their own average score from the rest of the sample. One

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explanation for these associations from a family systems perspective is that conflict in the mother-adolescent relationship spills over into and has negative implications for sibling relationship dynamics, as these two relationships are interlinked within the broader family system (Cox & Paley, 1997; Fosco & LoBraico, 2019; Margolin et al., 1996; Minuchin, 1985). Further, youth with conflictual relationships with their mothers may be less likely to seek help or to use their mothers as a resource in the context of greater sibling relational victimization, and in turn, mothers are not asked for assistance in addressing these negative sibling interactions. Finally, greater experiences of conflict within the mother-adolescent relationship may impede the development of socio-emotional relationship competencies (Weymouth et al., 2016), and lend to normalization of sibling relational victimization in one's sibling relationship.

Although it was anticipated that higher levels of mother-adolescent intimacy would be associated with lower levels of relational victimization, the current study did not find any associations. These findings are inconsistent with prior work using concurrent data from the same sample that found links between higher levels of mother-adolescent warmth and lower levels of sibling relational victimization (Updegraff et al., 2005a). However, the associations found in this study to father-youth intimacy *and* conflict, but only mother-youth conflict, is consistent with some research on sibling relationship qualities that suggests stronger linkages between the father-youth relationship and the sibling relationship when compared to the associations between mother-youth and sibling relationships (Stocker & McHale, 1992).

A different pattern of associations emerged between father-adolescent relationship dynamics and sibling relational victimization. Contrary to the prediction that more

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parent-adolescent intimacy would be associated with less sibling relational victimization because of links documenting higher levels of emotional support and connectedness among family members and lower rates of aggression (Jester et al., 2005; Park et al., 2005; Yu & Gamble, 2008), findings revealed a significant within-person effect for mixed-gender dyads such when they reported more father intimacy than usual they also reported *more* sibling relational victimization than usual. One interpretation of these findings, although not directly tested here, is that one sibling is on the receiving end of intimacy and favoritism by their father in mixed dyad families (e.g., possibly boys), leading the other sibling (e.g., possibly girls) to retaliate via relational aggression. Drawing on research examining parent differential treatment and family gender socialization, there is evidence that parents favor or demonstrate biases to the sibling of her/his own sex when families have both sons and daughters (McHale et al., 2003), and that girls tend to be more vulnerable to disfavored treatment than boys (McHale et al., 2000). Taken together, it is possible that for mixed-sex dyads in the current study, sons are being favored by their father, and their sisters, who are cognizant of such favored behavior, are engaging in relationally aggressive behaviors towards their brothers in retaliation. Extending this work, two potential mediating factors to explore between father-adolescent intimacy and sibling relational victimization is that of temporal parent involvement and adolescents' perceived fairness in treatment, which may directly link parent differential treatment to these associations.

Turning to father-adolescent conflict, several significant effects emerged. In this context, and in accordance with the study predictions, when father conflict was reported more than usual, more sibling relational victimization experiences were reported more

than usual. These findings are consistent with prior research which shows that conflict in father-adolescent subsystem may spill over into the sibling relationship, such that father-adolescent conflict is positively associated with sibling conflict (Kim et al., 2006). The findings for mixed-gender dyads, but not same-gender dyads, may also be explained by perceptions of unfair treatment by one's father due to same-sex bias towards sons (McHale et al., 2000), and possibly by daughters, ultimately contributing to more conflict in the father-daughter relationship and more sibling relational victimization reported by brothers. While the current study was unable to examine all four sibling dyad constellations due to sample size constraints, a fruitful next step would be to disentangle these associations with a larger sample size to evaluate whether there are differences among all four sibling dyad constellations (girl-girl, boy-boy, girl-boy, and boy-girl).

For same-gender dyads in this sample, a within-person finding suggests that when same-gender dyads report less father intimacy than usual, they also report more sibling relational victimization than usual. This finding is consistent with the prior research that more cohesion and emotional support predicts lower rates of sibling aggression (Jester et al., 2005; Yu & Gamble, 2008), and supports prior research that finds that that when fathers spent less time with siblings, relational aggression was more frequent using concurrent data from the same sample (Updegraff et al., 2005a). However, this finding also calls to attention the importance of father intimacy for same-sex dyads. Research suggests that when fathers are perceived as warmer towards younger sisters, sibling relational victimization is more pronounced (Updegraff et al., 2005a). One interpretation, although not tested due to sample size constraints, is that for girl-girl adolescent pairs, on occasions that older sisters perceive less intimacy with their father and more intimacy

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between their younger sister and father, that these older sisters retaliate using relational aggression towards their younger sisters. Among same-sex dyads consisting of two adolescent boys, who turn to their fathers for support more than adolescent girls (Steinberg and Silk, 2002), in the context of less father intimacy they do not ask their fathers for assistance or support with negative sibling interactions, such as sibling relational victimization. More generally, the father-adolescent relationship differs from that of the mother-adolescent relationship, such that father-adolescent relationships are described as more "playful" and "peer-like" and suggested to promote more egalitarian exchanges, when compared to mother-adolescent relationship (Parke & Buriel, 2007). Comparably, the sibling relationship has also been described as "peer-like" in nature (Dunn, 1993), and this commonality, as well as other shared qualities between these two relationships (Stocker & McHale, 1992), may explain the stronger link between father-adolescent relationships and sibling relationships in this study. Taken together, these findings suggest the importance of addressing the interrelatedness among family subsystems within family prevention and intervention programming, with an emphasis on how the father-adolescent relationship alongside sibling gender dynamics may have implications on broader sibling relationship dynamics.

In studying within-family dynamics, it is also important to acknowledge the role of genetics in the associations among family subsystems. For example, underlying genetic and personality traits may partially explain the family negativity among these two subsystems, such that specific temperaments or aggressive personality traits may be an underlying factor contributing to similar behaviors within different relationship subsystems (Chen & Deater-Deckard, 2015; Horwitz et al., 2011; South et al., 2008).

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Additionally, examining both the genetic and environmental variance in the associations between parent-adolescent conflict and intimacy and sibling relational victimization can isolate the variance attributed to sibling personality characteristics *and* parent-adolescent behavioral interactions that lend to these associations, as demonstrated in research examining parent-adolescent relationships, personality, and parenting (Chen & Deater-Deckard, 2015; Krueger et al., 2008; South et al., 2008). Notable research also shows that the connections between the parent-adolescent and sibling subsystems are largely explained by shared environmental components, suggesting that the general family climate can shape interactions across subsystems (Bussell et al., 1999; Neiderhiser et al., 2007). This prior work emphasizes the importance of examining parent-adolescent conflict and intimacy and sibling relational victimization from a genetic-environmental interplay perspective (Plomin, 1994).

Goal 3: Sibling Dynamics and Sibling Relational Victimization

The third goal of this study was to examine how sibling intimacy and conflict were associated with sibling relational victimization longitudinally. At the between-person level, siblings who reported less sibling intimacy, on average, also reported more sibling relational victimization, on average, across a three-year period. This finding is consistent with prior cross-sectional findings linking lower sibling intimacy and higher sibling relational victimization (Updegraff et al., 2005a). In the context of higher sibling relational victimization, it may be that adolescents do not perceive their sibling relationship as supportive and thus, intimacy and support may be less likely to occur. A within-person intimacy effect was also found for younger siblings only, such that when younger siblings reported less sibling intimacy compared to his/her cross-time average at

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each time point, younger siblings also reported more sibling relational victimization, further highlighting the vulnerability of younger siblings within the sibling dyad. While the findings of this study also show that older siblings report experiences of sibling relational victimization, younger siblings may have less practice, less exposure among peers, and less sophisticated cognitive skills than those that are needed to engage in relationally aggressive behaviors given their younger developmental age (Bjorkqvist et al., 1999). Younger siblings also look up to and admire older siblings more than the reverse (McHale et al., 2012), and may learn these behaviors and enact them in other contexts, such as friendships. For example, research suggests that having an older sibling may expose the younger sibling to negative behaviors, such as learned antisocial behavior (Synder, Bank, & Burraston, 2005). Guided by social learning theory (Bandura, 1977), one potential avenue for exploration is examining if and how younger siblings learn these relationally aggressive behaviors within the sibling relationship, and how they are then used towards their older siblings or among friends, and vice versa. One method to examine these research questions would be through the use of cross-lagged panel analysis to examine the bidirectional effects of relational aggression and victimization among siblings and friends across time (Selig & Little, 2012).

Turning to sibling conflict, and consistent with the predictions of this study, findings at both the between- and within-person levels suggest that more sibling conflict is associated with more sibling relational victimization. This finding suggests that while sibling conflict and relational aggression are distinct relationship constructs within the sibling relationship (Updegraff et al., 2005a), these two negative relationship qualities may co-occur and be used together to potentially control or manipulate in an attempt to

protect personal domains (i.e., prevent one's sibling from taking an item from their room) or possibly obtain new personal domains (i.e., securing a desired item from their sibling using manipulation tactics). In this study, sibling conflict is associated with the use of sibling relational victimization, however, the direction of these associations remain unknown.

Limitations

The findings of this study should be interpreted with both the strengths and limitations in mind. Several strengths of this study include the longitudinal design and the between- and within-person modeling approach, which allowed us to control for possible third variable effects such as response bias (Jacobs et al., 2002). This study also included data from two siblings in each family, which provided information to test moderation by birth order, sibling dyad constellation, and sibling gender.

Several limitations should also be noted. First, this sample was primarily European American working class, two-parent families residing in small town and rural area, which reflects the region in which the data were collected. For this reason, it is important that future work consider whether these associations exist in other family structures and demographic and ethnic/racial contexts. As one example, in cultural contexts where family support and interdependence is of great importance, such as Latinx families, these values may buffer against family negativity and conflict (Updegraff et al., 2005b). In addition, it will be important to expand this work to other family structures, including single-parent, divorced, and stepfamilies, as well as same-gender parent dyads. For example, there is some evidence that sibling conflict and aggression is higher in single-mother families and among full-siblings when compared to half- or stepsiblings,

which may contribute to higher levels of sibling relational victimization in these family contexts (Deater-Deckard et al., 2002). In addition, little research has examined the associations between the parent-adolescent and sibling relationship dynamics in families with same-gender parent dyads, leaving much unknown about the spillover of relationship qualities from the parent-adolescent relationship into sibling relationship within this family context. Given the same- and mixed-gender dyad moderation findings for father-adolescent relationships in the current study, which were interpreted using gender socialization perspectives (McHale et al., 2012), an important next step would be to examine these associations among families that include two female or two male parent figures to see if the associations differ across family contexts. Further, this study did not account for multigenerational households, where grandparents may serve as either a primary or additional parental figure. In these contexts, future research should examine how conflict and intimacy between youth and their grandparents may spill over into the sibling subsystem, providing new information about sibling relational victimization in the context of various family structures. Turning to the measures, this study was conducted before the vast influence of technology in the lives of adolescents, and thus, questions about conflict over technology or relational victimization via technological methods were not included. Thus, future research should examine how technology may be used to engage in conflict and relationally aggressive behaviors within the sibling dyad and its' associations with family dynamics.

Future Directions

Many future directions are implied from the findings of this study. This study highlights the associations between various family dynamics and sibling relational

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victimization, but with youth reporting only their own relational victimization, a next step would be to examine the associations between family dynamics and sibling relational aggression *and* victimization. As demonstrated in the peer literature, youth may be the target, perpetrator, or both the target and perpetrator of sibling relational aggression (Wang et al., 2009). Further examining both perpetration and victimization may shed light on family conditions in which these behaviors are most prevalent and detrimental to family dynamics and adolescent functioning, as well as inform family-based intervention and prevention programming designed to alter sibling relationships through changes in both parents' and siblings' behaviors, skills, and cognitions (McHale et al., 2012). Future research should also examine how youth differentiate sibling conflict and relationally aggressive behaviors and victimization, and under what conditions they use them separately and/or together to better understand the associations between these two forms of sibling negativity. One way to identify the use and associations of the aforementioned constructs is using a person-oriented approach and cluster analysis methods, which can identify profiles of youth who use or experience sibling conflict, relational aggression, and victimization (Bergman & Magnusson, 1997). Another potential avenue for future research is examining how relationally aggressive behaviors may be observed and experienced in the peer context, and how these behaviors may cross over into sibling context, lending to sibling relational victimization. While research currently reveals the crossover of relationally aggressive behaviors in early childhood (Ostrov, Crick, & Stauffacher, 2006; Stauffacher & DeHart, 2006), examining this transfer in adolescence is critical given the importance of interpersonal relationships during this time. Alternatively, exploring how genetics and other personality characteristics such as

temperament may lend to parent-adolescent conflict and the use of relationally aggressive

behaviors, as well as victimization, is a possible next step. It is possible that shared

genetics may explain negativity in both the parent-adolescent and sibling relationship,

contributing to the sibling relational victimization. Finally, a pattern analytic approach

(Magnusson, 1988) may identify distinct profiles of how family relationships are

patterned and identify contexts in which these associations are more or less pronounced.

Conclusion

This study provided new insights into sibling relational victimization, by charting

the developmental change of this form of victimization across adolescence and

identifying family dynamics associated with sibling relational victimization. The findings

of this study are in accordance with family systems theory (Cox & Paley, 1997; Fosco &

LoBraico, 2019; Minuchin, 1985), suggesting that parent-adolescent relationships, and

the often-overlooked sibling relationship, should not be studied in isolation and that

negativity from one subsystem (parent-adolescent) may spill over into another subsystem

(sibling). This study also shed light on the vulnerability of younger siblings as victims of

sibling relational aggression in the context of less sibling intimacy, which may have

implications on interpersonal relationship development during a developmentally

important time (Collins & Steinberg, 2006; Sullivan, 1953). Particularly noteworthy are

the findings examining the associations between father-adolescent intimacy and conflict

on sibling relational victimization, suggesting the importance of father-youth relationship

dynamics. Finally, the results of this study may be used to inform prevention and

intervention programming aimed at promoting healthy family dynamics by addressing

interlinked negativity across various family subsystems and its associations with sibling

relational victimization.

Paper #2: The Dark Side of Relationships: Parent-Adolescent Conflict and Sibling Negativity and Relational Victimization as Predictors of Friendships in Adolescence

The developmental period of adolescence is a critical time of change in youth's interpersonal relationships. Outside the home, friendship formation and the establishment of close, interpersonal relationships is a salient developmental task (Collins & Steinberg, 2006; Sullivan, 1953), while inside the home, many adolescents experience an increase in conflict with parents, often around issues of autonomy and authority (Shanahan et al., 2007b; Smetana, 2011). Substantial research finds associations between these two interpersonal contexts, which suggests the importance of parent-youth relationship dynamics for friendships during adolescence (Brown & Larson, 2009; Chung & Fuligni, 2011; De Goede et al., 2009; Shomaker & Furman, 2009). For example, higher levels of parent-youth conflict and parental psychological control are associated with lower quality friendships, higher levels of youth loneliness, and poorer conflict resolution and communication styles (Shomaker & Furman, 2009; Soenens et al., 2008; Van Doorn et al., 2011). Thus, parent-youth relationship dynamics are important to study as potential correlates of adolescents' friendships.

Yet, parent-youth relationships are only one subsystem among those that comprise families. From a family systems perspective, families are comprised of multiple, interrelated subsystems (Cox & Paley, 1997; Minuchin, 1985), and another potentially important subsystem for the development of friendships is the sibling relationship (McCoy et al., 1994; Updegraff et al., 2004). In contrast to parent-youth relationships, sibling relationships are more reciprocal in nature and often constitute youth's first 'peer-like' relationship (Dunn, 1993). Indeed, the sibling subsystem provides

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opportunities for youth to learn and practice relational skills that may be transferred to relationships with peers (Yucel et al., 2018). This study is grounded in a family systems perspective and expands research on the role of families in youth's peer relationships by considering mother-youth, father-youth, and sibling relationships, and the interactions among these subsystems, in predicting adolescents' friendship qualities (i.e., control, conflict, and perspective taking).

Parent-Adolescent Conflict and Friendship Dynamics

Parent-adolescent relationships undergo significant change in adolescence, including increases in conflict in early adolescence and declines in parental warmth from early to middle adolescence (Padilla et al., 2018; Shanahan et al., 2007a; Shanahan et al., 2007b; Skinner & McHale, 2016; Smetana et al., 2006). In comparisons of adolescents' relationships with mothers versus fathers, there is evidence that adolescents experience higher levels of conflict with mothers (Laursen et al., 1998; Shanahan et al., 2007b). Greater frequency of conflict with mothers may be attributed, in part, to adolescents spending more time and sharing more information with mothers than with fathers, providing more opportunities for conflicts to occur (Larson & Richards, 1994). Yet, father-youth relationships are understudied relative to mother-youth relationships (Cabrera et al., 2018), and should not be overlooked.

Beyond the home, negative interactions between parents and youth are associated with conflict engagement and relational aggression in youths' friendships (Soenes et al., 2008; Van Doorn et al., 2011). Examined from an attachment theory perspective, which posits that one's attachment to a parent/caregiver shapes a working model of interpersonal relationships (Bowlby, 1969; Bretherton & Munholland, 2008), research

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suggests that greater frequency of negative interactions between adolescents and their mothers is associated with more conflict behaviors and poorer communication skills during discussions with close friends (Shomaker & Furman, 2009). Researchers postulate that parents/caregivers serve as a secure base, and that insecurity in this relationship may have a negative impact on adolescents' other interpersonal relationships (Shomaker & Furman, 2009). Additional research guided by both attachment and social learning perspectives (Bandura, 1977; Bowlby, 1969) finds that poor conflict resolution styles spill over from mother- and father-youth relationships to friendships (Van Doorn et al., 2011). Finally, longitudinal research guided by the two aforementioned perspectives suggests that mothers' and fathers' hostile behaviors towards their adolescents (i.e., angry coercion) is significantly associated with adolescents' hostile behaviors toward their friends (Cui et al., 2002). In sum, these results provide support for associations between negative and conflictual dynamics in mother-adolescent and father-adolescent relationships and friendships during adolescence, primarily among European American families.

Sibling Relationships and Friendships

The associations between sibling relationships and peer dynamics are understudied, yet siblings are daily companions and important socializing agents throughout childhood and adolescence (McHale et al., 2012). Often grounded in social learning theory, research examining negative sibling interactions, such as sibling conflict, suggests that this context provides the space to learn and practice conflictual and aggressive behaviors (Bandura, 1977; Bank et al., 2004; Buist et al., 2011; Criss & Shaw, 2005). More specifically, according to social interaction theory, the sibling relationship

can provide a training ground for *physically* aggressive and coercive behaviors, which may extend to other interpersonal relationships, including those with peers and friends (Bank et al., 2004; Patterson et al., 1984; Stormshak et al., 1996). For example, negative interaction styles learned through conflictual and antagonizing exchanges with siblings are associated with youth's involvement with deviant peers (Bank et al., 2004; Criss & Shaw, 2005; Kim et al., 1999). These findings suggest a pattern of spillover of negative interaction styles with siblings to those with peers.

Building on Patterson's (1984) social interactional theory, research suggests that the sibling relationships may also serve as a training ground for *relationally* aggressive behaviors and result in sibling relational victimization, two dimensions of the sibling relationship that have received relatively less attention compared to other aspects of the sibling relationship in adolescence (Campione-Barr et al., 2014; Gallagher et al., 2018; Updegraff et al., 2005a; Yu & Gamble, 2008). Relational victimization includes experiences in which harm is intended towards the target victim through behaviors such as damaging one's close relationships through manipulation, exclusion, withdrawing support and/or acceptance, and spreading rumors and/or gossip about an individual to elicit rejection (Crick, 1995; Crick & Grotpeter, 1995). From a developmental perspective, examining sibling relational victimization in adolescence is important. Youth in adolescence, as compared to childhood, hold cognitive abilities and skills that allow for the more sophisticated use of sibling relational victimization (Casas & Bower, 2018). Further, much of what is known about the construct of relational victimization comes from research on children's peer relationships (Crick & Grotpeter, 1995; Murray-Close et al., 2007), and thus, we know little about the implications of sibling relational

victimization on friendships. From the limited research on sibling relational victimization in adolescence, there is evidence that being the target of sibling relational victimization is associated with less romantic competence for older siblings, and more risk behavior engagement for younger siblings (Gallagher et al., 2018), which again suggests the spillover of sibling relational victimization into other interpersonal contexts during this developmental period. Given the demonstrated use of relational aggression among peers, and aforementioned associations with romantic competence, the next step is to explore how sibling relational victimization may be related to friend dynamics in adolescence.

In studying the links between sibling relationships and friendships, it is important to account for variation by youth and dyad characteristics. Consistent social learning theory tenants, older siblings, who are chronologically and developmentally more mature and of "higher status" in the dyad, are more likely to serve as a role model or teacher to their younger siblings than vice versa (Bandura, 1977; Defoe et al., 2013; McHale et al., 2001; Tucker et al., 1999). Research often links older and younger siblings' engagement in delinquent activities, for example, and finds that older siblings' delinquent behaviors predict the later expression of their younger siblings' delinquent behaviors (Ardelt & Day, 2002; Slomkowski et al., 2001), but rarely examines the reverse association (i.e., younger siblings serving as role models to their older siblings). It is possible that sibling relationship qualities may be more strongly associated with friendships for younger siblings relative to older siblings, as younger siblings may have less experience and social skills in the peer context because they are younger, and thus, they may be more likely to draw on learned and practiced sibling behaviors with friends (Brown & Larson, 2009; Smetana et al., 2006). Adolescent *gender* is another factor associated with variability in

sibling relationship dynamics, friendships, and their potential associations (Flook, 2011; Kim et al., 2007; Rudolph, 2002; Telzer & Fuligni, 2013). More specifically, females report more distress due interpersonal conflicts and stressors as compared to males in adolescence (Flook, 2011; Telzer & Fuligni, 2013), which may mean that negative sibling relationship qualities (i.e., sibling relational victimization, sibling negativity) may be more strongly linked to friendships for female than male youth. Thus, when examining the spillover of negative sibling relationship qualities into the peer context, it is important to test whether these associations differ by youth gender.

Interrelated Family Subsystems

Family systems theory posits that family subsystems, such as the parent-adolescent and sibling subsystems, are interrelated and as a result, conflict or negativity in one subsystem has implications for other family subsystems (Cox & Paley, 1997; Fosco & LoBraico, 2019). In line with this theory, research suggests positive associations between parent-adolescent and sibling negativity (Criss & Shaw, 2005; Kim et al., 2006; McHale et al., 2000). Further, the sibling relationship and its' respective dynamics (i.e., whether or not siblings get along with one another, share resources, etc.) also serves as a source of parent-adolescent disagreement (Feinberg et al., 2012; McHale & Crouter, 1996), highlighting the interdependencies among these family subsystems. Particularly applicable to the current study, several studies have documented a link between parent-adolescent relationship dynamics and sibling relational victimization (Campione-Barr et al., 2014; Updegraff et al., 2005a; Yu & Gamble, 2008). For example, Campione-Barr and colleagues (2014) report that sibling relational victimization mediates the link between maternal psychological control and adolescent adjustment problems. Together,

these studies highlight the interdependence among these subsystems (Fosco & LoBraico, 2019; Minuchin, 1985), and the implications of a disruption (i.e., conflict, psychological control) in one subsystem for another subsystem.

Given the substantiated links between parent-youth and sibling relationships and the tenets of family systems theory (Cox & Paley, 1997; Fosco & LoBraico, 2019; Minuchin, 1985), this study examined the interactions between mother-youth and father-youth conflict and sibling relationship negativity and relational victimization in predicting friendship qualities. It was predicted that parent-youth conflict and negative sibling interactions (i.e., sibling negativity and sibling relational victimization) would have an additive effect, such that when youth experience high levels of both parent-youth conflict and sibling negativity, or parent-youth conflict and sibling relational victimization, they would report more negative friendships (i.e., more conflict and control, less perspective taking) as compared to youth who experience either high parent-youth conflict or high sibling negativity/relational victimization. Differences as a function of youth gender (male vs. female) and sibling birth order (older vs. younger sibling) were explored, as disentangling these associations provides a clearer understanding of interpersonal conflict, negativity, and potential vulnerability within these family subsystems in relation to adolescent friendships dynamics.

Adolescent Friendships

Time spent with friends becomes increasingly important for youth in adolescence (Collins & Steinberg, 2006), and the quality of these friendships are associated with adolescents' psychosocial development (i.e., anxiety, depression, aggression, delinquency; Andrews et al., 2018; La Greca & Harrison, 2005; Levey et al., 2019;

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Steinberg & Morris, 2001). Given the developmental importance of friendships in

adolescence, this study examined how parent-adolescent conflict and sibling negativity

and relational victimization predict similar qualities in one's same-gender friendship,

including conflict and control. From a social learning perspective (Bandura, 1977), youth

may learn and practice conflictual and controlling behaviors that are deemed acceptable

with parents and siblings in the home, which serves as a safe space to practice negative

behaviors as family membership is not voluntary. However, when generalized to the

friendship context, these behaviors may lead to friendship termination, as controlling,

manipulative, and conflictual behaviors are problematic features in voluntary

relationships, like friendships (Poulin, & Chan, 2010). Research supports this notion,

such that higher levels of conflict in one's friendship are linked to higher levels of

negative affect (i.e., anger, hostility, confusion, tension, and anxiety) and lower

friendship stability (Bukowski et al., 1994; Vannucci et al., 2018). Thus, it was predicted

that the combination of higher levels of parent-youth conflict *and* sibling

negativity/relational victimization would be associated with higher levels of friendship

conflict and control, relative to youth who only experience high conflict/negativity within

one family relationship. Further, it was predicted that the associations between family and

friendship conflict would be stronger for females, who report more distress in the context

of interpersonal conflicts and stressors that may be more detrimental to their friendships

(Flook, 2011; Telzer & Fuligni, 2013). For friendship control, the associations were

expected to be stronger for males, who may learn and practice control tactics through

their own experience of relational victimization in their sibling relationship and in the

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context of parent-youth conflict, that may then extend to their friendships (Updegraff et al., 2002b).

In addition to examining friendship control and conflict as outcomes, this study also examined the links between mother- and father-adolescent conflict and sibling negativity/relational victimization on perspective taking in the friendship. Drawing on literature examining conflict resolution styles, as one must engage in perspective taking during conflict resolution, research finds that conflict resolution styles spillover from mother-youth and father-youth relationships to friendships for adolescent youth (Van Doorn et al., 2011). Further, in the context of experiencing high sibling relational victimization, perspective-taking skills needed for effective problem solving may be used less often given the potential to also learn and practice such aggressive behaviors, as the behavioral manifestations of sibling relational aggression have a self-oriented focus, rather than collaborative problem-solving focus. Given the importance of successful conflict resolution strategies on friendships during adolescence (Bowker, 2004; Poulin & Chan, 2010), and the need for perspective taking in resolving conflicts, it is important to examine whether the interaction between mother-youth and father-youth conflict and sibling negativity/relational victimization predict lower perspective taking in adolescents' friendships.

The Current Study

The study had two goals. The first goal was to examine the interactions between mother-adolescent and father-adolescent conflict and both sibling negativity and sibling relational victimization on adolescents' ratings of their friendships with a same-sex best friend. Specifically, I examined whether sibling negativity and relational victimization

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moderated the associations between parent-adolescent conflict and friendship control, conflict, and perspective taking. It was predicted that the additive effects of higher levels of parent-youth conflict and sibling negativity and higher levels of parent-youth conflict and sibling relational victimization would be associated with higher levels of friendship conflict and control, and lower levels of perspective taking in adolescent friendships.

As a second goal, I tested whether sibling birth order (older vs. younger sibling) and gender (male vs. female) moderated these associations. It was predicted that these associations would be stronger for younger siblings, who may experience conflict and negative behaviors from multiple family members of higher status (e.g., mother, father, and older sibling), and thus, be more likely to learn these behaviors from influential family members and generalize to their friendships (Bandura, 1977; McHale et al., 2012). In addition, the associations between mother/father-youth conflict and sibling negativity/relational victimization and friendship *conflict* were expected to be stronger for females than males, as females report more distress in the context of interpersonal conflicts and stressors that may be more detrimental to their friendships (Flook, 2011; Telzer & Fuligni, 2013). Finally, the associations to friendship *control* were expected to be stronger for males, who may learn and practice control tactics through relationally aggressive behaviors in their sibling relationship, that may then extend to their friendships. Although no differences in sibling relational victimization by gender has been found, this prediction was supported by findings that adolescent boys are more controlling of best friends as compared to girls (Updegraff et al., 2002b). Although explored, there were no birth order or sibling gender moderation predictions for friendship perspective taking.

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Materials and Methods

Participants

Data were collected from mothers, fathers, and older and younger siblings as part of a longitudinal study (The Penn State Family Relationships Project – Adolescent Study) examining the connections between parents' work experiences, family relationships, and adolescent development (Crouter et al., 2001; McHale et al., 2000). Families were recruited through letters describing the study that were sent to the homes of families in 13 school districts in a northeastern state. Interested parents were asked to return a postcard to express their interest. Families who were eligible to participate included nondivorced couples with a firstborn in 8th, 9th, or 10th grade at the start of study and a secondborn who was one to three years younger. Given the larger study goals to assess parents' work experiences and adolescent development, all fathers in the study were employed full time and all but one mother was employed at least half time. Of the eligible families, 95% participated in the study. The current study used data from the second and third annual interviews in which the measures of interest for the present study were collected, which will be labeled T1 and T2 hereafter.

A total of 194 older and younger siblings were included in the study. On average, older siblings were 15.96 years of age ($SD = 0.72$) at T1, and 16.97 years of age ($SD = 0.72$) at T2. Younger siblings averaged 13.49 years of age ($SD = 1.02$) at T1, and 14.49 years of age ($SD = 1.02$) T2. The average age spacing between the firstborns and secondborns was 2.47 years ($SD = 0.94$), and of these youth, 186 were female and 202 were male. All families in this study were Caucasian, with the exception of four mixed race families, and from working- and middle-class backgrounds. At T1, mothers' average

years of education was 14.42 years ($SD = 2.10$) and fathers' average years of education

was 14.26 years ($SD = 2.35$). The average annual income was $21,765 ($SD = $14,307$)

for mothers and $40,617 ($SD = $22,789$) for fathers at T1. Parents reported that they had

been married an average of 18.61 years ($SD = 3.22$) and more than half of the

participating families (56%) had two children, 33% had three children, and the rest of the

families had four or more children. The average family size was 4.59 people ($SD = 0.80$).

Procedure

Data were collected during home visits over the course of two years. Informed

consent was collected from all participants at the onset of the study, and families were

paid a $100 honorarium for their participation at each timepoint. Each year, interviews

lasting about two to three hours were conducted separately with adolescents and parents.

In these interviews, parents provided background information and each family member

responded to questions about their family relationships. Older and younger siblings were

also asked to report about their friendships with their same-sex best friend, who was not

an immediate family member and who lived in the area. If either sibling reported that

they had more than one same-sex best friend, youth were instructed to choose the best

friend that they have known the longest. Throughout the longitudinal study, youth were

asked to indicate whether or not the person they previously identified as their best friend

was still their best friend. At T2, 81% of older siblings and 82% of younger siblings

reported on the same best friend as they did at T1.

Measures

For all study measures, higher scores indicated higher levels of the targeted

construct. Cronbach alphas were examined at all time points for both siblings.

Parent-Adolescent Conflict (T1)

To measure parent-adolescent conflict, adolescent siblings and their mothers and fathers completed a 12-item measure of frequency of conflict in the parent-youth relationship (Harris, 1992; Smetana, 1988). All participants were asked to rate how often they have conflicts with each parent or adolescent on a six-point scale (1 = *not at all,* 6= *several times a day*) to indicate the frequency of each conflict event (e.g., "choosing friends, when to see friends, or kinds of activities you do with friends"). For mothers' reports of conflict with younger and older siblings, Cronbach's alphas were .85 and .81, respectively. For fathers' reports, Cronbach's alphas were .82 for younger siblings, and .85 for older siblings. For adolescent reported mother-adolescent conflict, the Cronbach's alphas were .82 for younger siblings, and .79 for older siblings. For adolescent reported father-adolescent conflict, the Cronbach's alphas were .86 for younger siblings, and .83 for older siblings.

Sibling Negativity and Relational Victimization (T1)

Older and younger siblings completed a five-item scale to assess negativity with their sibling in the past year (Stocker & McHale, 2002). Items were rated on a 5-point Likert scale (1 = *not at all;* 5 = *very much*) to indicate the frequency of each event (e.g., "how often do you start fights or cause trouble for your brother/sister"). Items assessed conflict, physical aggression, and antagonism in one's sibling relationship, and were summed to create a measure of the overall frequency of sibling negativity with one's sibling. Cronbach's alphas were .81 for younger siblings and .75 for older siblings at T1.

Older and younger siblings completed a six-item scale to assess their perceptions of being the *target or victim target* of relationally aggressive behaviors by their sibling in the past year (Gallagher et al., 2018; O'Brien & Crick, 1995; Updegraff et al., 2005a). Items were rated on a 5-point Likert scale (1 = *never;* 5 = *very often*) to indicate the frequency of each event (e.g., "he/she leaves me out of things when he/she is mad at me"). Items were summed to create a measure of the overall frequency of relational victimization from one's sibling. Cronbach's alphas were .83 for younger siblings and .75 for older siblings at T1.

Friendship Qualities (T1; T2)

Older and younger siblings completed a 10-item scale to assess power and control dynamics in their friendship with their same-sex best friend using a measure adapted from Stets (1995). Items were rated on a 5-point Likert scale (1 = *not at all*; 5 = *very much*) to indicate the frequency of each event (e.g., "I keep him/her from doing things I don't like"). Items were summed to create a measure of the overall frequency of friendship control. For younger siblings, Cronbach's alphas were .80 at T1 and .76 at T2. For older siblings, Cronbach's alphas were .81 at T1 and .80 at T2.

Older and younger siblings completed a four-item scale to assess conflict with their same-sex best friend using an adapted measure of friend conflict from Stocker and McHale's (1992) sibling relationship inventory. Items were rated on a 5-point Likert scale (1 = *not at all;* 5 = *very much*) to indicate the frequency of each event (e.g., "how often do you start fights or cause trouble for him/her"). Items were summed to create a measure of the overall frequency of friendship conflict. For younger siblings, Cronbach's

alphas were .69 at T1 and .65 at T2. For older siblings, Cronbach's alphas were .66 at T1 and .62 at T2.

Older and younger siblings completed a four-item scale to assess perspective taking with their same-sex best friend using a measure from Stets (1995). Items were rated on a 5-point Likert scale (1 = *never;* 5 = *very often*) to indicate the frequency of each event (e.g., "I have difficulty seeing (HIS/HER) viewpoint in an argument"). Items were summed to create a measure of the overall frequency of perspective taking in one's own friendship. Items were then reversed scored and lower scores indicate less perspective taking. For younger siblings, Cronbach's alphas were .84 at T1 and .89 at T2. For older siblings, Cronbach's alphas were .89 at T1 and .90 at T2.

Moderators and Covariates

Two sibling/dyad characteristics were included to test for moderation: (a) sibling gender (0 = *female*; 1 = *male*), and (b) birth order (0 = *older*; 1 = *younger*). Covariates included sibling age spacing (i.e., older siblings' age in years minus younger siblings'), family size, and family socioeconomic status (the sum of mother income, father income, and the average of the additional sources of reported income). Best friend stability (whether or not the adolescent reported on the same best friend at T1and T2) and prior levels of the friendship variables from T1 are also included as additional covariates.

Analytic Plan

Preliminary Analyses

First, the means and standard deviations of the variables were examined for assumptions of normality. To account for siblings nested within families and the non-independence of the data in M*plus 7.4*, the model specification "type=complex" and a

cluster variable for family were specified in all models (Muthén & Muthén, 2015).

These specifications adjust standard errors and the chi-square test of model fit by taking

into account the non-independence of the data and cluster sampling (Muthen & Muthen,

1998-2017). A robust estimator (MLR) was used to adjust for nonnormality of the data

and missing data points, which ranged from 2% to 3% across all study variables.

Path Analytic Models

To examine the proposed research question, path analytic models were tested in

M*plus 7.4* (Muthén & Muthén, 2015) to examine whether sibling relational

victimization and sibling negativity at T1 moderates the associaton between parent-

adolescent conflict (T1) and friendship control, conflict, and perspective taking (T2) in

friendships (see Figure 2), controlling for T1 friendship qualities and family and sibling

characteristics. To begin, product terms were created to assess moderation of sibling

relational victimization and sibling conflict. These product terms represented the

interaction effects between parent-adolescent conflict by reporter (mother, father, or

adolescent) and the moderators of interest: (a) sibling relational victimization, and (b)

sibling negativity (Kline, 2011, p. 327). In all path models, the direct effect of parent-

adolescent conflict and the interaction terms (exogenous variables) at T1 were tested on

friendship control, conflict, and perspective taking (endogenous varaibles) at T2, while

controlling for prior levels of the friendship variables at T1. To examine for reporter

differences in the associations between the variables of interest, given the documented

dicrepanices between parent and youth self-reports of relationship qualities (Ehrlich et

al., 2016; Laursen & Collins, 2009), four parallel models were initially examined by the

reporter of parent-adolescent conflict on the outcomes of interest. First models were

examined for *mother*-reported adolescent conflict, followed by a separate model to

assess *father*-reported adolescent conflict. Next, *adolescent*-reported conflict with their

mother was examined, followed by *adolescent*-reported conflict with their father,

separately. Next, all reporters were added to the same model for model parsominy and

to account for all family reports of parent-adolescent conflict and associations were re-

examined for changes. Model covariates include birth order, sibling gender,

socioeconomic status, family size, same-sex best friend stability, and sibling age-spacing. Follow-up analyses for significant interactions included plotting the interaction and probing the interaction to see if the simple slopes were significantly different from zero.

Multiple-Group Models

Group Moderation of Overall Model. To examine moderation by sibling birth order (older vs. younger sibling) and sibling gender (male vs. female) on global model fit using the previously described associations, two sets of multiple-group path models were tested separately in M*plus 7.4* (Muthén & Muthén, 2015). Starting with sibling birth order, regression coefficients for all paths were freely estimated for both older and younger siblings. Next, the regression coefficients were constrained to be equal across the two groups and model fit was reexamined. If the comparison of the freely estimated and constrained models suggested no significant decrease in overall model fit, then the path analytic model was an acceptable overall model for both groups, suggesting no moderation by group membership. However, if there was a significant decrease in model fit, then the constrained path analytic model suggested group membership differences, and each path of interest was tested separately. Following this test, the same steps were repeated to test for sibling gender moderation.

Moderation of Model Paths. While the prior tests examined moderation on global model fit using cross-group constraints, the next tests of moderation examined potential group differences with respect to individual model paths. To examine moderation by sibling birth order (older vs. younger sibling) and sibling gender (male vs. female) on the model paths using the previously described associations, constraints were tested on each path in M*plus 7.4* (Muthén & Muthén, 2015). Using in the model specification DIFFTEST, single degree of freedom chi-square difference tests were

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used to evaluate group differences on each path. Moderation by sibling birth order on each path was examined first, followed by moderation of sibling gender, separately. Follow-up analyses for significant interactions included plotting the interaction, and probing the interaction to see if the simple slopes were significantly different from zero.

Goodness of Fit Criteria

Goodness of fit for the path analytic models were evaluated by examining the chi-square significance test, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Previous literature suggests that model criteria consisting of a nonsignificant chi-square test, a CFI > .95, a RMSEA ≤ .08, and a SRMR ≤ .08 indicates acceptable model fit (Hu & Bentler, 1999). Accordingly, model fit analysis for all models was based on these model fit criteria. To evaluate the effect of the imposed constraints when testing for moderation by sibling birth order and gender, a Satorra-Bentler (2001) scaled chi-square difference test was conducted after constraining all or one path(s) to be equal between groups. A nonsignificant chi-square difference test would suggest no evidence of difference by group membership.

Results

Preliminary Analyses

Table 6 shows the means, standard deviations, and bivariate correlations among the study variables. Fathers', mothers', and adolescents' reports of parent-adolescent conflict fell below the midpoint (i.e., below 42, range from 12 to 72) on the summed scale score, indicating relatively low levels of parent-adolescent conflict in this sample. Older and younger siblings' reports of relational victimization fell below the midpoint

(i.e., below 18, range from 6 to 30) on the summed scale score, indicating relatively low levels of sibling relational victimization in this sample. Older and younger siblings' reports of sibling negativity fell below the midpoint (i.e., below 15, range from 5 to 25), indicating relatively low levels of sibling negativity in this sample.

Turning to the friendship variables of interest, older and younger siblings' reports of friendship control at both time points fell below the midpoint (i.e., below 30, range from 10 to 50), indicating relatively low levels of friendship control in this sample. Older and younger siblings' reports of friendship conflict fell below the midpoint (i.e., below 12, range from 4 to 20), indicating relatively low levels of friendship conflict in this sample. Lastly, older and younger siblings' reports of friendship perspective taking was above the midpoint (i.e., above 12, range from 4 to 20), indicating moderately high levels of friendship perspective taking in this sample. Moving to the correlations, the majority of correlations were significant and in the expected directions (i.e., more parent-adolescent conflict is associated with more sibling relational victimization and sibling negativity; more sibling relational victimization and negativity is associated with more friendship conflict and less friendship perspective taking).

Path Analytic Models

To examine the associations of interest and to account for reporter differences of parent-adolescent conflict, four parallel models were examined by the reporter of parent-adolescent conflict separately, such that models were examined first for mother-reported adolescent conflict, second for father-reported adolescent conflict, and then third for adolescent-reported conflict with each parent, separately. When examined separately by reporter of parent-adolescent conflict, model fit indices did not converge

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due to model saturation. However, significance of paths were examined for each model. Next, measures from all reporters were added to the same model for parsimony and the model fit and paths were examined for significance. The combination of all reporters into one model did not change the overall pattern of significance among the paths. Thus, all reporters were retained in the model. Moving forward, several non-significant covariates (sibling age spacing, family size, and family SES) were removed from the model with the exception of friendship closeness, which controls for whether or not the adolescent reports on the same friend at both T1 and T2. The final model (see Table 7) with mothers', fathers', and older and younger siblings' reports of parent-adolescent conflict and model covariates of sibling gender, birth order, friendship closeness, and all prior levels of the outcome variables from T1 suggested excellent model fit, $\chi^2(6) =$ 9.70, $p = .14$, RMSEA $= .04$, CFI $= .99$, and SRMR $= .02$.

Examination of the model results show that prior levels of all outcome variables are stable and significant from T1 to T2. Sibling gender is a significant covariate for friendship conflict ($b = .41$, $p < .05$) and friendship perspective taking ($b = -1.77$, $p <$ .05), suggesting that males report more friendship conflict and less perspective taking when compared to females. No main effects were found; however, there were two significant two-way interactions. First, there was a significant adolescent reported mother-adolescent conflict by sibling negativity interaction on friendship conflict, ($b = -$ 0.009, $p < .05$). Simple slope follow-up analyses revealed that more mother-adolescent conflict in combination with more sibling negativity was associated with *less* friendship conflict ($b = -0.04$, $p < .05$; see Figure 3), while the simple slope for more less sibling negativity was not significantly different from zero ($b = 0.02$, $p = .21$). Next, a mother-

reported mother-adolescent conflict by sibling negativity interaction on friendship perspective taking was found (b = -0.012, p = .05); however, simple slope analyses revealed that the slopes were in different directions, but neither was significantly different from zero (high sibling negativity: b = -.05, p = .152; low sibling negativity: b = .05, p = .162).

Multiple-Group Models

Group Moderation of Overall Model

   Birth Order. To examine moderation by birth order (older vs. younger siblings), the path analytic model with all reporters and the covariates of sibling gender, birth order, friendship closeness, and prior levels of the outcome variables were used. First, all regression coefficients were allowed to freely estimate for both groups. This model suggested acceptable model fit (see Table 8, Model 1). Next, all regression coefficients were constrained to be equal across both groups (see Table 8, Model 2). A Satorra-Bentler (2001) scaled chi-square difference test did not suggest a statistically significant decrease in model fit when comparing the freely estimated path model (Model 1) and the nested constrained path model (Model 2), $\Delta\chi^2(51) = 64.99$, $p = .09$. This non-significant p-value suggests that there is no moderation by sibling birth order for the overall model.

   Sibling Gender. To examine moderation by sibling gender (females vs. males), the path analytic model with all reporters and the covariates of of sibling gender, birth order, friendship closeness, and prior levels of the outcome variables were used. First, all regression coefficients were allowed to freely estimate for both groups. This model suggested excellent model fit (see Table 9, Model 1). Next, all regression coefficients

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were constrained to be equal across both groups (see Table 9, Model 2). A Satorra-Bentler (2001) scaled chi-square difference test did not suggest a statistically significant decrease in model fit when comparing the freely estimated path model (Model 1) and the nested constrained path model (Model 2), $\Delta\chi^2(51) = 54.59$, $p = .34$. This non-significant p-value suggests that there is no moderation by sibling gender for the overall model.

Moderation of Model Paths

Birth Order. While the prior tests did not find birth order moderation on *global model fit* using cross-group constraints, the next tests of moderation examined potential group differences with respect to individual model paths. Starting with the outcome of friendship control, one two-way interaction emerged: the main effect of sibling negativity was moderated by birth order ($b = 0.25$, $p < .05$). For younger siblings ($b = -0.13$, $p = .10$), higher sibling negativity was associated with lower friendship control. However, for older siblings ($b = 0.12$, $p = .11$), higher sibling negativity was associated with *higher* friendship control. Turning to the outcome of friendship perspective taking, the results revealed another two-way interaction: birth order moderation of the main effect of sibling relational victimization on friendship perspective taking ($b = .17$, $p < .05$). Lower relational victimization was associated with higher friendship perspective taking for younger siblings ($b = -0.08$, $p < .05$), but not for older siblings ($b = 0.08$, $p = .19$). Finally, the covariate of friendship closeness on friendship perspective taking was also moderated by birth order ($b = 1.75$, $p < .001$), such that for older siblings ($b = 1.24$, $p < .05$), but not for younger siblings ($b = -0.52$, $p = .15$), higher best friend stability was associated with higher friendship perspective taking.

Two moderated three-way interactions were revealed for friendship perspective taking. First, a mother reported mother-adolescent conflict by sibling negativity interaction on friendship perspective taking was found to be significantly different between the two groups (b = -0.02, p <.05). However, simple slope analyses revealed that the slopes differed in directions for high versus low negativity for older and younger siblings, but none of the slopes were significantly different from zero for older siblings (high sibling negativity: b = -0.09, p = .07; low sibling negativity: b = 0.05, p = .31) or for younger siblings (high sibling negativity: b = -0.01, p = .80; low sibling negativity: b = 0.04, p = .31). Next, a *father* reported father-adolescent conflict by sibling negativity interaction on friendship perspective taking was also revealed (b = 0.03, p < .05). However, simple slope analyses also revealed that the simple slopes were not significantly different from zero for older siblings (high sibling negativity: b = 0.02, p = .62; low sibling negativity: b = 0.04, p = .37) or for younger siblings (high sibling negativity: b = 0.02, p = .60; low sibling negativity: b = 0.04, p = .32).

Sibling Gender. The prior multiple group tests did not find moderation by sibling gender on *global model fit* using cross-group constraints, however, the next tests of moderation examined potential group differences with respect to individual model paths. Starting with the outcome of friendship control, two three-way interactions were revealed. First, adolescent reported father-adolescent conflict by relational victimization interaction on friendship control was found to be significantly different between males and females (b = -0.05, p < .05); however, simple slope analyses revealed that the simple slopes were not significantly different from zero for females (high relational victimization: b = -0.05, p = .41; low relational victimization: b = 0.01, p = .83) or for

males (high relational victimization: $b = -0.00$, $p = .99$; low relational victimization: $b = -0.07$, $p = .21$). Next, mother reported mother-adolescent conflict by relational victimization interaction on friendship control was found to be significantly different for males versus females ($b = 0.04$, $p < .05$). Simple slope follow-up analyses revealed that for females, more mother-adolescent conflict in combination with more relational victimization was associated with more friendship control ($b = 0.09$, $p < .05$; see Figure 4), while the simple slope for less relational victimization was not significantly different from zero for females ($b = -0.06$, $p = .26$). For males, simple slopes were not significantly different from zero (high relational victimization: $b = -0.06$, $p = .51$; low relational victimization: $b = -0.03$, $p = .63$).

Turning to the outcome of friendship perspective taking, one two-way interaction emerged: the main effect of sibling negativity was moderated by gender ($\beta = -0.20$, $p < .05$). For females ($\beta = -.14$, $p < .05$), but not for males ($\beta = .06$, $p = .37$), less sibling negativity was associated with more friendship perspective taking. Next, two three-way interactions emerged. First, father reported father-adolescent conflict by relational victimization interaction on friendship perspective taking was found to be significantly different by gender ($b = -0.02$, $p < .05$); however, simple slope analyses revealed that the simple slopes were not significantly different from zero for females (high relational victimization: $b = 0.03$, $p = .43$; low relational victimization: $b = 0.05$, $p = .41$) or for males (high relational victimization: $b = -0.03$, $p = .33$; low relational victimization: $b = 0.03$, $p = .61$). Further, adolescent reported mother-adolescent conflict by relational victimization interaction on friendship perspective taking was found to be significantly different by gender ($b = 0.03$, $p < .05$). Simple slope follow-up

analyses revealed that for females, more mother-adolescent conflict in combination with less relational victimization was associated with less friendship perspective taking ($b = -0.11$, $p < .05$; see Figure 5), while the simple slope for more relational victimization was not significantly different from zero ($b = 0.00$, $p = .98$). For males, simple slopes were not significantly different from zero (high relational victimization: $b = -0.03$, $p = .42$; low relational victimization: $b = -0.00$, $p = .95$).

Discussion

Research on family relationships during adolescence often focuses on parent-youth relationships, documenting increases in day-to-day parent-youth conflicts (Smetana, 2011; Steinberg & Silk, 2002). Yet, from a family systems perspective, where families are comprised of multiple interrelated subsystems (Cox & Paley, 1997; Minuchin, 1985), sibling relationships and their associated qualities also play an important role in friendship dynamics during this developmental period (Updegraff et al., 2002b; Yucel et al., 2018) Toward this end, this study explored the role of family, including mother-youth, father-youth, and sibling relationships, and the associated interactions among these relationships, in predicting adolescent friendship qualities (i.e., control, conflict, and perspective taking). Findings suggest that both parent-youth and sibling relationship dynamics are linked to friendship qualities, albeit in different ways for younger and older siblings, and male and female adolescents. Further, these findings highlight contexts in which sibling relational victimization, an understudied sibling relationship dimension, is most prevalent, as well as the spill-over of negativity in family relationships to friendships during an important time of interpersonal relationship development (Collins & Steinberg, 2006; Sullivan, 1953).

Goal 1: Associations between negative family and friendship dynamics

The first goal of this study was to examine the associations between parent-youth and sibling relationships on friendship qualities, specifically testing how sibling negativity and relational victimization moderate the associations between parent-adolescent conflict and friendship control, conflict, and perspective taking in adolescence. Although no main effects were significant, an unexpected interaction suggests that high levels of mother-adolescent conflict in combination with high sibling negativity towards one's sibling was associated with *less* friendship conflict, rather than more friendship conflict as predicted. It is possible that youth who are reporting high levels of conflict with mothers and negativity with siblings may not engage in such conflict with friends, as friendships are voluntary and such behaviors may lead to friendship instability and termination (Poulin & Chan, 2010). These youth may also actively seek out and maintain friendships in which they find compatible and anticipate low levels of friendship conflict, consistent with "niche picking" (Scarr & McCartney, 1983). Also inconsistent with predictions, sibling relational victimization was not found to moderate the associations between mother-adolescent conflict and friendship conflict. However, sibling relational victimization consists of a different set of behaviors from conflictual behaviors in which one's goal is to inflict harm on one's sibling by damaging their close relationships through manipulation or exclusion (Crick, 1995; Crick & Grotpeter, 1995). The goals and behaviors consistent across mother-adolescent conflict, sibling negativity, and friendship conflict are not consistent with the goals and behaviors of sibling relational victimization, which may explain the lack of association between these variables.

Mother-adolescent conflict in combination sibling negativity was the only significant interaction predicting friendship *conflict* in this sample. This study also found no evidence of associations between the *father*-adolescent relationship, sibling relationship, and the friendship outcomes of interest. Taking into account family roles within European American families, mothers engage in a family managerial role and are more involved in and knowledgeable about their adolescent's peer relationships and peer-oriented activities when compared to fathers, and in-turn, may act as gate keepers to access to problematic and conflictual peer relationships (Parke & Buriel, 2007; Updegraff et al., 2001). Also, given documented differences in shared time and information with each parent, with youth reporting more shared time and disclosure of information with mothers than with fathers, youth may practice conflictual behaviors more with their mothers that then spills over into their sibling relationship (Laursen & Richards, 1994), but not to their friendship. In the father-adolescent relationship, youth may practice less conflictual behaviors (Parke & Buriel, 2007; Shanahan et al., 2007b), ultimately reducing the likelihood of spill over into their sibling relationship and friendships. However, some research suggests that poor conflict resolution styles and hostile behaviors are learned in *both* the mother- and father-adolescent relationships (Cui et al., 2002; Van Doorn et al., 2011), which calls for greater attention to the interpersonal relationship qualities that are learned within and unique to the father-adolescent relationship that may alter friendship dynamics, such as open communication (Updegraff et al., 2002a).

Goal 2: Birth order and sibling gender moderation

A second goal of this study was to explore how birth order and gender may

moderate the associations between parent-youth conflict, sibling negativity and relational victimization, and friendship dynamics. It was predicted that associations between family conflict and friendship dynamics would be stronger for younger siblings, who may experience conflict with multiple individuals of higher status within the family and then generalize such behaviors to their friendships (Bandura, 1977; McHale et al., 2012). While birth-order effects on friendship dynamics did not emerge for parent-youth conflict or the combination of both parent-youth conflict and sibling negativity or relational victimization as predicted, several main effects shed light on the implications of birth order on adolescent friendships. For older siblings, higher sibling negativity was associated with higher friendship control. In accordance with social learning theory, youth may practice negative behaviors within the sibling context, where relationships are deemed involuntary, and generalize such behaviors to friendships (Bandura, 1977). Further, older siblings hold a higher status within the sibling relationship and may engage in congruent relationship dynamics across relationships, such that they serve as leaders in the sibling context and leaders or the "boss" in the friendship context (McHale et al., 2012). The findings of this study also show that for younger siblings, higher sibling negativity was associated with *lower* friendship control. Younger siblings, when compared to older siblings, may have less practice using control tactics in their sibling relationship given their lower status (McHale et al., 2012), and in turn these behaviors do not cross over into other interpersonal contexts.

Birth order differences also emerged in the links between sibling relationship victimization and friendship perspective taking, such that for younger siblings, but not for

older siblings, higher sibling relational victimization was associated with lower friendship perspective taking. Relationally aggressive behaviors consist of a self-oriented focus, which youth may also learn and practice in the context of the sibling dyad if they are on receiving end of such behaviors (Bandura, 1997; Patterson, 1984). When younger siblings have more exposure to these behaviors, they may internalize the self-oriented focus, and in turn engage in less perspective taking in the context of their friendships. Another possible explanation is that in the context of high sibling relational victimization, younger siblings, who hold less power in the sibling relationship (McHale et al., 2012), may use less perspective taking among friends and put their wants and needs first, as they are unable to advocate their wants and needs within their sibling relationship given unequal power dynamics and the manipulative and controlling tactics consistent with relational victimization. An important next step to expand on these findings is to consider the associations between sibling relational victimization and *conflict resolution*, as perspective taking is needed for successful conflict resolution. For example, research examining conflict resolution among siblings with a sample of Mexican American youth suggests that younger siblings use conflict resolution strategies consistent with avoiding conflict, while older sibling use control tactics (Killoren et al., 2008). Considering these prior birth order findings on conflict resolution, it is possible that when younger siblings avoid conflict, they do not learn or practice the perspective taking needed to resolve conflicts in other interpersonal contexts, such as friendships. Another possible next step would be to examine potential underlying mechanisms, such as how sibling conflict resolution strategies or sibling perspective taking may mediate the associations between sibling relational victimization and friendship perspective taking. Examining these

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processes may shed light on the direct links between experiences of relational victimization in the sibling dynamic and friendship perspective taking for these younger, vulnerable youth.

This study also tested whether sibling *gender* moderated the associations between parent-youth, sibling, and friendship dynamics in adolescence. Consistent with evidence that females report more distress in the context of interpersonal stressors as compared to males (Flook, 2011; Telzer & Fuligni, 2013), negative experiences within one's sibling relationship was linked to friendship perspective taking only for females in this study. That is, for females, but not for males, more sibling negativity was associated with less friendship perspective taking, and although not expected, this study also found that for females, more mother-adolescent conflict in combination with *less* relational victimization was associated with *less* friendship perspective taking, suggesting that conflict in the mother-adolescent relationship may be salient for females' friendship outcomes. According to attachment theory, where one's attachment to one's caregiver shapes a working model of interpersonal relationships (Bowlby, 1969; Bretherton & Munholland, 2008), in the context of low sibling relational aggression, it could be that the mother-adolescent relationship serves as a working model of how relationship dynamics within friendships should operate. Further, this finding is in line with research that suggests that poor conflict resolution styles spill over from the parent-youth relationships to friendships (Van Doorn et al., 2011). To expand on these findings, an important next step would be to examine the intervening mechanisms, such as whether higher levels of mother-adolescent conflict lead to lower perspective taking with mothers and then to lower perspective taking in adolescent friendships.

Another sibling gender interaction emerged, such that female youth who reported more mother-adolescent conflict in combination with more sibling relational victimization also reported more friendship control. This was not consistent with the study predictions that friendship control would be stronger for adolescent boys, who are more controlling of best friends when compared to adolescent girls (Updegraff et al., 2002b). This finding for female youth, but not male youth, may be linked to greater shared time and peer socialization practices by parents with their same sex offspring (McHale et al., 2000; Updegraff et al., 2001), such that female youth may learn controlling behaviors within mother-daughter relationship via mother-adolescent conflict, and then engage in controlling behaviors with siblings via sibling relational victimization, and finally, engage in controlling behaviors with friends. One way to examine the aforementioned associations is through cross-lagged panel models to assess bidirectional effects across time and across all three interpersonal relationships (Selig & Little, 2012). In sum, these findings highlight the importance of addressing underlying conflictual family dynamics in intervention and prevention programming aimed at promoting positive friendship dynamics in adolescence for females.

Limitations

This study had several strengths, including longitudinal data and family relationship perspectives from four members of the family, but it is not without limitations. This study included a European American sample, and the findings cannot be generalized to other socio-ethnic contexts, as elements such as cultural orientation and an emphasis on interdependence and family values may impact these associations (Killoren et al., 2008; Parke & Buriel, 2007). For example, cultural aspects lending to greater

caregiving responsibilities from an older sister, and greater restrictions on daughters' peer relationships, when compared to sons' peer relationships, may moderate the associations between family and friendship dynamics for females during adolescence (Parke & Buriel, 2007; Updegraff et al., 2010).

This study also included heterosexual two-parent, married families; however, many other parenting structures exist, including single-parent, divorced, and blended parenting dyads, as well as extended family members who may play a parental role (e.g., grandparents, aunts/uncles). For example, in multigenerational homes, grandparents may serve as a parental or caregiving figure and conflict in this relationship may have implications for other relationships in accordance with family systems theory (Cox & Paley, 1997; Minuchin, 1985). Limited research has examined the associations between the grandparent-adolescent and sibling relationships, as well as the links to friendship dynamics, and should be incorporated into future research examining relationship dynamics across multiple interpersonal contexts (e.g., extended family, parent-youth, sibling, and friend relationships) during adolescence. Another family context that has received limited attention is that of same-gender parenting dyads, such as families that include two female or two male parenting figures. Understanding the similarities and differences in parents' roles and relationship dynamics in families with two same-gender parenting figures will further contribute to our understanding of the interplay among family relationships and their implications for adolescents' friendships.

Turning to the measures used in this study, the measures of parent-adolescent conflict, sibling negativity, and sibling relational victimization did not capture experiences or behaviors through the use of technology given the time period in which

the data were collected. Within the peer literature, research findings indicate that youth perpetrate and experience aggression on the internet, cellphones, and other forms of technology (Pronk et al., 2010; Voulgaridou & Kokkinos, 2015; Werner et al., 2010). However, much less is known about how family members engage in or experience aggressive and conflict behaviors via technology and thus, future research should explore how technology may be used within the context of family and friendships and lend to negative interpersonal relationship dynamics. Further, it is important to note that the friendship conflict measure used in this study was adapted from a sibling conflict measure and may not accurately capture all dimensions of friendship conflict. Related, the reliabilities of the friendship conflict measure were lower than desired (less than .70; Nunnally, 1978; Peterson, 1994), and replication is recommended to examine the associations between mother-adolescent, sibling negativity, and friendship conflict using another friendship conflict measure.

Future Directions

The current study highlighted nuanced associations between parent-youth, sibling, and friendship dynamics during adolescence. Given these associations, it would be prudent to include information and awareness of the impact of negative family dynamics on adolescent friendships to programming aimed at promoting harmonious friendship dynamics. Further, the current study examined sibling relational victimization from the perspective of one sibling (i.e., what their sibling does to them), however, as demonstrated in the peer literature, youth may be perpetrators, victims, and both perpetrators and victims (Wang et al, 2009). An important next step would be to examine

how sibling relational aggression *and* victimization may interact with mother- and father-adolescent relationship qualities in predicting friendship dynamics in adolescence.

Additionally, research examining *maternal psychological control,* which shares similar elements of manipulation and control to that of sibling relational aggression, is linked to higher levels of relational victimization among siblings (Campione-Barr et al., 2014; Yu & Gamble, 2007). To date, little is known about the *bidirectional* associations between maternal and paternal psychological control, sibling relational victimization, and friendship dynamics such as friendship control in adolescence. However, bridging family systems and social interactional theories (Cox & Paley, 1997; Minuchin, 1985; Patterson et al., 1984), youth may experience maternal and/or paternal psychological control and sibling relational victimization at home in adolescence, and then exhibit controlling behaviors in friendships.

This current study examined constructs of negative family and sibling relationship qualities on friendship dynamics. However, both positive and negative parent-adolescent and sibling relationship qualities co-exist, as well as change across adolescence, such that parental warmth and conflict and sibling conflict decline (Kim et al., 2006; Shanahan et al., 2007a; Shanahan et al., 2007b). To account for change overtime in parent-youth and sibling relationship qualities on friendship dynamics, future research should examine the interconnections between family relationships and their respective longitudinal patterns of change across time on friendship qualities. Modeling the developmental and longitudinal patterns of parent, sibling, and friendship qualities will provide greater detail into the associations among these relationships and suggest specific family and friendship qualities that are most crucial to friendship dynamics in adolescence.

Conclusion

      Adolescence is an important time for interpersonal relationships, both inside and outside of the home. The findings of this study provide some evidence that negativity among relationships in the home are interlinked, creating contexts in which negativity spills over into one's friendships, particularly highlighting the importance of accounting for mother-adolescent and sibling relationship linkages in the examination of friendship dynamics in adolescence. Further, it is evident that younger siblings and females are most vulnerable to the spill over of family negativity, highlighting the importance of prevention and intervention programming to address the specific contexts and family relationship dynamics that may put younger siblings and females most at risk for negative friendship dynamics in adolescence.

Dissertation Conclusions

Guided by family systems and social learning perspectives (Bandura, 1977; Cox & Paley, 1997; Minuchin, 1985), these two studies provide new evidence of the implications of sibling relational victimization across multiple interpersonal relationships during adolescence. The present work documented the longitudinal trajectory of sibling relational victimization across adolescence, a time in which interpersonal relationship development is a salient development task (Collins & Steinberg, 2006; Sullivan, 1953) and underscores how various family subsystems, including the often-overlooked sibling relationship and father-adolescent relationship, are interlinked during this time. Further, distinct aspects and conditions were identified for the links among these relationships in regard to mother-adolescent versus father-adolescent relationships. In sum, the findings of this study bridges research on multiple interpersonal relationships and provides new insights on the implications of sibling relational victimization within parent-adolescent, sibling, and friendship contexts during adolescence.

Beyond the interlinked longitudinal associations between family subsystems and friendships dynamics uncovered in this work, this paper also suggests a specific vulnerability of younger siblings and females in the study of sibling relational victimization. Younger siblings, who often learn behaviors from and look up to their older siblings (Bandura, 1977; McHale et al., 2012), and female adolescents, who report more stress due to interpersonal conflicts (Flook, 2011; Telzer & Fuligini, 2013), may experience greater interpersonal distress and poor adjustment outcomes as a result of sibling relational victimization. Taken together, the findings of this study provide important information for intervention and prevention programming aimed at promoting

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positive family and friendship dynamics. It is critical that such materials underscore problematic sibling relationship qualities, specifically sibling relational victimization, as well as the interlinked and spill over of negative relationship qualities across multiple family subsystems into friendships during adolescence.

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APPENDIX A

TABLES AND FIGURES

Table 1

Correlations, Means, and Standard Deviations of Study Variables for Parent Variables

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. RV T1	**.22****	.52***	.56***	-.13	-.13	-.17*	-.18*	-.18*	-.13	.31***	.22**	.26***	.22**	.17*	.23**
2. RV T2	.59***	**.36****	.57***	-.11	-.13	-.18*	-.02	-.12	.00	.23**	.29***	.29***	.18*	.29***	.31***
3. RV T3	.62***	.65***	**.36****	-.09	.12	-.25***	-.13	-.14	-.05	.26***	.24**	.36***	.16*	.22**	.31***
4. AMI T1	-.06	-.06	-.03	**.31****	.68***	.64***	.56***	.47***	.31***	-.16*	-.06	-.13	-.09	.00	.00
5. AMI T2	.05	.02	.01	.79***	**.31****	.66***	.49***	.59***	.40***	-.06	-.03	-.16*	-.00	.02	.02
6. AMI T3	-.07	-.07	-.07	.66***	.74***	**.36****	.44***	.54***	.54***	-.12	-.07	-.26***	-.05	-.14	-.19*
7. AFI T1	-.14	-.07	-.04	.53***	.42***	.44***	**.30****	.70***	.59***	-.14	-.03	.01	-.12	.00	.09
8. AFI T2	-.02	.05	.07	.41***	.49***	.37***	.78***	**.33****	.74***	-.08	-.08	-.12	-.09	-.10	-.07
9. AFI T3	-.02	.02	.03	.41***	.43***	.51***	.66***	.76***	**.31****	.05	-.03	-.08	-.00	-.10	-.12
10. AMC T1	.22**	.18*	.13	-.34***	-.26***	-.22**	-.23**	-.15	-.09	**.15***	.55***	.45***	.80***	.51***	.39***
11. AMC T2	.27***	.36***	.25***	-.25***	-.20**	-.21**	-.11	-.06	-.06	.66***	**.24****	.57***	.56***	.78***	.56***
12. AMC T3	.25***	.41***	.36***	-.20**	-.14	-.22**	-.15*	-.05	-.06	.59***	.77	**.35****	.37***	.49***	.66***
13. AFC T1	.26***	.23**	.17*	-.23**	-.11	-.15	-.37***	-.20**	-.17*	.71***	.60***	.56***	**.25****	.66***	.48***
14. AFC T2	.20**	.32***	.18*	-.10	-.04	-.08	-.11	-.11	-.08	.46***	.78***	.64***	.63***	**.31****	.73***
15. AFC T3	.14	.32***	.23**	-.13	-.03	-.11	-.12	-.04	-.15*	.43***	.64***	.75***	.59***	.77***	**.25****
OS *M*	11.68	11.03	10.60	28.36	28.64	29.63	25.75	26.45	26.28	26.16	24.84	22.39	23.90	21.55	19.98
OS *SD*	4.21	3.58	3.49	5.78	5.22	5.31	6.46	5.51	5.71	6.35	6.80	6.63	6.55	6.41	6.21
YS *M*	12.95	12.13	11.00	28.51	28.43	28.52	26.86	26.47	26.49	26.90	25.45	24.73	24.41	22.81	21.91
YS *SD*	4.21	4.33	4.11	5.58	5.51	5.57	5.25	5.65	5.72	6.87	6.13	5.97	7.15	6.72	5.97

Note. T1= Time; T2 = Time 2; T3 = Time 3; RV = Relational victimization ; AMI = Adolescent-reported mother intimacy; AFI = Adolescent-reported father intimacy; AMC = Adolescent-reported mother conflict; AFC = Adolescent-reported father conflict; OS = Older siblings; YS = Younger siblings. Older sibling correlations are below the diagonal, younger sibling correlations are above the diagonal, and the bolded correlations on the diagonal are correlations between older and younger siblings.

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

Table 2

Correlations, Means, and Standard Deviations of Study Variables for Sibling Variables

Measure	1	2	3	4	5	6	7	8	9
1. RV T1	**.22****	.52***	.56***	-.33***	-.30***	-.29***	.42***	.34***	.31***
2. RV T2	.59***	**.36*****	.57***	-.15*	-.31***	-.32***	.34***	.53***	.46***
3. RV T3	.62***	.65***	**.36*****	-.19**	-.29***	-.47***	.24***	.37***	.47***
4. SI T1	-.19**	-.21**	-.23**	**.44*****	.68***	.53***	-.20**	-.12	-.15*
5. SI T2	-.17*	-.20**	-.23**	.70***	**.48*****	.68***	-.20**	-.15*	-.10
6. SI T3	-.22**	-.25***	-.27***	.65***	.68***	**.57*****	-.15	-.13	-.15*
7. SC T1	.35***	.26***	.26***	-.21**	-.26***	-.24**	**.30*****	.59***	.47***
8. SC T2	.33***	.52***	.38***	-.14	-.20**	-.16*	.58***	**.42*****	.59***
9. SC T3	.19*	.37***	.42***	-.19**	-.24**	-.19**	.54***	.61***	**.37*****
OS *M*	11.68	11.03	10.60	23.39	24.22	25.79	12.96	12.09	10.76
OS *SD*	4.21	3.58	3.49	5.29	5.22	5.50	3.09	3.16	3.13
YS *M*	12.95	12.13	11.00	24.16	24.66	26.46	13.25	12.48	11.41
YS *SD*	4.21	4.33	4.11	5.57	5.90	6.30	3.23	3.27	3.51

Note. T1= Time; T2 = Time 2; T3 = Time 3; RA = Relational victimization; SI = Sibling intimacy; SC= Sibling conflict; OS = Older siblings; YS = Younger siblings. Older sibling correlations are below the diagonal, younger sibling correlations are above the diagonal, and the bolded correlations on the diagonal are correlations between older and younger siblings.
$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

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Table 3

Longitudinal Growth of Sibling Relational Victimization in Adolescence

	Model 1 Linear Baseline	Model 2 L2 Random Intercepts	Model 3 L2 Random Slope	Model 4 L3 Random Slope	Model 5 L2 & L3 Random Slopes	Model 6 Quadratic & L2 Random Linear Slope & Slope Polynomial term	Model 7 Linear Model, Random Intercepts, Covariates, Moderators	Model 8 Final Linear Model, Random Intercepts, Birth Order Covariate
Intercept	11.57***	11.59***	11.63***	11.59***	11.63***	11.50***	11.77***	11.98***
Age-as-Time								
Linear	-0.42***	-0.54***	-0.54***	-0.55***	-0.54***	-0.54***	-0.45**	-0.66***
Quadratic	--	--	--	--	--	--	--	--
Covariates								
Gender	--	--	--	--	--	--	0.40	--
Birth order	--	--	--	--	--	--	-0.77*	-0.78*
Sib. DC	--	--	--	--	--	--	-0.27	--
Interactions								
Gender*RV	--	--	--	--	--	--	-0.15	--
BO*RV	--	--	--	--	--	--	-0.23	--
Sib. DC*RV	--	--	--	--	--	--	-0.05	--
Random effects								
L1 Residual	16.03***	6.83***	6.80***	6.82***	6.80***	6.77***	6.76***	6.79***
L2 Intercept	--	4.67***	4.80***	--	4.81***	4.87***	4.75***	4.65***
L2 Linear Slope	--	--	-0.60*	--	-0.63*	-0.66**	--	--
L2 Variance of Linear Slope	--	--	NC	--	NC	NC	--	--
L3 Intercept	--	4.74***	4.75***	4.66***	4.72***	4.80***	4.80***	4.78***
L3 Linear Slope	--	--	--	-0.35	0.04	--	--	--
L3 Variance of Linear Slope	--	--	--	NC	NC	--	--	--
Model Comp.								
Log Likelihood	6374.3	5996.1	5987.2	5992.9	5987.2	5990.4	--	--
(df)LR diff.	--	(2)378.2**	(3)8.9*	(3)3.2	(4)8.9	(3)5.7	--	--

Note. NC = Non-convergent; Sib. =Sibling; DC = Dyad constellation; RV= Relational victimization; BO= Birth order; L1 = Level 1; L2; Level 2; L3 = Level 3. Comp. = Comparison; LR= Likelihood Ratio; Diff = difference. Time centered at mean age (16 years old). Gender coded 0 = female; 1 = male. Birth order coded 0 = older siblings; 1= younger siblings. DC coded 0 = opposite-sex dyad constellation; 1 = same-sex dyad constellation.
*p < .05; **p < .01; ***p < .001.

Table 4

Results from Multilevel Models with Mother and Father Intimacy and Conflict Predicting Sibling Relational Victimization

| | Sibling Relational Victimization | |
	Model 1a	Model 1b
Fixed effects		
Intercept	0.76(0.73)	0.76(0.72)
Time		
Linear	-0.56(0.11)***	-0.57(0.11)***
Covariates		
Birth order	0.15(0.55)	0.14(0.55)
DC	0.12(0.37)	0.11(0.37)
Sibling Gender	0.38(0.32)	0.38(0.32)
Age at T1	0.35(0.21)	0.36(0.21)
Age spacing	-0.31(0.23)	-0.31(0.23)
Family SES	-0.40(0.24)	-0.40(0.23)
Predictors		
BP Mother Intimacy	-0.03(0.04)	-0.02(0.04)
WP Mother Intimacy	-0.01(0.84)	-0.00(0.03)
BP Mother Conflict	0.19(0.05)***	0.19(0.05)***
WP Mother Conflict	0.06(0.03)	0.06(0.03)*
BP Father Intimacy	-0.01(0.04)	-0.01(0.04)
WP Father Intimacy	0.02(0.03)	0.12(0.04)**
BP Father Conflict	0.00(0.05)	0.00(0.05)
WP Father Conflict	0.08(0.03)*	0.13(0.04)**
Interactions		
WP Father Intimacy X Sibling DC	---	-0.23(0.06)***
WP Father Conflict X Sibling DC	---	-0.11(0.05)*
Random effects		
L1 residual	6.55(0.35)***	6.43(0.34)***
L2 inter. var.	4.56(0.74)***	4.60(0.74)***
L3 inter/linear var.	2.78(0.77)***	2.78(0.76)***

Note. DC = Dyad constellation; BP = Between-person effect; WP = Within-person effect; L1 = Level 1; L2 = Level 2; L3 = Level 3; Inter. = Intercept; Var. = Variance. Time centered at mean age across both siblings and timepoints (16 years old). Gender coded 0 = female; 1 = male. Birth order coded 0 = older siblings; 1= younger siblings. DC coded 0 = mixed-gender dyad constellation; 1 = same-gender dyad constellation. Dashed lines indicate non-significant interactions that were removed from final models.
$^*p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Table 5

Results from Multilevel Models with Sibling Intimacy and Conflict Predicting Sibling Relational Victimization

	Sibling Relational Victimization	
	Model 1a	Model 1b
Fixed effects		
Intercept	0.88(0.60)	0.91(0.60)
Time		
Linear	-0.31(0.11)**	-0.34(0.11)**
Covariates		
Birth order	0.36(0.50)	0.36(0.50)
DC	-0.26(0.31)	-0.26(0.31)
Sibling Gender	0.06(0.29)	0.06(0.29)
Age at T1	0.16(0.20)	0.19(0.20)
Age spacing	-0.33(0.19)	-0.33(0.19)
Family SES	-0.38(0.20)	-0.38(0.20)
Predictors		
BP Sibling Intimacy	-0.16(0.03)***	-0.16(0.03)***
WP Sibling Intimacy	-0.11(0.03)***	0.02(0.04)
BP Sibling Conflict	0.54(0.06)***	0.54(0.06)***
WP Sibling Conflict	0.32(0.04)***	0.32(0.04)***
Interactions		
WP Sibling Intimacy X Birth order	---	-0.21(0.05)***
Random effects		
L1 residual	6.14(0.32)***	6.02(0.31)***
L2 inter. var.	4.51(0.70)***	4.55(0.70)***
L3 inter/linear var.	1.08(0.77)*	1.08(0.58)*

Note. DC = Dyad constellation; BP = Between-person effect; WP = Within-person effect; L1 = Level 1; L2 = Level 2; L3 = Level 3; Inter. = Intercept; Var. = Variance. Time centered at mean age across both siblings and timepoints (16 years old). Gender coded 0 = female; 1 = male. Birth order coded 0 = older siblings; 1= younger siblings. DC coded 0 = mixed-gender dyad constellation; 1 = same-gender dyad constellation. Dashed lines indicate non-significant interactions that were removed from final models.
*$p < .05$; **$p < .01$; ***$p < .001$.

Table 6

Correlations, Means, and Standard Deviations of Study Variables.

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. FRCA T1	**.51*****	.66***	.31***	.32***	.15*	.12	-.04	-.01	-.06	-.08	-.11	-.01
2. MRCA T1	.66***	**.42*****	.41***	.46***	.14	.13	.01	.02	-.02	-.04	-.12	-.00
3. ARCF T1	.35***	.33***	**.20****	.78***	.27***	.32***	.14	.12	.18*	.09	-.10	-.06
4. ARCM T1	.38***	.31***	.71***	**.14**	.28***	.38***	.07	.14	.17*	.07	-.11	-.07
5. SRV T1	.20**	.17*	.25***	.33***	**.21****	.53***	.08	.08	.10	.09	-.20**	-.16*
6. NEG T1	.08	.09	.41***	.40***	.41***	**.33*****	.08	.01	.22**	.18*	-.11	-.11
7. FCTRL T1	.12	.09	.14	.22**	.24***	.21**	**.17***	.60***	.41***	.27***	-.21**	-.06
8. FCTRL T2	.16	.04	.12	.15*	.18*	.23**	.69***	**.11**	.30***	.34***	-.07	-.03
9. FCONF T1	.11	.08	.05	.11	.22**	.27***	.35***	.32***	**.20****	.68***	-.27***	-.19**
10. FCONF T2	.12	.13	.11	.11	.17*	.29***	.33***	.35***	.66***	**.10**	-.27***	-.21**
11. FPERST T1	-.00	.01	-.19**	-.16*	-.13	-.17*	-.14	-.14	-.04	-.13	**.02**	.58***
12. FPERST T2	.03	-.06	-.03	-.05	.06	-.09	-.13	-.06	-.12	-.08	.26***	**-.04**
OS *M*	26.74	27.21	24.83	26.78	13.43	14.00	16.25	15.59	5.86	5.53	16.08	15.56
OS *SD*	7.86	7.29	7.29	6.86	4.22	3.48	5.05	4.74	2.09	1.78	2.68	3.19
YS *M*	26.93	28.38	25.76	27.66	13.64	14.28	15.59	15.31	5.65	5.51	16.35	16.13
YS *SD*	6.98	8.49	8.52	7.94	4.52	3.87	4.98	4.37	2.21	1.90	2.80	2.94

Note. T1= Time; T2 = Time 2; FRCA = Father-reported conflict with adolescent; MRCA = Mother-reported conflict with adolescent; ARCF = Adolescent-reported conflict with father; ARCM = Adolescent-report conflict with mother; SRV = Sibling relational victimization; NEG = Sibling negativity; FCTRL = Friendship control; FCONF = Friendship conflict; FPERST = Friendship perspective taking; OS = Older siblings; YS = Younger siblings; *M* = Construct Mean; *SD* = Standard Deviation. Older sibling correlations are below the diagonal, younger sibling correlations are above the diagonal, and the bolded correlations on the diagonal are correlations between older and younger siblings.

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

Table 7

Unstandardized Model Parameters for Final Model

Parameters	Friendship Control T2			Friendship Conflict T2			Friendship Perspective Taking T2		
	b	*SE*	*p* value	*b*	*SE*	*p* value	*b*	*SE*	*p* value
Intercept	**5.59**	0.94	.000	**2.74**	0.31	.000	**8.71**	1.25	.000
Covariates T1									
Sibling gender	0.17	0.38	.652	**0.41**	0.16	.008	**-1.77**	.274	.000
Birth order	0.10	0.36	.722	0.11	0.15	.461	0.34	0.27	.211
Friendship Closeness	0.28	0.41	.486	-0.25	0.14	.063	0.56	0.33	.095
Friendship Control	**0.58**	0.04	.000	---	---	---	---	---	---
Friendship Conflict	---	---	---	**0.52**	0.04	.000	---	---	---
Friendship Perspective Taking	---	---	---	---	---	---	**0.42**	0.06	.000
Main Effects T1									
Con-FA	-0.01	0.03	.642	0.00	0.01	.784	0.03	0.02	.178
Con-MA	-0.01	0.03	.668	-0.00	0.01	.954	0.00	0.02	.998
Con-AF	-0.03	0.03	.460	0.00	0.01	.764	0.02	0.03	.564
Con-AM	0.06	0.04	.106	-0.01	0.01	.451	-0.03	0.03	.409
SRV	0.03	0.05	.627	-0.00	0.02	.813	-0.01	0.04	.773
SNEG	-0.01	0.05	.914	0.04	0.03	.163	-0.03	0.04	.528
Interactions T1									
Con-FA*SRV	-0.01	0.01	.351	-0.00	0.00	.199	-0.00	0.00	.882
Con-MA*SRV	0.01	0.01	.091	-0.00	0.00	.302	0.00	0.00	.981
Con-AF*SRV	0.00	0.01	.982	0.00	0.00	.481	0.00	0.00	.963
Con-AM*SRV	-0.01	0.01	.241	0.00	0.00	.730	0.00	0.00	.360
Con-FA*SNEG	-0.01	0.01	.271	-0.00	0.00	.500	-0.00	0.00	.708
Con-MA*SNEG	-0.01	0.01	.535	0.00	0.00	.115	**-0.01**	0.00	.051
Con-AF*SNEG	-0.00	0.01	.833	0.00	0.00	.608	0.00	0.00	.888
Con-AM*SNEG	0.02	0.01	.212	**-0.00**	0.00	.019	0.00	0.00	.288
R^2 *full model*	**0.44**	0.04	.000	**0.48**	0.05	.000	**0.29**	0.04	.000

Note. N = 193 families. T1= Time; T2 = Time 2; Con-FA = Father-reported conflict with adolescent; Con-MA = Mother-reported conflict with adolescent; Con-AF = Adolescent-reported conflict with father; Con-AM = Adolescent-report conflict with mother; SRV = Sibling relational victimization; SNEG = Sibling negativity; Sibling gender coding is as follows: 0 = female, 1 = male; Birth order coding is as follows: 0 = older, 1 = younger. Bolded coefficients are significant at $p \leq .05$.

Table 8

Multiple-Group Moderation by Sibling Birth Order

Model	χ^2 (*df*)	RMSEA [90% CI]	CFI	SRMR	Models Compared	S-B Scaled $\Delta\chi^2$ (Δdf)[a]
Birth Order (Older sibling N = 191; Younger sibling N = 190)						
1 Free Regression Coefficients	23.91(12)*	.07 (.03, .11)	.98	.02	-	-
2 Fixed Regression Coefficients	89.39(63)*	.05 (.02, .07)	.96	.05	1 vs. 2	64.99 (51)

Note. *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; 90% CI= 90% Confidence Interval for RMSEA; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual. [a]The Satorra-Bentler scaled chi-square difference test was used to test differences between the nested models.
*$p < .05$

Table 9

Multiple-Group Moderation by Sibling Gender

Model	χ^2 (*df*)	RMSEA [90% CI]	CFI	SRMR	Models Compared	S-B Scaled $\Delta\chi^2$ (Δdf)[a]
*Youth Gender (Female N = 182; Male N = 199)*						
1 Free Regression Coefficients	11.78 (12)	.00 (.00, .07)	1.00	.02	-	-
2 Fixed Regression Coefficients	66.28 (63)	.02 (.00, .05)	.99	.04	1 vs. 2	54.59 (51)

Note. *df* = degrees of freedom; RMSEA = Root Mean Square Error of Approximation; 90% CI= 90% Confidence Interval for RMSEA; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual. [a]The Satorra-Bentler scaled chi-square difference test was used to test differences between the nested models.
[*]*p* < .05

Figure 1

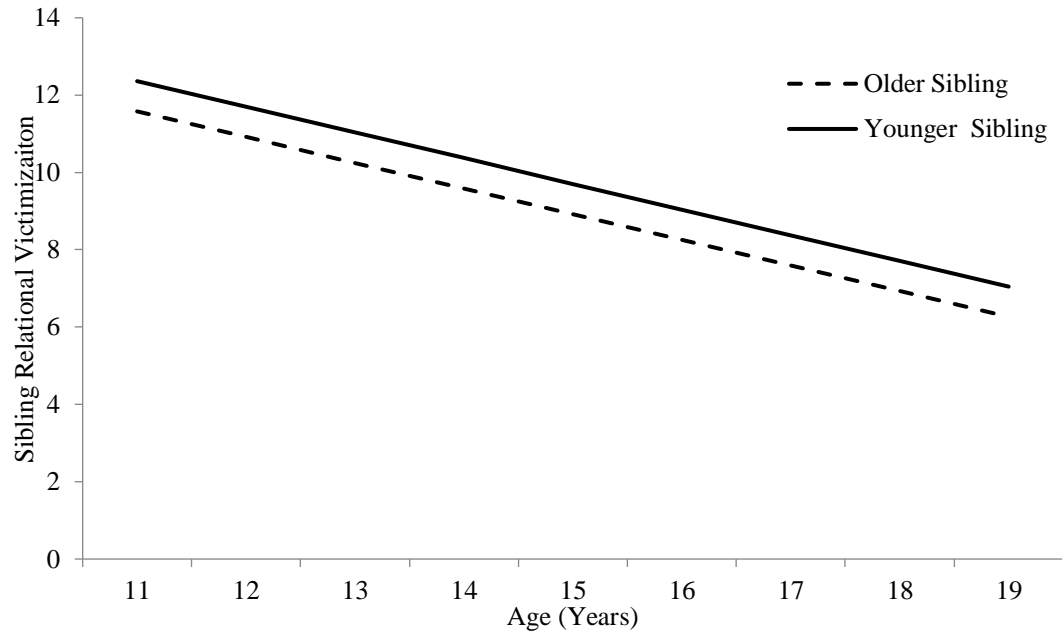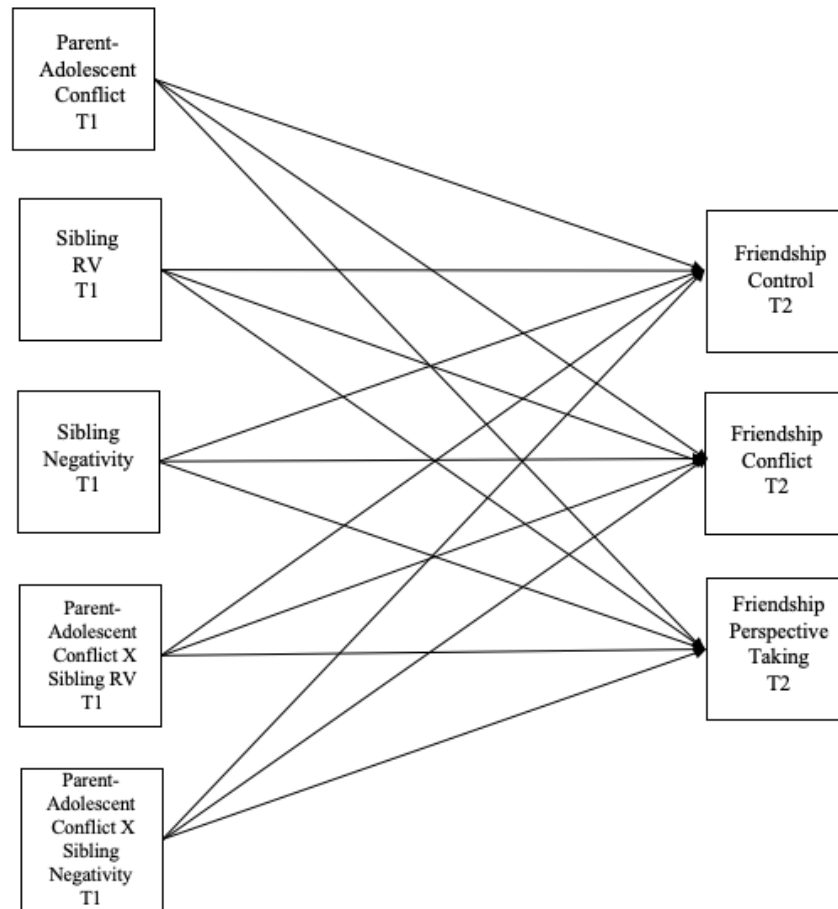*Developmental Changes in Sibling Relational Victimization in Adolescence*

Figure 2

Path Analytic Model Examining the Associations between Parent-Adolescent Conflict

and Sibling Negativity and Relational Victimization on Friendship Dynamics

Note. The associations between parent-adolescent conflict and friendship control,

conflict, and perspective-taking as moderated by sibling relational victimization and

sibling negativity. Final model includes four reporters of parent-adolescent conflict

(mother, father, older, and younger sibling). Model covariates include sibling age

spacing, family size, family SES, and best friend stability (not pictured).

Figure 3

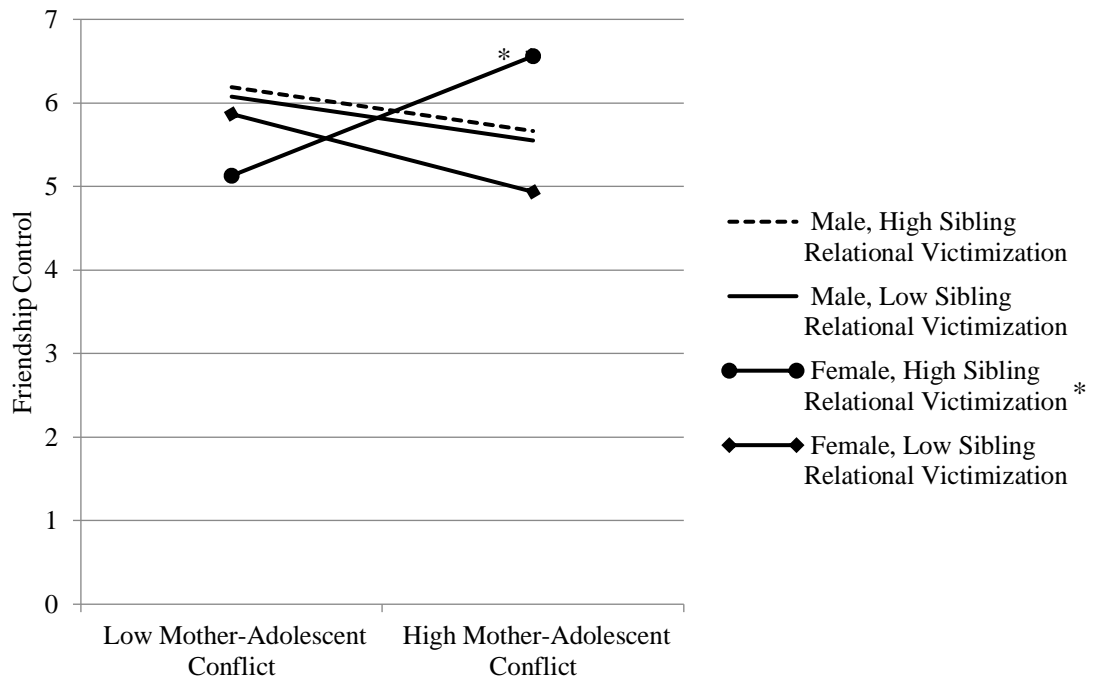*Mother Adolescent Conflict and Sibling Negativity Interaction on Friendship Conflict*
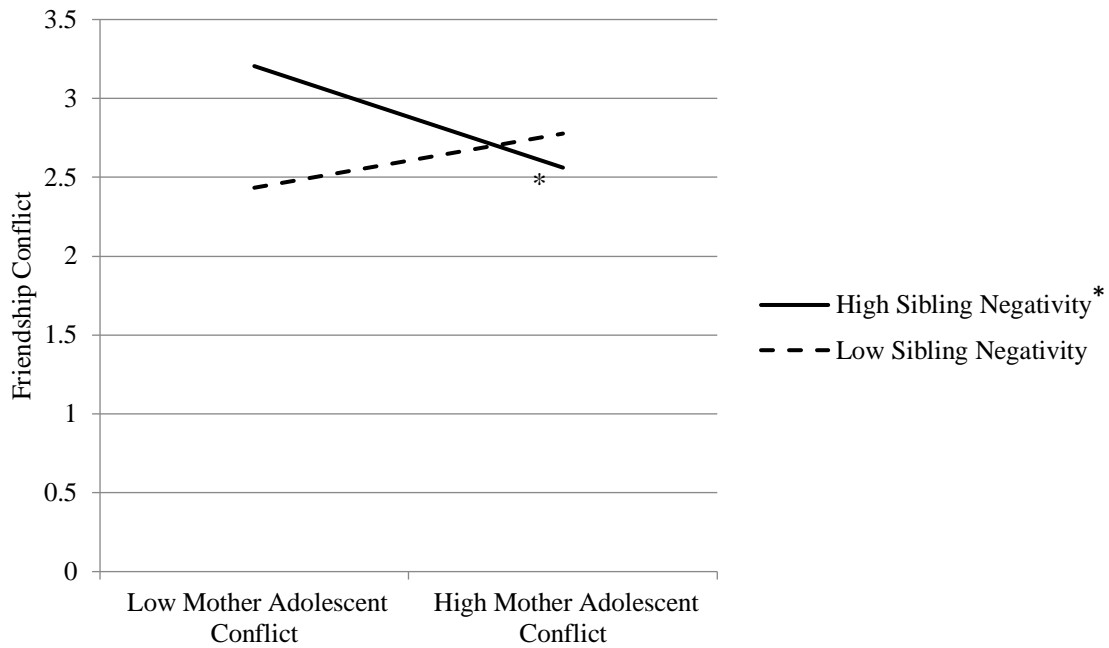
Note. Significant two-way interaction between adolescent reported mother-adolescent conflict and sibling negativity on friendship conflict, such that the slope is negative for mother adolescent conflict when sibling negativity is high. High sibling negativity is one standard deviation below the mean and low sibling negativity is one standard deviation above the mean.

$^{*}p < .05$

Figure 4

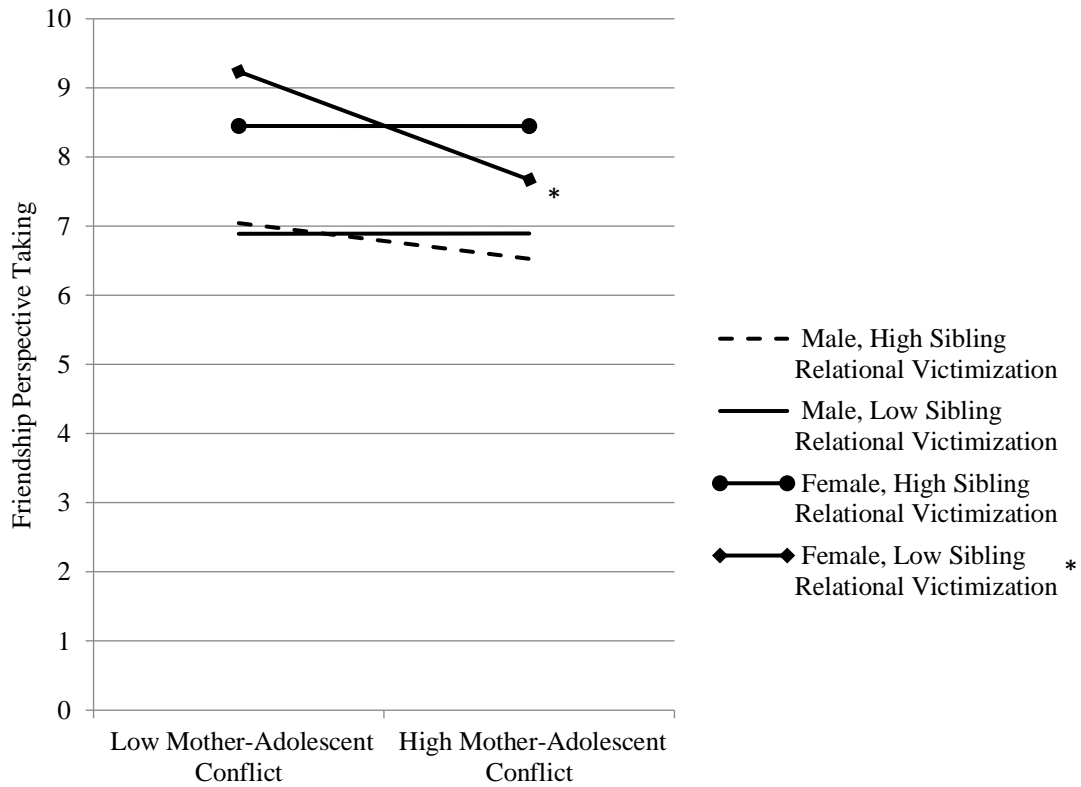*Mother-Adolescent Conflict and Sibling Relational Victimization on Friendship Control*

Note. Significant three-way interaction between mother reported mother-adolescent conflict, sibling relational victimization, and sibling gender on friendship control, such that the slope for females is positive for mother-adolescent conflict when sibling relational victimization is high. High sibling relational victimization is one standard deviation below the mean and low sibling relational victimization is one standard deviation above the mean.

$^*p < .05$

Figure 5

Mother-Adolescent Conflict and Sibling Relational Victimization on Friendship

Perspective Taking

Note. Significant three-way interaction between adolescent reported mother-adolescent conflict, sibling relational victimization, and sibling gender on friendship perspective taking, such that the slope for females is negative for mother-adolescent conflict when sibling relational victimization is low. High sibling relational victimization is one standard deviation below the mean and low sibling relational victimization is one standard deviation above the mean.

*p < .05

APPENDIX B

SIBLING RELATIONAL VICTIMIZATION SCALE

Appendix B. *Sibling Relational Victimization Scale*

1. (HE/SHE) tries to hurt me by calling me names and making fun of me in front of other kids.

2. (HE/SHE) tells my secrets to other kids when (HE/SHE) is mad at me.

3. (HE/SHE) leaves me out of things when (HE/SHE) is mad at me.

4. (HE/SHE) tells me that (HE/SHE) won't like me anymore unless I do what (HE/SHE) says.

5. (HE/SHE) embarrasses me in front of other kids because (HE/SHE) wants to hurt me.

6. (HE/SHE) ignores me when (HE/SHE) is mad at me.

Note. Adolescent siblings were asked in separate interviews: "Please show how often each of the following has happened in the past year." Response options: Never (1), Seldom (2), Sometimes (3), Fairly Often (4), and Very Often (5). Higher summed scores denote greater relational victimizations experiences.

APPENDIX C

INSTITUTIONAL REVIEW BOARD APPROVAL DOCUMENT

APPROVAL:CONTINUATION

Kimberly Updegraff
CLAS-SS: Social and Family Dynamics, T. Denny Sanford School of (SSFD)
480/965-6669
Kimberly.Updegraff@asu.edu

Dear Kimberly Updegraff:

On 2/26/2021 the ASU IRB reviewed the following protocol:

Type of Review:	Continuing Review
Title:	Penn State Family Relations Project
Investigator:	Kimberly Updegraff
IRB ID:	STUDY00000678
Category of review:	
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	None

The IRB approved the protocol from 2/26/2021 to 2/25/2022 inclusive. Three weeks before 2/25/2022 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 2/25/2022 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Phuong Thao Ha

Annabella Sarama