Journal of Child & Adolescent Behavior

Pauldine, et al., J Child Adolesc Behav 2015, 3:4
DOI: 10.4172/2375-4494.1000231

Research Article Open Access

Predicting Sibling Relationship Quality from Family Conflict: A Longitudinal Study from Early Adolescence to Young Adulthood

Michael R Pauldine[1*], James Snyder[1], Lew Bank[2] and Lee D Owen[2]

[1]*Department of Psychology, Wichita State University, 1845 Fairmount Box 34, Wichita, KS 67260-0034, USA*

[2]*Department of Psychology, Oregon Social Learning Center, 160 East 4th Avenue, Eugene, OR 97401, USA*

[*]**Corresponding author:** Michael R Pauldine, Department of Psychology, Wichita State University, 1845 Fairmount Box 34, Wichita, KS 67260-0034, USA, Tel: +1-316-978-3170; Fax: +1-316-978-3086; E-mail: mrpauldine@wichita.edu

Received date: July 03, 2015, **Accepted date:** August 06, 2015, **Published date:** August13, 2015

Abstract

Socialization experiences in the family have profound and lasting effects on development. The present study investigated whether exposure to family conflict in early adolescence influences relationship quality with siblings during young adulthood. Using a longitudinal design, observations of family conflict were used to predict self- and other-reported sibling relationship quality a decade later in an at-risk sample of 98 male and female older siblings of target boys in the Oregon Youth Study. Results indicated that familial conflict during early adolescence reliably predicted quality of sibling relationships during emerging adulthood. These findings are discussed with respect to social learning theory, previous research, and treatment implications.

Keywords: Family conflict; Siblings; Early adolescence; Young adulthood; Social learning theory

Introduction

A large body of research suggests that experiences in the family have a strong and lasting influence on the development, adjustment, and functioning of children. This is of little surprise given that parents are typically the primary individuals responsible for rearing children and relationships within the family-including those between siblings-provide both direct experience and modeling related to social and cognitive development [1,2]. Given the profound role of parents, a number of studies have illustrated the powerful and far-reaching influence parenting can have on children's outcomes. When it comes to parenting, the management of conflict and problem behavior is particularly important. Supportive discipline by parents of early adolescents has been found to be associated with a number of youth prosocial behaviors, including altruism and agreeableness [3]. Alternatively, the use of harsh disciplinary techniques with adolescents is related to increased reports of youth depression, anxiety, and conduct problems [4,5] while lax or inconsistent parental discipline is predictive of youth substance use [6]. Although parents play a critical role in their children's lives, siblings also exert notable influence on their brothers and sisters.

In comparison to the literature on parental and peer influences on youth, the role of siblings in socialization has received relatively limited attention. This limitation is particularly significant given three salient and unique qualities of siblings. First, the occurrence of one or more sibling in a household is prevalent, as nearly 80% of individuals have siblings [7] while more recent estimates place this figure closer to 90% [8]. Second, sibling relationships are among the longest lasting across the lifespan [9-11], as direct influence from parents tends to diminish across development and influence from intimate partners comes later. Third, given that relationships with similar-aged siblings are horizontal as opposed to vertical (as with parents), siblings play a distinct and influential role in each other's lives (see below). Although peers also have horizontal relationships and their influence is well recognized in the literature [12,13] and particularly during adolescence, children and adolescents spend more time with their siblings than either parents or peers [14,15].

Taken together, these relationship qualities result in a number of significant implications stemming from both sibling relationships and characteristics of brothers and sisters. In a recent meta-analysis, for example, [16] found that sibling warmth is protective against internalizing and externalizing problems and, similarly, sibling affection reduces risk for internalizing symptoms in the context of stressful life events [17]. Academic success of older siblings is also related to increased valuation of school and higher grade point averages by younger brothers and sisters [18], while more recent research also suggests that siblings rated as more academically competent by parents demonstrate higher grades the following year when controlling for siblings' average grades and prior differences in performance [19]. Although relationship strength and influence are dependent on sibling sex constellation, empathy development in younger siblings is influenced by characteristics of older siblings, while younger brothers and sisters appear to have limited impact on the formulation of empathy in older siblings [20,21]. Likewise, the degree to which sibling intimacy influences the acceptance of familism values, defined as emphasizing emotional support and interdependence, was also dependent on sibling sex constellation among families of Mexican origin [22].

In addition to positive outcomes, siblings can also promote maladjustment and dysfunction. For instance, attributes of siblings or the sibling relationship can increase the risk for delinquent and antisocial behaviors, including alcohol and substance use [23-26] early sexual activity [27,28] as well as aggression towards peers, deviant peer associations, and criminal arrests [1,29-31]. Importantly, a number of these studies controlled for influences of other prominent socialization agents, namely parents and peers, and twin and adoption studies control for shared genetics, parenting, and environments, suggesting

that siblings contribute uniquely to the development and maintenance of deviancy.

Although it is clear that parents and siblings have a profound influence on individuals' development, few studies have examined the direct effect of parent-child and sibling conflict during early adolescence on sibling relationship quality in emerging adulthood. This is a significant limitation because, according to social and observational learning theory, the family serves as a powerful model for future relationships and shapes social behavior contributing to the quality of those relationships. The present study aims to address this limitation using data from the longitudinal Oregon Youth Study (OYS) of at-risk families to examine the prospective association of family conflict during early adolescence with the quality of sibling relationships in young adulthood.

Social Learning Theory

Social and observational learning theory provides a useful framework by which to understand the effects of family conflict on youth's later social development. Building upon principles of learning based in behaviorism and operant conditioning, Bandura's et al. [32,33] social learning theory posits that individuals learn behavior patterns through both direct experience and observation of others' behavior. Specifically, the theory maintains that behaviors are acquired and strengthened through direct experiences with environmental antecedents and consequences, while also emphasizing the role of internal cognitive processes by which behaviors can be learned vicariously through observing others and the various consequences for those behaviors [32-34]. Therefore, one avenue for social learning is through the modeling and imitation of others.

The family provides profoundly influential modeling experiences for youth. The likelihood of an observer imitating a model is increased if: (a) there is a power differential, (b) nurturance is involved, and (c) there is similarity to the observer [35]. Clearly each of these apply to the family, as there is an imbalance of power between parents and children, the role of nurturing is typically placed on parents but may also involve older siblings, and there are similarities between parents and children (e.g., gender, personality, physical appearance) as well as between siblings (e.g., age, interests, peers). Youths' imitation of their parents has been demonstrated in a number of domains, including teenage alcohol consumption [36], adult intimate relationships [37], as well as anxiety and anxiety-maintaining behaviors (i.e., escape and avoidance; [38,39]. Imitation has also been shown between siblings, such as in the areas of risky sexual behavior and teen pregnancy [27,40], substance use [26,41], as well as delinquent and antisocial behaviors [42,43], while other prosocial behaviors such as empathy [21] and behavioral control [44] can also be learned via siblings. These studies illustrate the impact of social learning within the family and are consistent with Bandura's theory. Therefore, given that family members and relationships are imitated in various domains, exposure to familial conflict as an adolescent likely also results in lasting and significant developmental effects, especially regarding characteristics and quality of relationships later in development.

Consequences of parental and sibling conflict

Although there is little research examining the direct effect of familial conflict in early adolescence on the quality of sibling relationships years later, a number of studies have examined the consequences of conflict within the family more generally. Much of this literature has focused on outcomes related to deviant and antisocial behaviors. Using data from the OYS study, but focusing on different family dyads than the present study [45], found that conflict between children and mothers and between siblings increased the risk for antisocial behavior in both younger brothers and sisters during adolescence. Although the authors examined a directional model of sibling influence going from older to younger, they suggest that coercive and conflictual family interactions are a systemic social process that affects all family members rather than solely being unidirectional. In a similar vein, Snyder et al. [43] report that these predictors were synergistically associated with increased risk for younger brothers' and sisters' maladjustment and antisocial behaviors. Their findings also suggest that early sibling conflict may be predictive of conflictual and aggressive interpersonal relations, especially when sibling conflict is paired with ineffective parenting strategies [29] however; this association was not tested directly. In another longitudinal study, parent-child and sibling conflict was again found to be associated with risky youth behaviors [46]. Solmeyer et al. uniquely examined both between- and within-person outcomes of sibling conflict. Analysis of the latter permitted directional inferences and suggested that when youths reported higher levels of sibling conflict, even when controlling for the effects of parent-child conflict, there was increased participation in risky behavior. Although again not directly examined, the authors also discuss how their findings imply that youths engaged in a conflictual relationship with their sibling may apply this interpersonal approach to other relationships. Additional research suggests that family conflict temporally precedes youth risky behaviors rather than vice versa [47,48]. These studies and others [49-51] illustrate that familial conflict—including parent-parent, parent-child and sibling conflict—increments risk for youth participation in risky, deviant, and antisocial behaviors. Although a substantial proportion of the research on familial conflict examines outcomes for youth externalizing problems, there are other developmental outcomes that have received attention.

Familial conflict seems to have a particularly strong impact on the development of youth internalizing psychopathology. In a meta-analysis on youth outcomes associated with exposure to interparental conflict, [52] found that effect sizes were larger for internalizing than for externalizing problems. [53] indicate that young adults' retrospective reports of perceived exposure to conflict between parents was associated with low levels of present psychological adjustment, including increased depression and anxiety symptoms and loss of emotional or behavioral control. Turning to the influence of sibling conflict on internalizing psychopathology specifically [54], examined the link between sibling conflict in middle childhood and psychological adjustment 2 years later in early adolescence. Findings indicated that conflict between siblings accounted for unique variance in levels of anxiety and depression during adolescence over and above variance explained by other factors, including parental hostility and marital conflict. However, earlier levels of youth psychological functioning did not account for significant variance of sibling conflict in adolescence; that is, sibling conflict predicted psychological adjustment 2 years later, while the reverse was not supported. Likewise, another longitudinal study found that sibling conflict during middle childhood was associated with adolescent depression for both boys and girls, after controlling for parent-child relationship quality as well as parental and sibling adjustment [55]. In sum, it appears that exposure to conflict within the family, including sibling conflict, has implications for youth psychopathology and psychological adjustment, including increased risk for both internalizing and externalizing problems.

Although there are no longitudinal studies (to the author's knowledge) that explicitly examine how family conflict during early adolescence affects young adult sibling relationship quality, there have been a few reports on the consequences of familial conflict on interpersonal relationships more generally, with many focusing on intimate partners. In a study by Rhoades et al. [37] that used retrospective self-reports, participants who indicated they had been exposed to parental conflict reported more involvement in intimate relationships characterized by poor adjustment and negative communication (e.g., heated arguments, name-calling). Not surprisingly, Rhoades et al. [37] also indicated that adult offspring judged conflictual parental relationships to provide poor models for their own intimate relationships. However, even though offspring may recognize that conflictual parental relationships serve as poor models, children of divorced parents tend to have higher divorce rates themselves [56,57], suggesting that marital instability and problems are transmitted across generations [58]. Another recent study using retrospective self-report and qualitative measures found that women who experienced parental divorce and conflict during middle childhood to early adolescence trusted their partners less, had decreased confidence in relationship sustainability, and had greater difficulties forming relationships [59]. The authors suggest that observing parental discord and conflict may impede the natural development of healthy interpersonal relationships.

In addition to parental conflict, conflict between siblings also seems to influence later intimate relationships. In a two-year longitudinal study with adolescents, [60] reports that sibling conflict negatively predicted romantic intimacy during late adolescence among girls. In another longitudinal study, this one using the OYS data, [31] found that the OYS boys had 3 times more observed negative interaction with intimate partners and siblings than with friends during late adolescence. The OYS boys had been exposed to high levels of family negativity (e.g., verbal attacks, physical aggression) in middle childhood and had histories of deviancy and antisocial behavior. This finding may imply that intimate relationships tend to be more similar to conflict levels in family dyads (e.g., between siblings) while lower levels of aversive interactions characterize friendships.

Although studies examining the link between family conflict and features of later interpersonal relationships contribute to the literature, they are not without limitations. The frequent use of retrospective report of family conflict may be particularly subject to bias given the length of time since exposure and involvement in the conflict being reported. With one notable exception [31] the studies also fail to assess conflict between multiple family member dyads. Most previous studies generally include only parental conflict as a predictor (excluding parent-child and sibling conflict) and typically focus on only intimate partner relationships as the outcome (excluding sibling relationships). Given these limitations, a longitudinal and more comprehensive examination of the relation between multi-dyadic family conflict and the quality of sibling relationships in later development is warranted. The objective of the present study is to address these limitations, which will significantly contribute to the literature insofar as this study aims to more completely represent the various types of conflict that naturally exist within a family system while also highlighting an outcome variable that has traditionally been neglected.

The present study uses data from the OYS, which was a longitudinal project with multiple assessment waves spanning a period of over 10 years. A subsample of 98 at-risk families participated in the current study, including mothers, fathers, a younger brother (OYS target child), and an older brother or sister of the target child. Familial conflict between parents and children and between siblings were observed during unstructured family interaction tasks in the home setting at Time 1 when older siblings were early adolescents and younger brothers were in middle childhood (approximately 10 years of age). Self- and other-report measures of older siblings' relationship quality with their siblings were collected a decade later at Time 2, when older siblings were young adults. Congruent with social learning theory, it was hypothesized that levels of family conflict at Time 1 will predict Time 2 sibling relationship quality. More specifically, exposure to higher levels of familial conflict in early adolescence will be associated with poorer interpersonal relationship quality with siblings in early adulthood.

Method

Participants

The OYS [61,62] sample consists of 206 boys and their families. Of the whole sample, 182 families had at least one younger or older sibling in the household at Time 1 when the OYS target boys were 10 years old and in the 4th grade. Families were largely lower or working class and the mean family income at Time 1 was between $10,000 and $15,000 (in 1983-1984). In 20% of families, there was no employed parent and 33% of families received government assistance. Mean parental education was slightly greater than 12 years with 28% of the parents not completing high school and 7% graduating from college. At Time 1, 33% of families had two biological parents in the home, 33% had one biological and one stepparent (almost exclusively stepfathers), and 33% had a single biological parent (90% mothers). It was not uncommon for families to move, as 50% of the sample relocated within the first 2 years of the study. The majority of families lived in high crime neighborhoods and the sample was recruited from public schools serving areas with higher than average rates of juvenile delinquency. More than half of the OYS boys had been arrested at least once by age 18 and 33% had been arrested multiple times.

The subsample used in the present study was comprised of 98 families with an adolescent older sibling to the target OYS boys at Time 1. There was more than one older sibling in 25 of the families. In these cases, only data from the older sibling closest in age to the OYS boy were included in the analyses, as older siblings closest in age with the OYS boys are likely to have the most powerful influence on one another [32,33,35]. Of the older siblings, 48 were male and 50 were female and they had a mean age of 14.32 years (SD=1.49) at Time 1 and 24.32 years (SD=1.49) at Time 2. Older siblings were on average 19.26 years old (SD=2.30) when they last lived with their OYS target brother. They were largely European American (85%) and mostly biological (78%) or half-siblings (18%) to the OYS boys. Participation rates were high from Time 1 to Time 2, as attrition was less than 10% of the sample.

Procedures

Three in-home observations were conducted at Time 1. These yielded 60 minutes of unstructured observations between parent(s), sibling(s), and the OYS boy. These videos were coded for familial conflict as described below. At Time 2, questionnaires concerning older siblings' relationship quality with their younger OYS siblings were collected. These questionnaires were completed by older siblings (i.e., self-report) and by their mothers. Therefore, data collection was both

multimethod (observational and paper-and-pencil questionnaires) as well as multiagent (self- and mother-report).

Measures

Predictor: Family conflict: The family conflict variable was derived from in-home observations of unstructured family interaction. Observers coded conflict bouts in the family using the Family Process Code [63]. In this system, behaviors are coded for content as they begin and end in real time, and the initiator and recipient of each behavior is also coded [64]. Conflict bouts were defined as an aversive behavior initiated by one family member towards another that was followed by a reciprocal aversive behavior by that family member. A bout was considered concluded once there were no aversive behaviors between the two family members for a period of 18 seconds.

The FPC contains 25 content codes for verbal, nonverbal, physical, and compliant behaviors. Rates per minute of aversive interactions were coded between the following dyads: (a) mothers and older siblings, (b) fathers and older siblings, (c) OYS boys and older siblings, and (d) between siblings (other than OYS boy and older sibling). Interobserver agreement within a ±4 second window on the initiation and termination of a bout was assessed using kappa. Agreement for initiation (0.78; range=0.68-0.83), termination (0.77; range=0.68-0.83), and instigator and content codes (0.74; range=0.64-0.81) were adequate [64]. Following the in-home observations, coders rated their overall impressions of conflict among family members.

Outcome: Sibling relationship quality. The Sibling Closeness Questionnaire [65,66] is a 72-item questionnaire about the closeness between siblings and was completed by older siblings and their mothers. Fathers also completed the SCQ; however, there were too few cases (N=17) for father-report data to be included in the analyses. The questionnaire was originally developed by Ginsberg et al. [65] for use in measuring closeness between friends, but was adapted for use with siblings in the present study consistent with past research [66].

Responses were recorded on a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree). Questionnaire items (for older siblings) had the stem "I would say that my brother" and included items such as: "Understands my feelings and concerns," "Shares innermost thoughts with me," and "Is someone to whom I can express my fears and worries." Construct validity has been established on this questionnaire [65,66].

The Conflict Tactics Scale [67] is a 16-item questionnaire that measures within-family conflict (both physical and psychological) and response to conflict during the past year. Older siblings completed this questionnaire twice (once for behaviors by older sibling towards younger brother and again for younger brother towards older sibling) resulting in 32 total responses.

Responses were recorded on a 5-point Likert scale (1=Never or Almost Never to 5=Always or Almost Always). Sample items included: "Argued heatedly but short of yelling," "Threatened to hit or throw something at the other," and "Threatened with a gun or knife." The CTS has demonstrated adequate construct validity and internal reliability [67]. Sibling relationship quality was operationally defined by these two measures.

Results

Creation of scales

The outcome measure for sibling relationships quality was factor analyzed with varimax rotation to create scales. Analyses on both the self- and mother-report of the SCQ yielded two factors: sibling intimacy and sibling conflict. Items on the two scales were nearly identical across self- and mother-report. The majority of items (63 for self-report and 65 for mother-report) loaded on sibling intimacy and the remaining items (9 items and 7 items, respectively) loaded on sibling conflict. The factors accounted for 53.5% and 58.4% of the variance on the self- and mother-report, respectively. Cronbach's alpha indicated that all four scales derived from the SCQ were internally consistent, self-report sibling intimacy α=0.99 and sibling conflict α=0.72, mother-report sibling intimacy α=0.99 and sibling conflict α=0.80. Internal consistency was only marginally improved when low loading items were removed so all items were retained.

Factor analysis on the CTS was initially done separately for items on behaviors from older sibling toward younger brother and for behaviors from younger brother to older sibling. However, the results were essentially the same when all 32 responses were analyzed together so they were collapsed. The factor analysis yielded three factors: reasoning, verbal or symbolic aggression, and physical force. These factors are consistent with previous factor analyses on the CTS reported by both Straus [67,68]. A total of 6 items loaded on the reasoning factor, 10 items on verbal or symbolic aggression, and 16 items on physical force. The factors accounted for 64.9% of the variance. The internal consistency was sufficient, α=0.87 for reasoning, α=0.90 for verbal or symbolic aggression, and α=0.96 for physical aggression. Internal consistency was only slightly improved when items with relatively lower factor loadings were removed so all items were retained.

Descriptive and distributional properties

Distributional properties of observational data and coder impressions are presented in Table 1 after two outliers were identified and winsorized to make distributions more normal. Given that observations are in standardized z-scores, their descriptive properties (M=0, SD=1.0) are not included in Table 1.

Observation/Rating	Skewness	Kurtosis
Sib-Sib Conflict	0.58	0.78
Sib-OYS Boy Conflict	0.26	-0.45
Sib-Parent Conflict	0.02	-0.37
Conflict Bouts	1.50	2.37
Coder Impressions	2.46	6.47
Note: Distributional properties after winsorization of outliers.		

Table 1: Distributional Properties of Family Conflict Observations and Coder Impressions.

Descriptive and distributional properties of the outcome scales are presented in Table 2. There are higher rates of positive (e.g., sibling intimacy) than negative characteristics (e.g., sibling conflict). The scales' distributional properties are largely normal; however, the

physical force scale has a positively skewed and kurtotic distribution due to low variability on the more severe items on this scale. For example, few siblings endorsed using a gun or knife on their younger brother.

Measure/Scale	M (SD)	Skewness	Kurtosis
Sibling Closeness Questionnaire			
Intimacy (Self)	3.60 (0.84)	-0.81	0.53
Conflict (Self)	2.95 (0.67)	0.13	0.01
Intimacy (Mom)	3.67 (0.82)	-0.49	0.47
Conflict (Mom)	2.95 (0.85)	0.28	-0.48
Conflict Tactics Scale			
Reasoning	3.24 (1.14)	-0.55	-0.43
Verbal/Symbolic Aggression	1.50 (0.69)	1.56	1.91
Physical Force	1.19 (0.58)	4.29	20.83
Note: M=mean; SD=standard deviation.			

Table 2: Scale Descriptive and Distributional Properties of Outcome Measures.

Creation of constructs

Standardized values of observed dyadic family conflict (parent-child and siblings) and coder impressions of conflict were combined to create a single family conflict construct. Specifically, rates of aversive behavior between dyads, rates per minute of conflict bouts, and coder impressions of conflict were modestly to strongly correlated (Table 3) so they were combined by taking the mean of their z-scores to create an overall family conflict construct. The relationships among observations, conflict bouts, and rater impressions were also shown to be internally consistent, α=0.77.

Observation	1	2	3	4	5
1. Sib-Sib Conflict	——				
2. Sib-OYS Boy Conflict	0.76**	——			
3. Sib-Parent Conflict	0.77**	0.49**	——		
4. Conflict Bouts	0.52**	0.21*	0.27**	——	
5. Coder Impressions	0.63**	0.19	0.20*	0.65**	——
*p < 0.05. **p <0.01.					

Table 3: Correlation Matrix for Family Conflict Observations and Coder Impressions.

Bivariate Pearson correlations (Table 4) were calculated to assess the relationship among the seven scales of sibling relationship quality in an effort to reduce the number of scales by creating aggregate constructs. The three positive sibling relationship quality scales (self-report sibling intimacy, mother-report sibling intimacy, and reasoning) were combined to make a positive sibling relationship quality construct. The scales were moderately correlated, with one exception (mother-report intimacy and reasoning, r=0.06), but for parsimony, the scales were determined to be sufficiently internally consistent (α=0.57) to create an aggregate construct. The four negative sibling relationship quality scales (self-report sibling conflict, mother-report sibling conflict, verbal or symbolic aggression, and physical force) were combined to create a negative sibling relationship quality construct. These scales were modestly to strongly correlated, with one exception (self-report conflict and physical force, r=0.07), and for parsimony, the scales were determined to be sufficiently internally reliable (α=0.64) to create an aggregate construct. Therefore, both positive and negative sibling relationship quality aggregate constructs were created for the analyses.

Scale	1	2	3	4	5	6	7
1. Intimacy (Self)	—						
2. Conflict (Self)	0.18	—					
3. Intimacy (Mom)	0.39**	0.02	—				
4. Conflict (Mom)	-0.37**	0.24**	0.03	—			
5. Reasoning	0.45**	-0.02	0.06	-0.19	—		
6. Verbal/Symbolic Agg.	-0.13	0.28**	0.02	0.37**	-0.08	—	
7. Physical Force	-0.08	0.07	0.02	0.27*	-0.15	0.66**	—
*p <0.05. **p < 0.01.							

Table 4: Correlation Matrix for Sibling Relationship Quality Scales.

Hypothesis testing: The Relation of Early Family Conflict to Later Relationship Quality

In order to test the hypothesis—that high levels of Time 1 family conflict would be predictive of poorer sibling relationship quality at Time 2—the family conflict construct was entered into SEM models predicting the relationship quality outcome constructs. Both older sibling age and sex were entered into each model as predictors of family conflict. The first model, using family conflict and sibling age and sex to predict positive sibling relationship quality (Figure 1), had good fit indices, X 2 (2)=1.46, p=0.48, CFI > 0.95, RMSEA < 0.001.

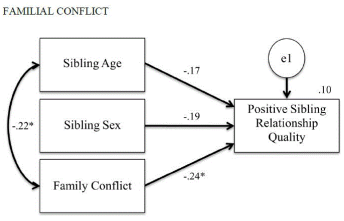

Figure 1: Model predicting positive sibling relationship quality. Correlations and total variance accounted for are reported. *p <0.05.

Family conflict was a significant negative predictor of positive sibling relationship quality, β=-0.24, p < 0.05, while neither age nor sex were significant predictors, β=-0.17, p > 0.05 and β=-0.19, p > 0.05, respectively. Overall, the Time 1 predictors accounted for 10% of the variance in Time 2 positive sibling relationship quality.

The second model, using family conflict and sibling age and sex to predict negative sibling relationship quality (Figure 2), also demonstrated good fit, X 2 (2)=1.36, p=0.51, CFI > 0.95, RMSEA <0.001. Family conflict was a significant predictor of negative sibling relationship quality, β=0.31, p < 0.01, while again neither age nor sex were significant predictors, β=0.19, p > .05 and β=0.07, p > 0.05, respectively. This model predicted a total of 11% of the variance in Time 2 negative sibling relationship quality.

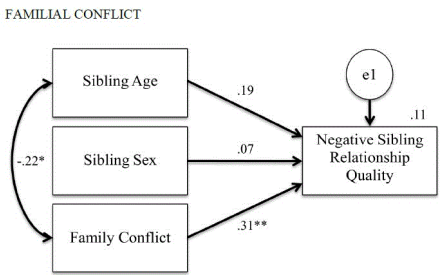

Figure 2: Model predicting negative sibling relationship quality. Correlations and total variance accounted for are reported. *p < 0.05. ** p < 0.01.

Discussion

This study assessed whether exposure to and involvement in family conflict during early adolescence predicts poorer interpersonal relationship quality between siblings in young adulthood. This hypothesis was supported. Family conflict during early adolescence predicted both positive and negative sibling relationship quality during young adulthood in the hypothesized direction; that is, more conflict was associated with poorer relationship quality. In short, family conflict was predictive of poorer relationship quality with siblings a decade later.

The finding that family conflict during early adolescence is a significant predictor of sibling relationship quality during young adulthood, for both males and females and regardless of the age at which exposure to family conflict exposure occurred during the early adolescent years, is congruent with Bandura's [32,33] social learning theory. This theory maintains that behaviors can be learned vicariously by watching and imitating others in addition to learning that occurs through shaping by direct experience with environmental contingencies, such as socially-derived antecedents and consequences. The sustained temporal relationship between family conflict in early adolescence and conflictual sibling relationships 10 years later implies that the amount and severity of familial conflict observed and experienced by youth is carried over into sibling relationships during young adulthood. This is consistent with previous research [59,60] suggesting that observing and experiencing familial conflict may disrupt the ability to form healthy interpersonal relationships later in development, providing evidence for the position that the family serves as a powerful model for these relationships. This is, in turn, congruent with the factors that increase the likelihood for imitating a model (i.e., power, nurturance, and similarity) outlined by Mischel et al. [35] insofar as each of these features can be applied to the family (described above).

Furthermore, early conflict may also be maintained via direct contingency-shaped learning in a way that persists over time within families. An aggressive older sibling, for instance, may often get his or her way when interacting with a younger sibling by using coercion and intimidation, which reinforces such interpersonal strategies and increases the likelihood that these behaviors will be maintained. Additionally, the endurance of these prospective relationships may reflect the obligatory, encompassing, and long lasting nature of family relationships. While the factors identified by Mischel et al. [35] increase the likelihood of imitation, it appears that these features, which are also congruent with social learning theory, result in regular, consistent, and salient learning trials that are both direct and observational in nature. Effects that are seen over a decade—as demonstrated here—are impressive, but the profound and lasting influence of family experiences are consistent given the unique characteristics of family relationships. It is important to note, however, that the present findings suggest an association between family conflict and young adult relationships with siblings specifically. Additional research would be needed in order to determine whether such patterns are also apparent in other familial relationships, such as between young adults and their parents.

These findings have implications for intervention. Most notably, interventions aimed at reducing family conflict by promoting prosocial communication and conflict resolution strategies, for example, may result in lasting improvements in sibling relationships. Promoting supportive relationships among siblings may be an especially powerful catalyst for positive outcomes that resonate across development insofar as sibling relationships tend to be the longest lasting relative to all other relationship types [9-11]. Another feature that makes sibling relationships unique and a promising target for intervention is their horizontal structure, which means siblings relatively close in age are faced with challenges (e.g., increased autonomy) at somewhat similar times. By fostering positive relationships, older siblings may be more inclined to help younger siblings with developmental challenges that they have already faced.

The present study had several strengths, including a longitudinal design as well as the use of multiple methods and reporters. The benefits of longitudinal designs are well known, such as ability to track change in the same individuals over time, control of cohort effects that may influence outcomes of cross-sectional designs, and the ability to make stronger inferences about the directionality of effects. The use of multiple methods for data collection controls for method variance [69] and this is an especially salient strength insofar as observations of familial conflict took place in the natural home environment. Likewise, the use of multiple reporters for sibling relationship quality increases construct validity. Another strength of the study includes the measurement of conflict between multiple family dyads, as previous research on the outcomes of familial conflict typically focused on single dyads (e.g., parental) as predictors rather than assessing the family in a more systemic way. This is especially relevant given that observational, direct, and contingency-based learning likely occurs between all family members and, in addition, most developmental psychologists and contemporary family therapies view the family as a complex system of interacting and reciprocal individuals [70-72].

Naturally, this study is not without limitations. Given that adolescence is often marked by a greater emphasis placed on peers as social support systems [73-75], one limitation is that data on peer relationships during early adolescence were not available as a predictor of sibling relationship quality in young adulthood. However, some research suggests that parents play a stronger role in socializing their adolescent children than peers [76]. Another limitation is the relatively

homogenous demographic characteristics of sample participants. Although the sample was comprised of low-income families with children at-risk for delinquency, the majority of participants were of European descent. Therefore, conclusions about the generalizability of the present findings to both low-risk populations and minorities should be done cautiously.

Future research should aim to address these limitations, using the methodological refinements suggested above. Additionally, future research should examine whether specific types of familial conflict (e.g., parent-child vs. sibling-sibling) has unique effects on specific relationships later in development, such as, for example, whether conflict with one's parents is a stronger predictor of relationship quality with that individual's own children than other types of conflict. Future longitudinal studies should also follow individuals past emerging or young adulthood into the middle and late adult years to examine whether the influence of early family conflict on sibling relationships persists into later life. It would also be interesting to include friendship quality in adulthood as an outcome variable in concert with qualities of sibling relationships. In addition to predicting the quality of these relationships from family conflict, such a design could also examine the potential buffering effects that adult friendships may have between family conflict in youth and characteristics of adult relationships, as research suggests such friendship networks improve intimate partner relationships in adulthood [77,78].

In conclusion, the present study examined the influence of familial conflict during early adolescence on sibling relationship quality in young adulthood using an at-risk sample. Current research examining this influence has a number of limitations, such as the use of retrospective reports of family conflict and assessing conflict between dyads of specific family members whereas more systemic family conflict may be important. The present study addressed some of these limitations. Findings indicated that earlier family conflict was predictive of poorer sibling relationships later in development, suggesting that such conflict may continue from early adolescence to young adulthood. This study illustrates the importance of the family system in socializing children and the lasting impact family context can have on later development. Fortunately, this suggests that family-based interventions aimed at improving the familial environment may also have equally lasting and far-reaching effects on the quality of later relationships.

References

1. McHale SM, Updegraff KA, Whiteman SD (2012) Sibling Relationships and Influences in Childhood and Adolescence. J Marriage Fam 74: 913-930.
2. Whiteman SD, McHale SM, Crouter AC (2007) Explaining sibling similarities: Perceptions of sibling influences. Journal of Youth and Adolescence 36: 963-972.
3. Carlo G, Knight G, McGinley M, Hayes R (2011) The Roles of Parental inductions, moral emotions, and moral cognitions in prosocial tendencies among Mexican American and European American early adolescents. Journal of Early Adolescence 31: 757-781.
4. Bender HL, Allen JP, McElhaney KB, Antonishak J, Moore CM, et al. (2007) Use of harsh physical discipline and developmental outcomes in adolescence. Dev Psychopathol 19: 227-242.
5. Gershoff ET (2002) Corporal punishment by parents and associated child behaviors and experiences: a meta-analytic and theoretical review. Psychol Bull 128: 539-579.
6. Hawkins JD, Catalano RF, Miller JY (1992) Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. Psychol Bull 112: 64-105.
7. Hernandez DJ (1997) Child development and the social demography of childhood. Child Development 68: 149-169.
8. Milevsky A (2011) Sibling relationships in childhood and adolescence: Predictors and outcomes. New York, NY: Columbia University Press.
9. Noller P (2005) Sibling relationships in adolescence: Learning and growing together. Personal Relationships 12: 1-22.
10. Pulakos J (1990) Correlations between family environment and relationships of young adult siblings. Psychological Reports 67: 1283-1286.
11. Volkom MV (2006) Sibling relationships in middle and older adulthood: A review of the literature. Marriage & Family Review 40: 151-170.
12. Lam CB, McHale SM, Crouter AC (2014) Time with peers from middle childhood to late adolescence: developmental course and adjustment correlates. Child Dev 85: 1677-1693.
13. Maxwell KA (2002) Friends: The role of peer influence across adolescent risk behaviors. Journal of Youth and Adolescence 31: 267-277.
14. Larson R, Richards MH (1994) Divergent realities: The emotional lives of mothers, fathers, and adolescents. New York, NY: Basic Books.
15. Sanders R (2004) Sibling relationships: Theory and issues for practice. Basingstoke, Hampshire: Palgrave Macmillan.
16. Buist KL, DekoviÄ‡ M, Prinzie P (2013) Sibling relationship quality and psychopathology of children and adolescents: a meta-analysis. Clin Psychol Rev 33: 97-106.
17. Gass K, Jenkins J, Dunn J (2007) Are sibling relationships protective? A longitudinal study. J Child Psychol Psychiatry 48: 167-175.
18. Bouchey HA, Shoulberg EK, Jodl KM, Eccles JS (2010) Longitudinal links between older sibling features and younger siblings' academic adjustment during early adolescence. J Educ Psychol 102: 197-211.
19. Jensen AC, McHale SM (2015) What makes siblings different? The development of sibling differences in academic achievement and interests. J Fam Psychol 29: 469-478.
20. Lam CB, Solmeyer AR, McHale SM (2012) Sibling relationships and empathy across the transition to adolescence. J Youth Adolesc 41: 1657-1670.
21. Tucker CJ, Updegraff KA, McHale SM, Crouter AC (1999) Older siblings as socializers of younger siblings' empathy. Journal of Early Adolescence 19: 176-198.
22. Killoren SE, Wheeler LA, Updegraff KA, Rodriguez de Jésus SA, McHale SM (2015) Longitudinal association among parental acceptance, familism values, and sibling intimacy in Mexican-origin families. Fam Process 54: 217-231.
23. McGue M, Sharma A, Benson P (1996) Parent and sibling influences on adolescent alcohol use and misuse: evidence from a US adoption cohort. J Stud Alcohol 57: 8-18.
24. Samek DR, McGue M, Keyes M, Iacono WG (2014) Sibling facilitation mediates the association between older and younger sibling alcohol use in late adolescence. Journal of Research on Adolescence.
25. Scholte RH, Poelen EA, Willemsen G, Boomsma DI, Engels RC (2008) Relative risks of adolescent and young adult alcohol use: the role of drinking fathers, mothers, siblings, and friends. Addict Behav 33: 1-14.
26. Slomkowski C, Rende R, Novak S, Lloyd-Richardson E, Niaura R (2005) Sibling effects on smoking in adolescence: evidence for social influence from a genetically informative design. Addiction 100: 430-438.
27. McHale SM, Bissell J, Kim JY (2009) Sibling relationship, family, and genetic factors in sibling similarity in sexual risk. J Fam Psychol 23: 562-572.
28. Widmier E (1997) Influence of older siblings on initiation of sexual intercourse. Journal of Marriage and the Family 59: 928-938.
29. Bank L, Burraston B, Snyder J (2004) Sibling conflict and ineffective parenting as predictors of adolescent boys' antisocial behavior and peer difficulties: Additive and interactional effects. Journal of Research on Adolescence 14: 99-125.

30. Fagan AA, Najman JM (2003) Sibling influences on adolescent delinquent behaviour: an Australian longitudinal study. J Adolesc 26: 547-559.
31. Shortt JW, Capaldi DM, Dishion TJ, Bank L, Owen LD (2003) The role of adolescent friends, romantic partners, and siblings in the emergence of the adult antisocial lifestyle. J Fam Psychol 17: 521-533.
32. Bandura A (1971) Social learning theory. New York, NY: General Learning Press.
33. Bandura A (1977) Social learning theory. Englewood Cliffs, NJ: Prentice Hall.
34. Grusec JE (1992) Social learning theory and developmental psychology: The legacies of Robert Sears and Albert Bandura. Developmental Psychology 28: 776-786.
35. Mischel W (1966) A social learning view of sex differences in behavior. In EE Maccoby (Edn.), The development of sex differences pp: 57-81.
36. Abar C, Abar B, Turrisi R (2009) The impact of parental modeling and permissibility on alcohol use and experienced negative drinking consequences in college. Addict Behav 34: 542-547.
37. Rhoades GK, Stanley SM, Markman HJ, Ragan EP (2012) Parents' Marital Status, Conflict, and Role Modeling: Links With Adult Romantic Relationship Quality. J Divorce Remarriage 53: 348-367.
38. Bunaciu L, Leen-Feldner EW, Blumenthal H, Knapp AA, Badour CL, et al. (2014) An experimental test of the effects of parental modeling on panic-relevant escape and avoidance among early adolescents. Behav Ther 45: 517-529.
39. Burstein M, Ginsburg GS (2010) The effect of parental modeling of anxious behaviors and cognitions in school-aged children: an experimental pilot study. Behav Res Ther 48: 506-515.
40. East PL (1998) Impact of adolescent childbearing on families and younger siblings: Effects that increase younger siblings' risk for early pregnancy. Applied Developmental Science 2: 62-74.
41. Bard DE, Rodgers JL (2003) Sibling influence on smoking behavior: A within-family look at explanations for a birth-order effect. Journal of Applied Social Psychology 3: 1773-1795.
42. Slomkowski C, Rende R, Conger KJ, Simons RL, Conger RD (2001) Sisters, brothers, and delinquency: evaluating social influence during early and middle adolescence. Child Dev 72: 271-283.
43. Snyder J, Bank L, Burraston B (2005) The consequences of antisocial behavior in older male siblings for younger brothers and sisters. J Fam Psychol 19: 643-653.
44. Stormshak EA, Bellanti CJ, Bierman KL (1996) The quality of sibling relationships and the development of social competence and behavioral control in aggressive children. Developmental Psychology 32: 79-89.
45. Compton K, Snyder J, Schrepferman L, Bank L, Shortt JW (2003) The contribution of parents and siblings to antisocial and depressive behavior in adolescents: a double jeopardy coercion model. Dev Psychopathol 15: 163-182.
46. Solmeyer AR, McHale SM, Crouter AC (2014) Longitudinal associations between sibling relationship qualities and risky behavior across adolescence. Dev Psychol 50: 600-610.
47. Lam CB, Solmeyer AR, McHale SM (2012) Sibling differences in parent-child conflict and risky behavior: a three-wave longitudinal study. J Fam Psychol 26: 523-531.
48. Richmond MK, Stocker CM (2008) Longitudinal associations between parents' hostility and siblings' externalizing behavior in the context of marital discord. J Fam Psychol 22: 231-240.
49. Barrera M, Biglan A, Ary D, Li F (2001) Replication of a problem model with American Indian, Hispanic, and Caucasian youth. Journal of Early Adolescence 21: 133-157.
50. Padilla-Walker LM, Harper JM, Jensen AC (2010) Self-regulation as a mediator between sibling relationship quality and early adolescents' positive and negative outcomes. J Fam Psychol 24: 419-428.
51. Walther CA, Cheong J, Molina BS, Pelham WE Jr, Wymbs BT, et al. (2012) Substance use and delinquency among adolescents with childhood ADHD: the protective role of parenting. Psychol Addict Behav 26: 585-598.
52. Rhoades KA (2008) Children's responses to interparental conflict: a meta-analysis of their associations with child adjustment. Child Dev 79: 1942-1956.
53. Young L, Ehrenbery MF (2007) Siblings, parenting, conflict, and divorce: Do young adults' perceptions of past family experiences predict their present adjustment? Journal of Divorce and Remarriage 47: 67-85.
54. Stocker CM, Burwell RA, Briggs ML (2002) Sibling conflict in middle childhood predicts children's adjustment in early adolescence. J Fam Psychol 16: 50-57.
55. Kim J, McHale SM, Crouter AC, Osgood DW (2007) Longitudinal linkages between sibling relationships and adjustment from middle childhood through adolescence. Dev Psychol 43: 960-973.
56. Amato PR, DeBoer DD (2001) The transmission of marital instability across generations: Relationship skills or commitment to marriage? Journal of Marriage and Family, 63, 1038-1051.
57. Ahmed A, Gohlke H (2006) Multiscale modeling of macromolecular conformational changes combining concepts from rigidity and elastic network theory. Proteins 63: 1038-1051.
58. Segrin C, Taylor ME, Altman J (2005) Social cognitive mediators and relational outcomes associated with parental divorce. Journal of Social and Personal Relationships 22: 361-377.
59. Story LB, Karney BR, Lawrence E, Bradbury TN (2004) Interpersonal mediators in the intergenerational transmission of marital dysfunction. J Fam Psychol 18: 519-529.
60. Roth KE, Harkins DA, Eng L A (2014) Parental conflict during divorce as an indicator of adjustment and future relationships: A retrospective sibling study. Journal of Divorce and Remarriage 55: 117-138.
61. Doughty SE, McHale SM, Feinberg ME (2015) Sibling experiences as predictors of romantic relationship qualities in adolescence. J Fam Issues 36: 589-608.
62. Capaldi DM, Patterson GR (1987) Psychometric properties of fourteen latent constructs from the Oregon Youth Study. New York: Springer-Verlag.
63. Patterson GR, Reid JB, Dishion TJ (1992) A social interactional approach. Antisocial boys. Eugene, OR: Castalia.
64. Dishion T, Gardner K, Patterson G, Reid J, Spyrou S, et al. (1983) The family process code: A multidimensional system for observing family interaction. Unpublished manuscript. Eugene: Oregon Social Learning Center.
65. Snyder J, Edwards P, McGraw K, Kilgore K, Holton A (1994) Escalation and reinforcement in mother-child conflict: Social processes associated with the development of physical aggression. Development and Psychopathology 6: 305-321.
66. Ginsberg D, Gottman JM (1986) Conversations of college roommates: Similarities and differences in male and female relationships.
67. Shortt JW, Gottman JM (1997) Closeness in young adult sibling relationships: Affective and physiological processes. Social Development 6: 142-164.
68. Straus MA (1979) Measuring intrafamily conflict and violence: The Conflict Tactics (CT) Scales. Journal of Marriage and Family 41: 75-88.
69. Jorgensen SR (1977) Social class heterogamy, status striving, and perceptions of marital conflict: A partial replication and revision of Pearlin's contingency hypothesis. Journal of Marriage and Family 39: 653-661.
70. Cone JD (1979) Confounded comparisons in triple response mode assessment research. Behavioral Assessment 1: 85-95.
71. Cornett N, Bratton SC (2014) Examining the impact of child parent relationship therapy (CPRT) on family functioning. J Marital Fam Ther 40: 302-318.
72. Olson DH, Gorall DM (2003) Circumplex model of marital and family systems. In F. Walsh (3rd Edn.), Normal family processes pp: 514-547.
73. Riina EM, McHale SM (2014) Bidirectional influences between dimensions of coparenting and adolescent adjustment. J Youth Adolesc 43: 257-269.

74. Masten CL, Juvonen J, Spatzier A (2009) Relative importance of parents and peers: Differences in academic and social behaviors at three grade levels spanning late childhood and early adolescence. Journal of Early Adolescence 29: 773-779.

75. Wagner H (1971) The increasing importance of the peer group during adolescence. Adolescence 6: 53-58.

76. Pinquart M, Silbereisen RK (2002) Changes in adolescents' and mothers' autonomy and connectedness in conflict discussions: an observation study. J Adolesc 25: 509-522.

77. Greenberg MT, Siegel JM, Leitch CJ (1983) The nature and importance of attachment relationships to parents and peers during adolescence. J Youth Adolesc 12: 373-386.

78. Sprecher S, Felmlee D (1992) The influence of parents and friends on the quality and stability of romantic relationships: A three-wave longitudinal investigation. Journal of Marriage and Family 54: 888-900.