

Risk and Protective Effects of Sibling Relationships among African American Adolescents

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## Risk and Protective Effects of Sibling Relationships Among African American Adolescents

*This study investigated associations between sibling relationships and adjustment among 179 African American adolescent siblings (controlling for family factors) and tested moderating effects of familism values and birth order. Two-level random intercept models revealed that familism values moderated sibling relationship-adjustment linkages, suggesting that youth who reported both strong familism values and harmonious sibling relationships showed the most positive outcomes. These effects were more consistent for older than for younger siblings. Findings highlight the role of cultural values and birth order in shaping sibling influence processes.*

Siblings are a central part of adolescents' lives. In the mid-1990s, nearly 90% of youth in the United States lived with a sibling (Hernandez, 1997), and a growing body of evidence suggests that sibling relationships may have important implications for youth adjustment (Branje, van Lieshout, van Aken, & Haselager, 2004; Kim, McHale, Crouter, & Osgood, 2007; Stocker,

Burwell, & Briggs, 2002). Understanding sibling influence processes is important because the sibling relationship is a clear target for interventions and may be a useful entry point for inducing positive change in youths' behavior and adjustment (e.g., Kramer, 2004). Most research on the risk and protective effects of sibling relationships, however, has been conducted with European and European American populations. We know little about sibling relationships among African Americans, a cultural group with generally strong family values (Hill, 2007; Sudarkasa, 1980) that may be particularly well served by programs that target sibling relationships. In addition, it is important to examine the role of contextual factors, such as birth order and cultural values, in shaping sibling influence processes (Updegraff, McHale, Whiteman, Thayer, & Delgado, 2005). In this study, we investigated the links between sibling warmth, relational aggression, and hostility and both positive and negative youth adjustment in a sample of African American adolescents. We also examined whether these links were conditioned by youth's familism values and birth order.

### *Sibling Relationship Qualities and Adolescent Adjustment*

A comprehensive view of psychosocial adjustment in adolescence includes attention to both positive and negative domains of adjustment. Past research has shown that risky behavior (e.g., delinquency, substance use) and internalizing symptoms (e.g., depression) are two key

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dimensions of adjustment problems in adolescence and that both kinds of problems tend to increase during this developmental period (Arnett, 1999). Less work has investigated positive aspects of adjustment, but academic outcomes have been identified as a key domain of competence in adolescence (Maddox & Prinz, 2003; Masten et al., 1995). This study focused on two indicators of adolescent adjustment problems (depressive symptoms and risky behavior) and two indicators of competence (academic achievement and school bonding).

*Sibling negativity as a risk factor.* Family relationships are a major force in shaping adolescent adjustment (Reese, Vera, Simon, & Ikeda, 2000), and sisters and brothers have the potential to influence one another in many ways. In general, research on the links between sibling relationship qualities and psychosocial adjustment is consistent with a risk/protective framework, which suggests that family dynamics can serve as both risk and protective factors (Reese et al.; Rutter, 1987). According to social learning theory (Bandura, 1977), a sibling relationship characterized by high levels of conflict and rivalry may result in adjustment problems through mechanisms such as modeling and reinforcement of maladaptive behaviors. Empirical research on European American and African American adolescents has demonstrated that sibling conflict and control are risk factors for anxiety, depressive symptoms, and delinquent behavior (East & Khoo, 2005; Kim et al., 2007; McHale, Whiteman, Kim, & Crouter, 2007; Stocker et al., 2002).

Past research on sibling negativity has focused almost exclusively on more conspicuous behaviors in the context of dyadic exchanges, such as conflict and displays of hostility. Research on other kinds of close relationships, however, has revealed that relational aggression—such as exclusion and social alienation—is another important relationship dimension that is a risk factor for both peer rejection and internalizing problems (Crick et al., 2001). Relational aggression is distinct from overt hostility and conflict (Updegraff, Thayer, Whiteman, Denning, & McHale, 2005), and some work has shown that siblings engage in relational aggression with one another more often than in verbal or physical aggression (Crick et al.). Importantly, sibling hostility and

relational aggression may have different implications for adjustment. Hostile behaviors tend to be explicit and are typically directed at only the target individual, whereas relational aggression entails indirect and manipulative processes and its influence extends to others in the victim's social network. In this way, one sibling may use relational aggression to limit the other's access to peer relationships, which could contribute to feelings of loneliness or association with deviant peers. Relational aggression may have powerful consequences during adolescence, when forming intimate peer relationships is a key developmental task. The current study extended previous work by examining both sibling relational aggression and hostility as potential risk factors for poor adjustment.

*Sibling positivity as a protective factor.* Positive dimensions of sibling relationships, such as support and emotional intimacy, may serve as protective factors. According to Rutter's (1987) theory on resilience, protective factors can act as buffers against the negative consequences of exposure to a risk factor and/or they can promote healthy adjustment by establishing and maintaining self-esteem and self-efficacy. Studies of European (Branje et al., 2004; Pike, Coldwell, & Dunn, 2005) and European American (Kim et al., 2007) families have shown that high levels of sibling positivity were linked with fewer externalizing and internalizing problems in childhood and adolescence (Pike et al. reported this finding only among older siblings). Sibling positivity may also promote positive peer competence, as reported by Kim et al.

An important domain of positive adjustment is academic outcomes, particularly for African American adolescents who have consistently lower achievement than White students (Paik & Walberg, 2007). Warm sibling relationships may enhance academic outcomes by instilling a sense of self-worth and competence. The few empirical studies on the links between sibling relationship qualities and academic outcomes have produced mixed results. Widmer and Weiss (2000) found that supportive sibling relationships were associated with stronger school engagement but only among children who viewed their older siblings as successful. Among ethnically diverse adolescents, Milevsky and Levitt (2005) found that support from a brother was negatively associated with teacher-reported behavior problems for Hispanics.

Similarly, Crosnoe and Elder (2004) showed that more sibling support was linked to fewer academic problems (e.g., being expelled), but these findings emerged only among African American students. School bonding is another academic outcome that has been linked to lower substance use and delinquency and higher self-esteem among adolescents. Broadly defined, school bonding is the attachment or sense of belonging a student feels toward his or her school and teachers (see Maddox & Prinz, 2003, for a review). To date, no studies have examined the role of sibling relationships in school bonding. The available research on academic outcomes suggests that positive sibling relationships are linked with better academic adjustment, particularly among minority youth. Our study added to the literature by considering how sibling relationships were linked to both academic achievement and school bonding.

*Family context.* An important but understudied issue in sibling influence research involves how contextual factors, such as other family relationships and family background characteristics, may affect sibling relationship-adjustment linkages. For example, birth order appears to be an important part of sibling influence processes (Sulloway, 1996; Whiteman, McHale, & Crouter, 2003). Social learning theory suggests that, because of their age and higher status, older siblings are more salient models for their younger siblings than the reverse, and thus, older siblings have a greater potential impact on their younger siblings (Bandura, 1977). Indeed, much of the literature has focused on younger siblings' outcomes (e.g., East & Khoo, 2005; Widmer & Weiss, 2000). Contrary to these theoretical assumptions, some studies that have used within-family comparisons have found stronger links between sibling relationships and outcomes for *older* siblings (Branje et al., 2004; Pike et al., 2005), but others have found no birth-order differences (Kim et al., 2007). In the present study, we examined the influence of birth order via multilevel modeling (MLM) to directly compare sibling influence processes for older and younger siblings from the same family.

Another contextual factor that likely affects sibling relationships and adjustment is parent-child relationship quality. For example, a hostile parent-child relationship may act as a third variable that leads to both negative sibling

interactions and poor adjustment. In this situation, associations between sibling relationships and adjustment may be because of the parent-child relationship. Other family characteristics, including socioeconomic status and family structure, may also be potential confounds of sibling influence processes (e.g., O'Connor, Dunn, Jenkins, Pickering, & Rasbash, 2001). To test the *unique* influence of the sibling relationship on adjustment, contextual factors should be controlled. With a few exceptions (e.g., Branje et al., 2004; Kim et al., 2007; Stocker et al., 2002), sibling research has not taken potentially confounding family context factors into account.

In light of previous research, our first broad goal was to explore the links between three sibling relationship qualities (warmth, relational aggression, and hostility) and four domains of youth adjustment (depressive symptoms, risky behavior, school bonding, and academic achievement) in a sample of African American adolescents, controlling for family structure, parental education, gender, and parental warmth. We sought to replicate and extend previous research on European American youth, testing the prediction that sibling warmth would be protective and that relational aggression and hostility would be risk factors for depressive symptoms and risky behavior. We also aimed to examine the hypotheses that sibling warmth would serve as a protective factor and relational aggression and hostility would be risk factors for school bonding and achievement. Our second goal was to investigate birth order as a moderator of sibling relationship-adjustment linkages. Although prior findings on birth order have been mixed, on the basis of the tenets of social learning theory, we tested the prediction that the associations would be stronger for younger than for older siblings.

#### *Familism Values and Adolescent Adjustment*

Because most sibling research has been limited to European and European American families, we know little about how the processes linking sibling relationship qualities and youths' adjustment operate in other racial/ethnic groups. Importantly, much of what we know about minority families has come from disadvantaged (e.g., low-income populations, single-parent families) African American samples, and research on family processes in normative samples is sorely needed (Hill, Murry, & Anderson,

2005). Because of the experiences of discrimination, racism, and social disadvantage faced by minority groups living in the United States, investigating potential risk and protective factors among African American youth has important practical implications.

The few studies that have examined African American samples have reported links between sibling relationship qualities and adjustment that are generally consistent with findings for European Americans (East & Khoo, 2005; McHale et al., 2007). At the same time, cultural values may play a significant and unique role in minority families. A cultural-ecological perspective (Spencer, 1995) purports that cultural forces shape beliefs, values, and behaviors, and also may influence how individuals experience family dynamics and processes. From this perspective, sibling relationships may not have uniform implications for adolescents' adjustment; rather, the effects may vary as a function of youths' cultural values. Specifically, strong familism values may function as an added protective factor against poor adjustment or a buffer against the harmful effects of sibling negativity.

Research on African American families suggests a number of characteristics that distinguish them from the majority culture, such as flexible family roles and high levels of respect for parents and elders (Hill, 2007). Here, we focus on "familism values" that reflect the interdependence among family members, including familial support, obligation, and solidarity. Although this construct originated in the study of Mexican American families, it is also relevant for African American culture and resonates with the principles of respect, responsibility, and reciprocity, which are rooted in indigenous African ideologies and which continue to govern African American families today (Sudarkasa, 1980). In a sample of diverse adults, Gaines et al. (1997) demonstrated that African American and Hispanic adults viewed familism values as significantly more important than their European American counterparts, though these values were endorsed to some extent by all three groups. Furthermore, Herman, Ostrander, and Tucker (2007) found that family cohesion was a protective factor against depression for African American (but not European American) adolescents. Familism values may facilitate resilience in African American youth and protect them against negative outcomes (Hill), and these values are

a strength of African American families upon which interventions can build.

Most research on familism values, however, has focused on between-groups comparisons and offers little insight into the implications of *within-culture* variation in familism values. How are family dynamics, such as sibling relationships, shaped by the degree of importance adolescents place on family? Such questions can be best addressed through ethnic-homogenous research designs, which allow researchers to examine the diversity of experiences *within* a particular racial/ethnic group (Hill et al., 2005). The present study used such a design to explore the variations in familism values within a sample of African American families.

Given our concern with better understanding the implications of African American culture, our third research goal was to test whether the links between adolescents' sibling relationship qualities and adjustment varied as a function of youths' familism values. On the basis of past research on the mechanisms of risk and protective factors (Pollard, Hawkins, & Arthur, 1999; Rutter, 1987), we expected to find two moderation patterns. First, Pollard et al. have shown that for some outcomes, an increase in the number of protective factors was associated with a decrease in the prevalence of poor adjustment. Because researchers have conceptualized both positive sibling relationships and familism values as protective factors, we expected that the combination of high familism values and a warm sibling relationship would act together to produce a "multiplicative protective" effect against poor adjustment. Second, we predicted a potential "buffering effect," whereby a strong sense of familism might lessen the negative effects of sibling relational aggression and hostility (Rutter). For example, youth who feel that families should stick together and support one another under all circumstances may be able to better cope with sibling negativity than youth who do not have strong familism values.

Birth order is also relevant here, in that familism values and sibling relationship qualities may interact differently for older and younger siblings because of their differential status within the family. Consistent with a social learning perspective on birth-order processes, we hypothesized that the interacting effects of sibling relationship qualities and familism values would be stronger for younger than older siblings. Thus, our fourth research goal was



to test the three-way interactions between birth order, familism values, and sibling relationship quality as predictors of youths' adjustment.

### *Study Goals*

In sum, the goals of the present study were: (a) to explore the linkages between sibling warmth, relational aggression, and hostility and depressive symptoms, risky behavior, school bonding, and academic achievement among African American adolescents, after controlling for family structure, parental education, gender, and parental warmth; (b) to test for birth-order differences in the association between sibling relationships and adjustment; (c) to examine whether youths' endorsement of familism values strengthened or weakened the sibling relationship-adjustment linkages; and (d) to test for birth-order differences in moderation effects.

## METHOD

### *Participants*

The data came from mothers, fathers, and two offspring in 179 African American families participating in the third year of a short-term longitudinal study. Given the goals of the larger investigation, a study of family gender socialization (McHale et al., 2007), we targeted parents who were living together and raising at least two offspring in middle childhood and adolescence. Participants came from two contiguous urban centers on the Eastern Seaboard with substantial African American populations. Roughly half of the families were enrolled by African American recruiters who lived in the target communities and distributed information about the project at youth activities in local churches and community groups. In addition, we obtained names and addresses of African American students in grades 4 through 7 from a marketing firm. These families were sent letters describing the project and were asked to return a postcard or call a toll free number if they were interested in participating.

In Year 1 of the study, the sample included 202 families. Over the course of 3 years, 11 families declined to participate (an attrition rate of 5%). Data from seven families in which the parental figures were not romantically involved (e.g., a biological mother and her brother who functioned as a father figure) and five families

with older siblings who declined participation were excluded from the analysis. The final sample for the current study was 179 families.

In Year 3 of the study, 80% of mothers and fathers were married to one another. Of the remaining couples, 12% were divorced or separated and 8% were cohabiting. In 94% of the families, both parents self-identified as African American (in 11 families, only one parent identified as African American); all target adolescents self-identified as African American. In 80% of the families, siblings were fully biologically related. Of the participating parents, 96% of mothers and 80% of fathers were the biological parents of the target adolescents.

The annual family income in this sample ranged from \$22,800 to \$685,000 with a mean of \$95,554 ( $SD = \$75,372$ ; four families did not report income). On average, fathers had completed 14.32 years of education ( $SD = 2.32$ ) and mothers, 14.77 years ( $SD = 1.83$ ). Of the parents, 83% of mothers and 91% of fathers were employed. The number of offspring ranged from 2 to 8; 92% of families included four or fewer children ( $M = 2.62$ ,  $SD = 1.32$ ). Target older siblings averaged 16.22 years ( $SD = 1.96$ , range = 12.04–21.27 years) and younger siblings, 12.58 years ( $SD = 1.12$ , range = 9.87–15.23 years), with a mean age difference of 3.64 years ( $SD = 1.91$ ). Nearly all (98%) pairs were consecutive in birth order and the majority (75%) were first- and second-borns. Gender dyad composition was evenly distributed, with 46 sister-sister, 41 sister-brother, 50 brother-sister, and 42 brother-brother pairs.

### *Procedures*

Mothers, fathers, and two target siblings (a preadolescent and his/her next oldest sister or brother) were interviewed annually in their homes by two interviewers, nearly all of whom were African American women who also resided in the community. Each family member was interviewed individually about his or her family relationships and personal well-being. Some measures were presented orally and others were completed through a paper and pencil format. All questions were presented orally to children under the age of 13 and to participants with reading difficulties. Interviews lasted between 1 and 3 hours, and families were sent a \$200 honorarium upon completion of their interviews.

### Measures

Means, standard deviations, reliabilities, and ranges for study variables are shown in Table 1.

*Sibling relationship qualities.* Three dimensions of the sibling relationship were assessed: warmth, relational aggression, and hostility. Siblings used a 5-point Likert scale (1 = *never or hardly ever*, 5 = *always*) to indicate how often they engaged in the behaviors described by each item; responses were averaged. We used the Sibling Relationship Inventory (Stocker & McHale, 1992) to assess *warmth* (seven items, e.g., “How often do you share secrets with your sister/brother?”) and *hostility* (five items, e.g., “How often does your sister/brother get mad at or angry with you?”). Five items from the Sibling Qualities Measure (O’Brien & Crick, 1995) measured *relational aggression* (e.g., “How often does your sister/brother tell your secrets to other kids when she/he is mad at you?”). A principal components analysis confirmed that the three relationship qualities were distinct dimensions in our African American sample (eigenvalues = 5.05, 2.85, and 1.26, respectively). Older and younger sibling reports of sibling relationship quality were moderately correlated, ranging from .23 to .46,  $p < .01$ .

*Adolescent adjustment.* Depressive symptoms were measured using the 10-item version of the Children’s Depression Inventory (Kovacs, 1981). Youth chose one of three statements that best described their feelings over the past week with higher average scores indicating more depressive symptoms. Youth in the sixth grade and older used a 4-point Likert scale (1 = *never*, 4 = *more than 10 times*) to respond to an 18-item *risky behavior* measure (Eccles & Barber, 1990) indicating their frequency of participation in each activity in the past year (e.g., “How many times did you “smoke cigarettes?”); responses were averaged. Natural logarithmic transformations were applied to the depressive symptoms and risky behavior scales to correct for positive skew. To assess *school bonding*, adolescents used a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*) to respond to six questions (e.g., “You feel like you are part of your school”) about their feelings of connectedness and belonging at school (Bearman, Jones, & Udry, 1997); responses were averaged. Mothers provided report cards detailing each offspring’s academic

grades in English, math, science, and social studies/history (0 = F, 4 = A) for the current school year and *grade point average* (GPA) was computed. The only significant correlation between older and younger sibling reports of adjustment was for risky behavior ( $r = .30$ ,  $p < .01$ ).

*Familism values.* Adolescents’ familism values were measured by using the mean of a 16-item, 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*) from the Mexican American Cultural Values Scale (Knight et al., in press). The scale reflects three components of familism: support (e.g., “It is always important to be united as a family”), obligation (e.g., “Parents should be willing to make great sacrifices to make sure their children have a better life”), and family as a reference point (e.g., “Children should be taught to always be good because they represent the family”). Older and younger sibling reports were not significantly correlated.

*Family context factors.* Parental warmth was measured with the mean of eight questions from the responsiveness subscale of the Child’s Report of Parental Behavior Inventory (Schwarz, Barton-Henry, & Pruzinsky, 1985). Youth completed separate questionnaires (e.g., “My mother/father understands my problems and worries.”) about their relationships with each parent at different points during the interview using a 4-point Likert scale (1 = *really unlike*, 4 = *really like*). Reports about mothers and fathers were correlated ( $r = .43$ ,  $p < .01$  for older siblings;  $r = .53$ ,  $p < .01$  for younger siblings). To reduce collinearity and to obtain a single measure of parental warmth, each adolescent’s report of maternal and paternal warmth was averaged. Older and younger sibling reports of parental warmth were correlated ( $r = .30$ ,  $p < .01$ ). Parents reported their education in years (we used the average of mothers and fathers), their marital status (married/cohabiting vs. divorced/separated), and the age and gender of each offspring.

## RESULTS

### Analysis Plan

We used a MLM approach to test a series of 12 two-level random intercept models. This approach accounted for the correlated nature

Table 1. Means (and Standard Deviations), Cronbach's  $\alpha$ , and Ranges for Study Variables (N = 358 Adolescents from 179 Families)

	Possible Range	Mean (SD)		Cronbach's $\alpha$	
		Older Sibling	Younger Sibling	Older Sibling	Younger Sibling
Parental warmth	1–4	3.06 (.35)	3.27 (.59)	.93	.93
Sibling warmth	1–5	2.93 (.74)	2.90 (.70)	.82	.73
Sibling relational aggression	1–5	1.79 (.81)	2.00 (.96)	.80	.83
Sibling hostility	1–5	2.61 (.85)	2.61 (1.03)	.80	.85
Familism values	1–5	4.10 (.51)	4.19 (.54)	.89	.90
Depressive symptoms <sup>a</sup>	1–3	1.15 (.17)	1.16 (.17)	.77	.73
Risky behavior <sup>a</sup>	1–4	1.42 (.27)	1.26 (.20)	.88	.79
School bonding	1–5	3.70 (.71)	3.82 (.67)	.74	.70
GPA	0–4	2.48 (.81)	2.88 (.73)	—	—

<sup>a</sup>Variable was log transformed for analyses.

of the data (i.e., child nested within family; Raudenbush & Bryk, 2002) and allowed us to directly test for birth-order effects by including both older and younger siblings in the same models. Level 1 included measures specific to each sibling (e.g., youth gender, sibling warmth); Level 2 included measures that were shared by both siblings (e.g., parents' education, family structure).

Each of the three sibling relationship qualities (warmth, relational aggression, and hostility) was tested in a separate model as a predictor of each of the four dependent variables (depressive symptoms, risky behavior, school bonding, and GPA). To address our first research goal, we estimated a series of models testing the main effects of sibling relationship quality on adjustment (these results are discussed in the text but are not tabled). Interaction terms with birth order and familism values were then added to the models to address our remaining three goals. Variables comprising the interaction terms were centered at the mean to reduce collinearity. Main effects for sibling relationship quality, familism values, and birth order (dummy coded for older vs. younger) were included in all final models. Interaction terms that were not significant at the  $p < .10$  level were removed from the final models unless the three-way interaction was significant, in which case all lower-order effects were included. Depending on the nature of the interaction, significant interaction effects were followed up by either (a) testing the effects for older and younger siblings separately or (b) running separate models for high (one standard deviation above the mean) and low (one standard deviation below the

mean) familism groups. Interactions with age were also tested. Because age and birth order were highly confounded in this sample, however ( $r = .75, p > .01$ ) and our goal was to test theoretical predictions about birth-order effects, age was dropped from the analyses. Interactions involving adolescent gender and gender dyad composition were also examined; however, none of these reached statistical significance. All models were tested using SAS 9.1.

#### *Links Between Adjustment, Sibling Relationship Qualities, and Familism Values*

Descriptive data are presented in Table 1. Youth reported generally positive family relationships, with parental and sibling warmth falling above the scale midpoints and sibling relational aggression and hostility at or below the midpoints. Similarly, familism values were strong. About half of the sample reported no or only one depressive symptom and had only engaged in an average of one or two risky activities in the past year. With respect to school bonding, average scores were well above the scale midpoint, and GPAs fell in the B/B–range and B–/C+ range for younger and older siblings, respectively. Reliabilities were acceptable, ranging from .70 to .93.

*Family context factors.* The first step was to control for family context factors. These variables showed a consistent pattern across all models: Adolescents whose parents were divorced or separated participated in more risky behaviors and had lower GPAs than those living in two-parent homes; parents' education



was positively linked to GPA; girls reported more depressive symptoms, higher grades, and less risky behavior than boys; parental warmth was a strong negative predictor of depressive symptoms and risky behavior; and older siblings reported more risky behavior and had lower GPAs than younger siblings. Although familism was not treated as a control variable, its pattern was also consistent across all models, showing a negative link with risky behavior and a positive link with school bonding. Results are organized by sibling relationship qualities (see Tables 2 and 3). In the case of sibling hostility, no significant interaction effects emerged; as such, these findings were not tabled but are discussed in the text.

*Sibling warmth.* In the main effects model predicting *depressive symptoms*, sibling warmth was not a significant predictor; however, when the interaction effects were added, two significant two-way interactions emerged (see Table 2). Inconsistent with the hypothesis that sibling warmth would function as a protective factor, follow-up tests on the sibling warmth × birth order interaction revealed that sibling warmth was positively associated with depressive symptoms. This effect was significant for younger siblings,  $\gamma = 0.04, SD = 0.02, t = 2.12, p < .05$ , but not older siblings,  $\gamma =$

$-0.002, SD = 0.02, t = -0.14, ns$ . A follow-up of the sibling warmth × familism interaction was not significant.

In the main effects model predicting *risky behavior*, an unanticipated positive effect for warmth emerged,  $\gamma = 0.05, SD = 0.02, t = 2.45, p < .05$ , suggesting that more warmth was associated with higher levels of risky behavior. When the interaction effects were added to the model, however, the main effect was qualified by a three-way interaction between warmth, familism, and birth order, which showed that adolescents who reported low familism values and high warmth reported the most participation in risky behavior,  $\gamma = 0.11, SD = 0.03, t = 3.21, p < .05$ . Among youth with high familism values, risky behavior did not vary as a function of warmth,  $\gamma = 0.02, SD = 0.04, t = 0.79, ns$  (see Figure 1, Panel D). Further analyses revealed that the effect was found only among older siblings,  $\gamma = -0.08, SD = 0.04, t = -1.83, p < .10$ ; for younger siblings,  $\gamma = 0.02, SD = 0.04, t = 0.52, ns$ . This pattern was contrary to expectations: sibling warmth functioned as a risk factor for participation in risky behavior when familism values were low, and this effect was evident for older, but not younger, siblings.

Table 2. Unstandardized ( $\gamma$ ) and Standardized Regression Coefficients (SRC) for Models Predicting Adjustment with Sibling Warmth

	Depressive Symptoms <sup>a</sup>		Risky Behavior <sup>b</sup>		School Bonding <sup>c</sup>		Grade Point Average <sup>d</sup>	
	$\gamma$ (SE)	SRC	$\gamma$ (SE)	SRC	$\gamma$ (SE)	SRC	$\gamma$ (SE)	SRC
Intercept	0.32 (.09)**		0.62 (.13)**		3.03 (.37)**		1.56 (.43)**	
Family structure	-0.02 (.03)	-.04	0.09 (.04)*	.12	-0.13 (.12)	-.06	-0.31 (.13)*	-.13
Parents' education	0.00 (.01)	.04	-0.00 (.01)	-.01	0.03 (.02)	.08	0.08 (.03)**	.18
Gender	-0.04 (.02)*	-.12	0.06 (.02)*	.12	-0.10 (.07)	-.07	-0.27 (.08)**	-.17
Parental warmth	-0.07 (.02)**	-.26	-0.09 (.02)**	-.23	0.08 (.06)	.07	-0.01 (.08)	-.01
Birth order (BO)	0.03 (.02)†	.06	-0.10 (.02)**	-.20	0.11 (.07)	.08	0.40 (.08)**	.25
Warmth	-0.00 (.02)	-.01	0.07 (.02)**	.20	0.10 (.07)	.10	-0.02 (.06)	-.02
Familism (F)	-0.03 (.02)	-.09	-0.14 (.03)**	-.30	0.20 (.11)†	.15	0.21 (.13)	.14
Warmth × BO	0.04 (.02)†	.12	-0.06 (.03)*	-.12	-0.03 (.10)	-.02		
F × BO			0.16 (.05)**	.25	0.03 (.15)	.02	-0.37 (.16)*	-.21
Warmth × F	-0.04 (.02)*	-.11	-0.08 (.04)*	-.15	0.28 (.12)*	.18		
Warmth × F × BO			0.10 (.05)†	.13	-0.32 (.17)†	-.15		

Note. Divorced/separated parents = 1; Not divorced/separated parents = 0. Younger sibling = 1; Older sibling = 0. Male = 1; Female = 0.

<sup>a</sup>N = 358; R<sup>2</sup> = .09. <sup>b</sup>N = 339; R<sup>2</sup> = .29. <sup>c</sup>N = 350; R<sup>2</sup> = .01. <sup>d</sup>N = 313; R<sup>2</sup> = .19.

†p < .10. \*p < .05. \*\*p < .01.

Table 3. Unstandardized ( $\gamma$ ) and Standardized Regression Coefficients (SRC) for Models Predicting Adjustment With Sibling Relational Aggression

	Depressive Symptoms <sup>a</sup>		Risky Behavior <sup>b</sup>		School Bonding <sup>c</sup>		Grade Point Average <sup>d</sup>	
	$\gamma$ (SE)	SRC	$\gamma$ (SE)	SRC	$\gamma$ (SE)	SRC	$\gamma$ (SE)	SRC
Intercept	0.29 (.09)**		0.56 (.13)**		3.08 (.37)**		1.57 (.43)**	
Family structure	-0.02 (.03)	-.04	0.10 (.04)*	.13	-0.12 (.12)	-.06	-0.31 (.13)*	-.13
Parents' education	0.00 (.01)	.004	-0.00 (.01)	-.01	0.03 (.02)	-.08	0.08 (.02)**	.18
Gender	-0.04 (.02)*	-.12	0.05 (.02)*	.10	-0.11 (.07)	-.08	-0.26 (.08)**	-.16
Parental warmth	-0.06 (.02)**	-.22	-0.07 (.02)**	-.18	0.09 (.06)	.08	-0.02 (.07)	-.02
Birth order (BO)	0.02 (.02)	.06	-0.11 (.02)**	-.33	0.08 (.07)	.06	0.40 (.08)**	.25
Rel aggress. (RA)	0.04 (.02)**	.21	0.02 (.02)	.07	0.01 (.04)	.01	0.00 (.05)	.00
Familism (F)	-0.03 (.03)	-.09	-0.11 (.03)**	-.24	0.20 (.07)**	.15	0.20 (.13)	.13
RA $\times$ BO	-0.02 (.02)	-.08	0.02 (.03)	.06				
F $\times$ BO	0.03 (.03)	.07	0.13 (.05)**	.20			-0.37 (.16)*	-.18
RA $\times$ F	0.05 (.02)*	.17	0.03 (.03)	.07				
RA $\times$ F $\times$ BO	-0.08 (.03)*	-.20	-0.08 (.04) <sup>†</sup>	-.14				

Note. Divorced/separated parents = 1; Not divorced/separated parents = 0. Younger sibling = 1; Older sibling = 0. Male = 1; Female = 0.

<sup>a</sup> $N = 358$ ;  $R^2 = .11$ . <sup>b</sup> $N = 339$ ;  $R^2 = .22$ . <sup>c</sup> $N = 350$ ;  $R^2 = .03$ . <sup>d</sup> $N = 313$ ;  $R^2 = .19$ .

<sup>†</sup> $p < .10$  \* $p < .05$  \*\* $p < .01$

In terms of *school bonding*, the main effect for sibling warmth was not significant, but the three-way interaction between warmth, familism, and birth order was. Follow-up analyses showed that the interaction effect was significant for older siblings only,  $\gamma = 0.30$ ,  $SD = 0.13$ ,  $t = 2.32$ ,  $p < .05$ ; for younger siblings,  $\gamma = -0.06$ ,  $SD = 0.11$ ,  $t = -0.52$ , *ns*. For older siblings, the combination of high familism values and high warmth was associated with stronger school bonding,  $\gamma = 0.23$ ,  $SD = 0.10$ ,  $t = 2.21$ ,  $p < .05$ . For those who reported low familism values, in contrast, school bonding was not associated with warmth,  $\gamma = -0.08$ ,  $SD = 0.10$ ,  $t = -0.81$ , *ns* (see Figure 1, Panel A). This pattern was consistent with the *multiplicative protective* hypothesis, in that the combination of two protective factors (i.e., sibling warmth and strong familism values) was linked with the strongest school bonding. In terms of birth order, however, this finding did not conform to the expectation that younger siblings would show stronger effects than older siblings. With respect to *GPA*, there was no main effect for sibling warmth, and follow-up tests on the Familism  $\times$  Birth Order interaction were not significant.

*Sibling relational aggression.* Results from the models predicting adjustment with sibling relational aggression can be found in Table 3. In the main effects model predicting *depressive*

*symptoms*, the expected positive effect for relational aggression emerged,  $\gamma = 0.03$ ,  $SD = 0.01$ ,  $t = 2.88$ ,  $p < .01$ . When the interaction terms were added, the main effect was qualified by a significant three-way interaction, which revealed that adolescents with high familism values and low relational aggression reported the fewest depressive symptoms,  $\gamma = 0.07$ ,  $SD = 0.02$ ,  $t = 3.39$ ,  $p < .01$ , but for youth with low familism values, depressive symptoms were not linked to relational aggression,  $\gamma = 0.01$ ,  $SD = 0.02$ ,  $t = 0.76$ , *ns* (see Figure 1, Panel B). This pattern showed a *multiplicative protective* effect, suggesting that having two as opposed to only one protective factor (i.e., low sibling relational aggression and strong familism values) was linked with fewer depressive symptoms. Contrary to predictions based on social learning theory, further analyses revealed that this interaction effect was significant for older,  $\gamma = 0.05$ ,  $SD = 0.02$ ,  $t = 2.26$ ,  $p < .05$ , but not younger siblings,  $\gamma = -0.02$ ,  $SD = 0.02$ ,  $t = -1.02$ , *ns*.

In the main effects model predicting *risky behavior*, the effect for relational aggression emerged in the predicted direction,  $\gamma = 0.03$ ,  $SD = 0.01$ ,  $t = 1.95$ ,  $p < .10$ . Furthermore, the three-way interaction between relational aggression, familism, and birth order was significant. Follow-up tests showed that youth who reported both low familism

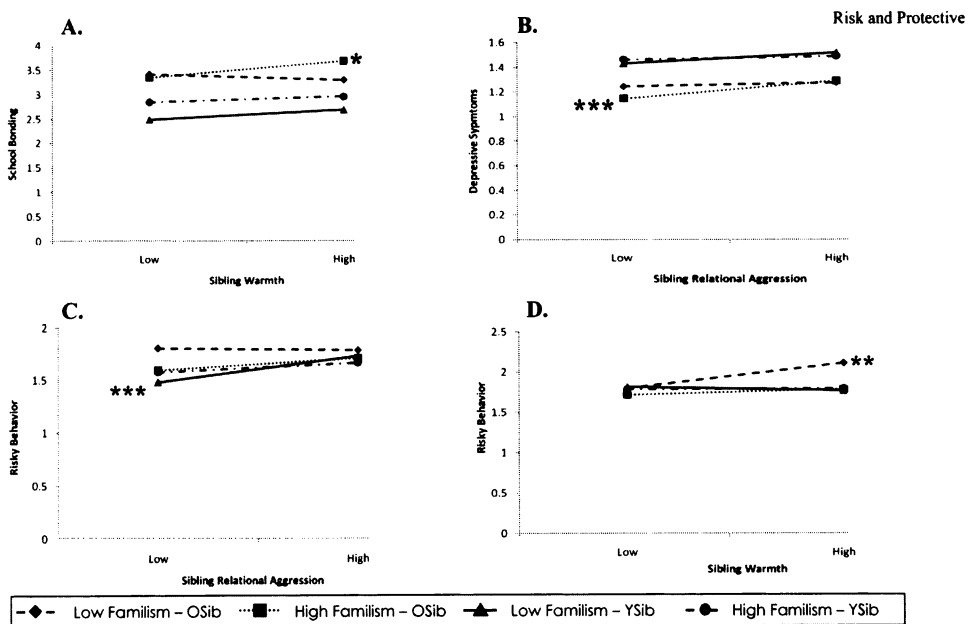
values and high relational aggression showed the most risky behavior,  $\gamma = 0.08$ ,  $SD = 0.02$ ,  $t = 3.99$ ,  $p < .01$ . For youth with high familism values, sibling relational aggression was not linked to risky behavior,  $\gamma = 0.03$ ,  $SD = 0.02$ ,  $t = 1.49$ , *ns*. Although this pattern was not predicted, it was congruent with the multiplicative protective pattern and might be considered a “multiplicative risk” effect. That is, the effect can be interpreted as the combination of two risk factors (i.e., high relational aggression and low familism) predicting more participation in risky behavior than just one risk factor alone. The interaction effect held only for younger siblings, however,  $\gamma = -0.05$ ,  $SD = 0.03$ ,  $t = -2.04$ ,  $p < .05$ ; for older siblings,  $\gamma = 0.04$ ,  $SD = 0.04$ ,  $t = 1.18$ , *ns* (see Figure 1, Panel C), consistent with expectations for birth order. There were no significant main effects for relational aggression on *school bonding* or *GPA*, and follow-up analyses of the Familism  $\times$  Birth Order interaction for *GPA* were not significant.

*Sibling hostility*. The main effects models predicting *depressive symptoms* and *risky behavior* (not shown) revealed the expected positive main effects for hostility,  $\gamma = 0.03$ ,  $SD = 0.01$ ,  $t = 3.09$ ,  $p < .01$ ;  $\gamma = 0.03$ ,  $SD = 0.01$ ,  $t = 1.96$ ,  $p < .10$ , respectively, but no interaction effects emerged. There were no significant main or interaction hostility effects in the *school bonding* or *GPA* models.

DISCUSSION

Our purpose in this study was to examine the risk and protective effects of sibling relationships on positive adjustment and adjustment problems and to explore familism values and birth order as potential moderators of these linkages. Our findings showed that, in a normative sample of African American adolescents, sibling relationship qualities were associated with depressive symptoms and risky behavior even after controlling for parent-child relationship qualities and family background characteristics. Furthermore, as predicted by a cultural-ecological perspective (Spencer, 1995), sibling relationships did

FIGURE 1. PLOTS OF THE SIGNIFICANT SIBLING RELATIONSHIP  $\times$  FAMILISM  $\times$  BIRTH ORDER INTERACTIONS.



Note. Panels A and B show the multiplicative protective patterns for older siblings (Osib), panel C shows the multiplicative risk pattern for younger siblings (Ysib), and Panel D is the paradoxical pattern for older siblings. Lines without asterisks are not significantly different from zero. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

not have universal implications; rather, in many cases, cultural values moderated the effects such that the combination of stronger familism values and a harmonious sibling relationship predicted more positive outcomes. Stronger effects emerged in the models predicting adjustment problems, however, and we found few effects for GPA and school bonding. It is possible that the aspects of sibling relationships measured in this study were overly general in relation to academic outcomes. Perhaps other sibling relationship behaviors, such as helping with homework or modeling positive school bonding attitudes, are more relevant for such outcomes. In addition, contextual factors such as parental education and family structure were strong predictors of GPA, suggesting that structural factors may play an important role in this domain. Finally, a number or birth-order effects emerged, but the findings were mixed. Three specific patterns emerged, which we describe below as a multiplicative protective pattern, a multiplicative risk pattern, and a paradoxical pattern.

#### *Protective and Risk Patterns*

A goal of the study was to explore the role of culture, measured here by familism values, in sibling influence processes. This study furthers past research by examining *within-culture* variations in familism values among African American adolescents and highlights the role of cultural context in family dynamics. Contrary to predictions based on resilience theory (Rutter, 1987), we did not find that familism values acted as a buffer against the potentially harmful impact of sibling negativity. The two *multiplicative protective* patterns revealed, however, that a harmonious sibling relationship in concert with strong familism values was associated with the lowest levels of depressive symptoms and the highest levels of school bonding for older siblings. These findings support past research on protective processes (Pollard et al., 1999), which suggests that each additional protective factor enhances an individual's ability to resist negative outcomes. In addition, the results for school bonding suggest that this process applies not only to risk reduction but could also play a role in promoting positive outcomes. Although the mechanisms underlying these results cannot be determined with these data, one possibility is that the benefit of a warm sibling relationship is especially salient when the individual places

high value on family relationships. This match between the individual's values and experience in the sibling relationship may instill a sense of competence and self-worth that can protect youth against depression and foster a strong sense of belonging at school.

The complementary *multiplicative risk* pattern suggested that, in the case of participation in risky behavior, younger siblings who experienced a "double hit" (i.e., low familism and high sibling relational aggression) showed the poorest outcomes. In a cultural context that strongly values family, these youth experienced undermining and social exclusionary practices by their siblings. In some cases, youth's low familism values may facilitate high levels of relational aggression. Youth may also be employing a defensive reaction to deny the importance of family loyalty and cohesion in the face of direct sibling attacks. In this way, cultural values have the potential to alter the implications of sibling relationships, as suggested by a cultural-ecological perspective (Spencer, 1995). Notably, these effects were evident even after controlling for characteristics that reflect important aspects of youths' family contexts, including parent-child warmth and parental education.

The results also revealed unanticipated *paradoxical* patterns. For younger siblings, warm sibling relationships were linked with more depressive symptoms. This finding could be a reflection of our correlational design and its inability to determine causal direction; perhaps older siblings initiate warm behavior toward depressed younger siblings. A second paradoxical finding was that the combination of low familism values and high sibling warmth was associated with more risky behavior for older siblings. The combination of low familism values and high sibling warmth itself was surprising, and may be evidence of a compensatory process that some researchers have reported when siblings turn to one another because of problems in the larger family context (Jenkins, 1992). In such instances, sibling "deviance training" also may ensue (Bullock & Dishion, 2002), with siblings forming a strong coalition that undermines parenting and promotes deviance. More research is needed to replicate this finding, however, and to test possible explanations for this pattern.

This study extended previous work on siblings by highlighting the implications of relational aggression, a construct that has received



little attention in the context of the sibling relationship, as well as the more commonly studied hostility construct. The findings suggest that, although both of these negative dimensions of sibling relationships were risk factors for poor adjustment, the patterns for relational aggression were more complex in that they were conditioned by adolescents' familism values. In part, this may be because the intentions of overt hostility are clearly interpretable and the consequences are immediate, whereas relational aggression is long-lasting and designed to damage the network of personal relationships. Perhaps relational aggression is especially salient among youth who strongly value family loyalty and cohesion because its purpose is to undermine social bonds.

### *The Question of Birth Order*

A central study goal was to directly test birth order as a moderator of the links between sibling relationship qualities, familism values, and adjustment by including older and younger siblings in the same models. On the basis of tenets of social learning theory, we expected associations to be stronger for younger than for older siblings. Of the five significant birth order interactions, however, two indicated links between predictor variables and outcomes for younger siblings and three for older siblings. These results do not provide an unambiguous answer to the birth-order question. The findings for older siblings are at odds with social learning theory predictions; however, they are consistent with other research that has documented links between sibling relations and adjustment for older siblings (Branje et al., 2004; Pike et al., 2005). A possible explanation is that older siblings tend to set the tone of the sibling relationship. In contrast, younger siblings may be resigned to accept negative aspects of a sibling relationship and find ways to protect their adjustment or disengage from the relationship rather than change it. Importantly, as in most studies, birth order and age are highly correlated in this sample, making it impossible to determine which factor is driving these effects. Samples that include two or more siblings at a range of ages are needed to disentangle age and birth-order effects. Furthermore, these issues should be addressed with designs that allow for direct comparisons of siblings from the same family.

### *Limitations*

The current study has a number of limitations. First, the cross-sectional data prevent firm inferences of causality. Consistent with social learning theory, we have interpreted the findings to suggest that sibling relationship qualities and familism values shape adolescent adjustment, but it is likely that the processes are dynamic and bidirectional. Another flaw is mono-reporter bias—all study measures were self-reported by adolescents. Reporter bias may lead to inflated associations despite our attempts to control for individual and family characteristics. Third, our sample of two-parent, working, and middle class African American families represents a group that has been underresearched, although the current sample is not representative of the African American population as a whole. Because we studied a nonclinical sample, the variability in adjustment problems was limited; nonetheless, we were able to detect associations between sibling relationship quality and depressive symptoms and risky behavior in this relatively well-adjusted sample. More research on nationally representative samples is needed to replicate and further investigate the effects that emerged in this study. Finally, given the dearth of literature on how cultural factors affect African American family dynamics and youth adjustment, this study was a preliminary step toward understanding these complex processes. Future work should explore additional cultural dimensions, such as religiosity, racial socialization, and the role of extended family members, that may have implications for African American family relationships and psychosocial adjustment.

### *Implications for Practice*

Our findings demonstrate that, net of the parent-child relationship and other family factors, the sibling relationship matters for individual adjustment and may be a viable target for prevention efforts aimed at reducing adjustment problems among African American adolescents. In particular, this study highlights the need to address sibling relational aggression, a phenomenon that many adults may not even be aware of because of its clandestine nature. The interaction effects in this study also suggest that the cultural values are important, and that promoting positive sibling relationships in conjunction with fostering positive familism

values may be more effective than addressing either protective factor in isolation. Furthermore, our findings underscore the complexities of birth-order effects; intervention developers and staff should be cognizant that the sibling relationship has implications for older as well as younger siblings' adjustment, although at times in different ways.

Most existing family prevention programs focus on the parent-child relationship, neglecting the sibling dyad. One exception is the *More Fun with Sisters and Brothers Program* (Kennedy & Kramer, 2008), which teaches young children socio-emotional skills in the context of the sibling relationship and which has been shown to effectively promote prosocial sibling interactions. Other programs focus on teaching parents to effectively mediate sibling conflicts (Smith & Ross, 2007). These programs, however, were designed for children, and to date there are no programs for adolescent-age siblings. Sibling-focused prevention practices or programs for adolescents should capitalize on aspects of adolescent development, including the desire to forge close and meaningful personal connections and the more egalitarian nature of sibling relationships at this age. Strategies to promote positive sibling interactions might include teaching emotional supportiveness and problem-solving strategies, encouraging siblings to spend time on shared constructive activities, and reducing relational aggression behaviors. Alternatively, existing family-based intervention programs, such as *Strengthening Families* (Kumpfer, Molgaard, & Spoth, 1996), could build in a sibling component designed to promote positive sibling relationships along with improving other family relationships. Future intervention work would benefit from including the sibling relationship as a mechanism for promoting healthy adolescent adjustment.

#### NOTE

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