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Sibling Relationships and Adolescent Adjustment: Longitudinal Associations in Two-Parent African American Families

Shawn D. Whiteman,

Purdue University

Anna R. Solmeyer, and

The Pennsylvania State University

Susan M. McHale

The Pennsylvania State University

Abstract

Sibling relationships have been described as love-hate relationships by virtue of their emotional intensity, but we know little about how sibling positivity and negativity operate together to affect youth adjustment. Accordingly, this study charted the course of sibling positivity and negativity from age 10 to 18 in African American sibling dyads and tested whether changes in relationship qualities were linked to changes in adolescents' internalizing and externalizing behaviors. Participants were consecutively-born siblings (at Time 1, older siblings averaged 14.03 ($SD = 1.80$) years of age, 48% female; younger siblings averaged 10.39 ($SD = 1.07$) years of age, 52% female) and two parents from 189 African American families. Data were collected via annual home interviews for three years. A series of multi-level models revealed that sibling positivity and sibling negativity declined across adolescence, with no significant differences by sibling dyad gender constellation. Controlling for age-related changes as well as time-varying parent-adolescent relationship qualities, changes in sibling negativity, but not positivity, were positively related to changes in adolescents' depressive symptoms and risky behaviors. Like parent-adolescent relationships, sibling relationships displayed some distancing across adolescence. Nevertheless, sibling negativity remained a uniquely important relational experience for African American adolescents' adjustment.

Correspondence concerning this article should be addressed to: Shawn D. Whiteman, Department of Human Development and Family Studies, 1202 W. State St., West Lafayette, IN 47907. Telephone: (765) 494-3312. Fax: (765) 496-1144. sdwhitem@purdue.edu. Shawn D. Whiteman, Department of Human Development and Family Studies, Purdue University, 1202 W. State St., West Lafayette, IN 47907

Anna R. Solmeyer, Department of Human Development and Family Studies, The Pennsylvania State University, Beecher-Dock House, University Park, PA 16802

Susan M. McHale, Social Science Research Institute and Department of Human Development and Family Studies, The Pennsylvania State University, 114 Henderson (North), University Park, PA 16802

Author Contributions

SDW conceived of the study, participated in its design and coordination, aided in the analysis and interpretation of the data, and drafted the manuscript; ARS participated in the design and coordination of the study, performed the statistical analysis, interpretation of the data, and helped draft the manuscript; SMM aided in the conceptualization of the study and the interpretation of the results and helped draft the manuscript. All authors have read and approved the final manuscript.

Conflict of Interest

The authors report no conflict of interests.

Keywords

adolescent adjustment; African American families; internalizing; externalizing; sibling relationships

Introduction

Relationships with siblings differ from those with other partners. Given their proximity and availability during childhood and adolescence, siblings are frequent, though not necessarily sought out companions and social partners (McHale & Crouter, 1996; Updegraff, McHale, Whiteman, Thayer, & Delgado, 2005). Relationships with brothers and sisters are also distinctive in their emotional intensity--both positive (e.g., warmth, support, love) and negative (e.g., conflict, rivalry)--leading to their characterization as love-hate or emotionally ambivalent relationships (Noller, 2005). Although relationships with sisters and brothers are typified by both positive and negative dimensions, these dimensions are not strongly correlated (Furman & Buhrmester, 1985; Stocker & McHale, 1992). Perhaps for this reason, most prior studies have targeted either sibling positivity or sibling negativity, and we know little about how they develop and together have implications for youth. The present study aimed to provide a more holistic understanding of the implications of adolescents' sibling relationships by examining the time-varying associations between both positivity and negativity in sibling relationships and African American adolescents' adjustment.

Changes in Dimensions of Sibling Relationships across Adolescence

Consistent with normative developmental trend towards greater autonomy and independence from the family, results from early, largely cross-sectional studies suggested that positivity in sibling relationship qualities declined from middle childhood to adolescence (Brody, Stoneman, & McCoy, 1994; Buhrmester & Furman, 1990). Following increases in sibling conflict in early adolescence (Brody et al., 1994), some investigations found that conflict also declined from middle adolescence through early adulthood (Buhrmester & Furman, 1990; Cole & Kerns, 2001; Stewart et al., 2001). Longitudinal studies have largely substantiated these findings. Kim, McHale, Osgood, and Crouter (2006) found that sibling conflict peaked in early adolescence and declined thereafter, but that changes in sibling intimacy varied as a function of dyad gender constellation. Intimacy was stable across adolescence for same-gender dyads, with sister pairs reporting more intimacy than brother pairs. Such patterns are consistent with other work showing that sister-sister dyads tend to be the most intimate, perhaps by virtue of gender role scripts and socialization that promote expressiveness and kin-keeping orientations in girls and women (e.g., Eagly, 1987; Tucker et al., 1999). In mixed-gender dyads, however, Kim and colleagues (2006) found that intimacy was low in early adolescence, but increased in late adolescence. These investigators argued that opposite-gender siblings become important sources of information and advice about heterosexual relationships that emerge and proliferate across adolescence.

To date, most research on siblings comes from European and European American families: We found no studies that examined the development of sibling relationships in African American families. This oversight is surprising given demographic data on sibship size,

which is larger in African American families (McHale, Updegraff, & Whiteman, 2012), and research documenting the salience and developmental significance of kin relationships--including sibling relationships--in African American families (Brody & Murry, 2001; Brody et al., 2003; McHale, Whiteman, Kim, & Crouter, 2007). To address this gap--and the larger gap in our knowledge of normative family dynamics in African American families (McLoyd, 1998)--our first goal was to chart the developmental course of sibling positivity and negativity across adolescence in a sample of two-parent African American families. Although the limited research suggests that family processes in minority and majority families are similar in many ways (e.g., Boykin & Toms, 1985), some investigators have found that African American families are less gender stereotypical than European American families (Hossain & Roopnarine, 1993). More egalitarian family dynamics may mean that gendered sibling relationship patterns are less prevalent in this sociocultural group. To explore this possibility, we tested whether there were differences in the level or patterns of change in sibling relationships as a function of the gender constellation of the sibling dyad.

Sibling Relationships and Youth Adjustment

Although siblings have been relatively overlooked by developmental and family scholars, they have unique implications for adolescents' adjustment; again, however, this research is generally limited to European and European American families (McHale et al., 2012). Research in this tradition generally draws on a social learning model, which targets the significance of reinforcement and modeling processes in explaining the link between sibling relationship negativity and youth adjustment problems. Seminal work by Patterson (1984), for example, found that sibling relationships could serve as training grounds for aggressive and deviant behaviors, with brothers engaging in coercive and hostile interactions, which were subsequently rewarded and then escalated. Consistent with these social learning processes other researchers found that sibling negativity in middle childhood and adolescence, including conflict, aggression, and coercive exchanges, was associated with concurrent and later externalizing problems, including deviance, bullying, and substance use (Bank, Burraston, & Snyder, 2004; Criss & Shaw, 2005; Solmeyer, McHale, & Crouter, 2014; Stocker, Burwell, & Briggs, 2002). Importantly, research using genetically informed designs revealed that the links between sibling negativity and externalizing behaviors emerged net of other influences, including shared genes and shared parenting (Natsuaki, Ge, Reiss, & Neiderhiser, 2009). In addition to externalizing problems, sibling negativity predicted adolescents' internalizing symptoms, such as anxiety and depression, controlling for parent-child relationship qualities and earlier adjustment (Kim, McHale, Crouter, & Osgood, 2007; Stocker et al., 2002). Finally, using a pattern analytic approach, and based on the first phase of data from the current sample, McHale et al. (2007) found that African American sibling relationships characterized by a combination of high negativity, high control, and low positivity were linked concurrently to more depressive symptoms in older and younger siblings and more risky behavior in older siblings.

A smaller body of work shows that positive sibling relationship qualities (e.g., warmth, intimacy, and support) are protective for youth adjustment. In a cross-sectional study of British siblings in middle childhood, Pike, Coldwell, and Dunn (2005) found that sibling positivity was related to more prosocial behaviors and fewer behavioral problems for older

siblings, controlling for parent-youth relationship qualities and sibling negativity. One longitudinal study of U. S. families showed that sibling affection in early adolescence predicted more prosocial and fewer externalizing behaviors one year later (Padilla-Walker, Harper, & Jensen, 2010), and a study of Dutch youth found that sibling support was related to fewer internalizing and externalizing problems in early adolescence (Branje, van Lieshout, van Aken, & Haselager, 2004). Importantly, in the latter study the effect of sibling support was evident after controlling for support received from mothers, fathers, and friends. Finally, in a representative sample of British families, Gass, Jenkins, and Dunn (2007) found that sibling positivity buffered the effects of stressful life events on internalizing symptoms, with prior adjustment and parent-child relationships controlled.

In summary, accumulating evidence highlights risk and protective functions of sibling negativity and positivity during adolescence, though the focus has been almost exclusively on European and European American families. Another limitation is that most studies have investigated the correlates of either positivity or negativity or examined these two relationship dimensions in separate analyses. In the everyday lives of youth, however, positivity and negativity do not occur in isolation, and the effects of one may suppress or exacerbate the effects of the other. In fact, using pattern-analytic (or person-centered) techniques, scholars have shown that specific combinations of sibling positivity and negativity have unique implications for adolescents' adjustment (Buist & Vermande, 2014; McHale, et al., 2007; McGuire, McHale & Updegraff, 1996; Whiteman & Loken, 2006). Of the few variable-oriented studies that have compared the correlates of sibling positivity and negativity, one found that conflict, but not warmth, was linked to adolescent antisocial behavior (Criss & Shaw, 2005), but two others showed that positivity was more consistently linked than negativity to adjustment in middle childhood (Pike et al., 2005) and adolescence (Padilla-Walker et al., 2010). The present study aimed to further elucidate the roles of sibling positivity and negativity by using longitudinal data to examine how they are linked to African American adolescents' adjustment. We focused on markers of adolescents' internalizing (i.e., depressive symptoms) and externalizing (i.e., risk-taking) behaviors, both of which have been shown to emerge and typically increase across the course of adolescence (e.g., Cicchetti & Toth, 1998; Steinberg, 2004, 2007).

Current Study

Integrating work on the development and implications of sibling relationships and capitalizing on an accelerated longitudinal design (Raudenbush & Chan, 1992), this study: (a) charted the development of sibling positivity and negativity from about age 10 to about age 18 in a sample of African American families; and (b) then tested whether changes in these relationship qualities were linked to changes in adolescents' internalizing (i.e., depressive symptoms) and externalizing (i.e., risky behaviors) behaviors. Using multi-level modeling (MLM) allowed us to assess the linkages between sibling relationship qualities and adjustment, taking into account normative age-related changes in adjustment across adolescence. Further, to reduce the possibility of third variable confounds and isolate potential sibling influences, changes in parent-adolescent conflict and acceptance were included as controls.

Method

Participants

Data came from 189 families that participated in a three year longitudinal study of African American family relationships. Families identified as being African American or Black, and given the goals of the larger study, included both a mother and father who were living together and rearing at least two offspring in middle childhood or adolescence. To generate the sample, we targeted two contiguous urban centers on the Eastern Seaboard with substantial African American populations (for additional details on recruitment procedures see McHale et al., 2006). Families were recruited using two strategies. First, we hired African Americans residing in the targeted communities to recruit families by providing information about the study to local churches and community groups as well as distribute flyers at sites of youth activities. Interested families then contacted local recruiters, who in turn passed on their names to the project office. Second, we purchased a marketing list that included names and addresses of African American students in Grades 4 through 7 who lived in the same geographic region. We sent letters that described the study, and interested families either called an 800 number or returned a postcard. We were unable to calculate response rates because: (a) local recruiters were unable to report on the number of eligible families that received flyers; and (b) the marketing lists did not provide information on family structure or either presence or age of siblings.

Among participating families, 87% included married parents; in the remaining 13%, cohabiting/remarried couples had been living together for at least 4 years. Families varied from working to upper middle class as indexed by parent education ($M = 14.62$, $SD = 1.86$ for mothers and; $M = 14.35$, $SD = 2.29$ for fathers on a scale wherein: 12 = high school graduate and 16 = college graduate), occupational status ($M = 48.56$, $SD = 11.80$ for mothers and $M = 47.50$, $SD = 13.76$ for fathers on a scale wherein higher scores denote greater prestige, Nakao & Treas, 1994); jobs in this range included teacher's aide and law enforcement officer; and income ($M = \$89,144$, $SD = \$57,048$). Mean family income was relatively high, likely due to predominantly two-earner families (87% of mothers and 93% of fathers were employed at Year 1); nevertheless, the median income for sample families ($Mdn = \$82,000$) fell in the range of the median incomes of two-earner families from the two states in which families resided (\$98,163 and \$74,884; US Census Bureau, 2007).

Most families (80%) included two or three children ($M = 2.81$, $SD = 1.13$). In families with more than two children, we sampled two consecutively born siblings. At Year 1, older siblings averaged 14.03 ($SD = 1.80$; $range = 11.10 - 18.77$) and younger siblings, 10.39 ($SD = 1.07$; $range = 7.85 - 13.11$) years of age, with an average age spacing of 3.63 ($SD = 1.88$) years. The sample included 48 sister-sister pairs, 42 sister-brother pairs, 55 brother-sister pairs, and 44 brother-brother pairs. All target siblings, 97.71% of fathers, and 93.71% of mothers reported that they were African American/Black and there was no family in which neither parent was African American. Eighty percent were full biological siblings.

Participation rates indicated that 73% of families ($n = 138$) completed all three waves of measurement; 21% ($n = 40$) did not complete wave 2, and 22% ($n = 41$) did not complete wave 3. A series of independent samples *t*-tests revealed that those who dropped out were

not different from those who completed all three measurement waves in terms of their demographic profiles (i.e., family size, family income, parents' occupational prestige), sibling relationship qualities (i.e., positivity and negativity), or depressive symptoms. Older siblings from families that dropped out, however, reported more risky behaviors ($M = 3.35$, $SD = .27$) at Year 1 than those who completed all waves of measurement ($M = 3.24$, $SD = .22$), $t = 2.41$, $p < .01$, $d = .45$.

Procedure

Data were collected annually for three years. Each year a team of two interviewers, almost all of whom were African American, conducted separate home interviews with mothers, fathers, and each of the two target siblings. After obtaining informed consent/assent, family members were interviewed individually about their family relationships and individual well-being. The parent interviews lasted approximately 2 hours and the youth interviews lasted about 1 hour, and families were sent \$200 after completing their home interviews. Other than stable background information, all measures described below were collected at each of the three points of data collection. The Institutional Review Board approved all procedures.

Measures

Demographic information—Family background information including parents' marital status (0 = married; 1 = cohabiting/remarried), education, income, job prestige, family size, and offspring characteristics such as age, birth order, and gender, were obtained from parents. Given the correlation between mothers' and fathers' education, $r = .48$, $p < .01$, and to reduce the number of control variables, we averaged their scores ($M = 14.46$, $SD = 1.78$) and then centered parents' education at its mean. Family income was not normally distributed and therefore was log transformed ($M = 11.39$, $SD = 0.70$, signifying an average income of \$89,143) and then centered at its mean. Youth age was centered at the overall mean ($M = 13.28$, $SD = 2.53$) and categorical variables, including gender (0 = female, 1 = male), birth order (0 = earlier-born, 1 = later-born), siblings' biological relatedness (0 = not full biological siblings, 1 = full biological siblings) and gender composition of the sibling dyad (0 = same-gender, 1 = mixed-gender) were dummy coded.

Sibling positivity—Sibling positivity was assessed at each time point using 7 items from Stocker and McHale's (1992) Sibling Relationship Inventory (SRI). On a 5-point scale (1 = *never or hardly ever*, 5 = *always*), both older and younger siblings rated their experiences with their brother/sister (e.g., "How often do you do nice things like helping or doing favors for your sister/brother?"). Ratings were summed across the 7 items ($range = 7$ to 35) with higher scores denoting greater positivity (see Table 1 for descriptive data on all time-varying variables). Cronbach α s ranged from .75 to .83 across time and across reporters. Cross time correlations ranged from $r = .60$ to $r = .62$ for older siblings and from $r = .44$ to $r = .52$ for younger siblings.

Sibling negativity—Sibling negativity was rated by both older and younger siblings using 5 items from the SRI (Stocker & McHale, 1992). Using the same 5-point Likert scale, youth rated the frequency of their siblings' behaviors toward them (e.g., "How often does your sister/brother get mad at or angry with you?"). Ratings were summed across the 5 items

(*range* = 5 to 25) with higher scores denoting greater negativity. Cronbach *as* ranged from .75 to .84 across time and across reporters. Cross time correlations ranged from $r = .29$ to $r = .52$ for older siblings and from $r = .37$ to $r = .54$ for younger siblings. Finally, correlations between positivity and negativity ranged from $r = -.10$, *ns* to $r = -.27$, $p < .001$ across reporters and across the three waves.

Parent-adolescent acceptance—Mothers and fathers reported on their acceptance/responsiveness using 8 items from Schwarz, Barton-Henry, and Pruzinsky's (1985) revision of the parents' version of the Child's Report of Parental Behavior Inventory (CRPBI; Schaefer, 1965). Specifically, mothers and fathers rated their experiences with each of their participating offspring separately on a scale ranging from 1 (*not at all*) to 5 (*very much*). Example items include: "I am a person who understands my child's problems and worries;" and, "I am a person who sees my child's good points more than his/her faults." Ratings were averaged across the 8 items, with higher scores indicating greater parent-youth acceptance, and total scores could range from 1 to 5. Cronbach *as* ranged from .83 to .89 for both mothers and fathers.

Parent-adolescent conflict—Parent-youth conflict was assessed in terms of parents' reports of the frequency of conflict in particular domains using a measure adapted from Smetana (1988). Specifically, mothers and fathers rated the frequency of conflict with participating offspring separately using a 6-point scale that ranged from 1 (*not at all*) to 6 (*several times a day*); in all, 11 domains of conflict were rated (e.g., chores, appearance, and schoolwork). Conflict frequency was calculated as the sum of the 11 item ratings (*range* = 11 to 66), with higher scores representing greater conflict frequency. Cronbach *as* ranged from .81 to .86 for mothers, and from .85 to .93 for fathers.

Depressive symptoms—Older and younger siblings' depressive symptoms were measured using the 10-item version of the Children's Depression Inventory (Kovacs, 1985). For each item, youth chose one of three statements that described their feelings over the past week (e.g., "I am sad once in a while," "I am sad many times," or "I am sad all of the time"). Scores were summed (*range* = 0 to 20), with higher scores indicating higher levels of depressive symptoms, and Cronbach *as* ranged from .69 to .78.

Risky behaviors—Adolescents' participation in risky behaviors was measured via Eccles and Barber's (1990) 18-item index. Using a scale of 1 (*never*) to 4 (*more than 10 times*) youth rated the frequency of their participation in behaviors such as, "do something you knew was dangerous just for the thrill of it," "smoke cigarettes," and "skip a day of school." Scores were summed (*range* = 18 to 72), with higher scores indicating greater participation. Cronbach *as* ranged from .79 to .86. Because of their average age, younger siblings' risky behaviors were not assessed at Year 1; therefore, their reports are limited to study Years 2 and 3.

Overall, the distributions for depressive symptoms and risky behaviors scores were positively skewed and leptokurtic; therefore, log transformations were applied to each variable. Across the three waves of measurement, correlations between depressive symptoms and risky behaviors ranged from $r = .02$, *ns* to $r = .29$, $p < .001$.

Results

Analytic Plan

The results are organized around our goals: (a) to chart the developmental trajectories of sibling positivity and negativity across adolescence in African American families, and (b) to investigate how changes in these sibling relationships dimension were related to changes in youth adjustment. Toward this end, we tested a series of multi-level models (MLM) using the MIXED procedure in SAS 9.3. In this study, longitudinal assessments were clustered within individuals (Level 1), individuals were clustered within sibling dyads (Level 2), and sibling dyads were clustered within families (Level 3). Importantly, MLM does not require equal spacing between observations, permitting us to use youth age as a time metric despite age differences at each assessment point, and to take advantage of our accelerated longitudinal design that included two cohorts of adolescents (siblings) with overlapping age ranges (Raudenbush & Chan, 1992). MLM also can accommodate data that are unbalanced and missing-at-random (Singer & Willett, 2003).

Our initial models explored the trajectories of sibling positivity and negativity across adolescence (approximately ages 10 to 18). First, we estimated unconditional growth curves with youth age as the metric of time. In this step, we tested a series of nested models to evaluate whether intercepts and slopes should be treated as fixed or random. Second, we estimated conditional growth models to describe the developmental course of sibling positivity and negativity while controlling for youth gender and birth order, gender composition of the sibling dyad, siblings' biological relatedness, family income, parents' education and marital status. Finally, to examine whether the trajectories of sibling positivity and negativity varied as a function of gender composition of the sibling dyad, a third model included two- and three-way interaction terms between age, youth gender, and gender composition.

With a focus on within-individual change over time, our subsequent models examined the associations between changes in sibling positivity and negativity and changes in youth adjustment, taking into account (normative) age-related changes in adjustment as well as time-varying parent-youth relationship qualities and other background characteristics. Although not inherent in its design, we took advantage of the MLM framework to structure our analyses to focus on the correlates of within-individual change. Specifically, at Level 1, we included effects for all time-varying variables, namely age, sibling positivity and negativity, and maternal and paternal-youth acceptance and conflict. Age and parent-youth relationship qualities were grand-mean centered (i.e., centered around the sample mean), whereas measures of sibling positivity and negativity were person-mean centered (centered around each individual's cross-time mean, i.e., within-person effects). At Level 2 were the cross-time means for sibling positivity and negativity (centered around the sample means, i.e., between-person effects) and other sibling-specific time-invariant variables (i.e., youth gender and birth order). By including these two indices of the sibling relationship variables, our models disaggregated variance so that Level 1 effects tested whether *changes* in sibling relationships were linked to *changes* in adjustment, beyond stable individual differences. At Level 3 were family characteristics that were shared by both siblings (i.e., gender

composition of the sibling dyad, biological relatedness, family income, parents' education and marital status at Time 1).

To permit comparison of the magnitude of sibling relationship effects relative to effects of other family characteristics, effect size estimates were calculated by converting unstandardized gamma coefficients (γ) into standardized regression weights (β). Specifically, gamma coefficients were multiplied by the standard deviation of the predictor, and that product was divided by the standard deviation of the outcome variable. For categorical variables, Cohen d s were calculated by dividing the gamma coefficient by the standard deviation of the outcome and then converting the resultant d into β .

Developmental Trajectories of Sibling Positivity and Negativity

Sibling positivity—Deviance tests from the unconditional growth model of sibling positivity revealed that the best error structure included random intercepts at Levels 2 and 3 and a random slope at Level 2. A significant negative effect for age in the conditional growth models evidenced a linear decline in sibling positivity across adolescence (left side of Table 1). Effect size estimates indicated that the decline was equivalent to approximately one-sixth of a standard deviation per year. A significant effect of birth order indicated that later-born siblings reported less sibling positivity at age 13 (the centered value for the time metric) than did earlier-born siblings. Additionally, there were significant negative effects of parents' education and parents' marital status on sibling positivity. Specifically, youth whose parents had more education and those whose parents were cohabiting/remarried reported less positivity at age 13 than those whose parents had less education or were married, respectively. Gender composition of the sibling dyad did not moderate the pattern of change over time (not shown in Table 1).

Sibling negativity—Results from the unconditional growth models revealed that the best error structure included random intercepts at Levels 2 and 3. A significant negative effect for age in the conditional growth models indicated that sibling negativity declined linearly over time (right side of Table 1); effect size estimates showed that the decline in negativity was about one-seventh of a standard deviation per year. A significant effect of birth order indicated that later-borns reported less sibling negativity at age 13 than did earlier-borns. The declines in sibling negativity were not moderated by gender composition of the sibling dyad (not shown in Table 1).

Changes in Sibling Relationship Qualities Linked to Changes in Adjustment

Depressive symptoms—Results from the model predicting changes in youth's reports of depressive symptoms as a function of changes in sibling and parent-youth relationship qualities as well as other control variables are presented in Table 2. Although a non-significant effect for age revealed stability in youths' depressive symptoms over time aggregating across the sample, sibling negativity (and not positivity) was related to both cross-time levels and changes in depressive symptoms. First, the significant positive between-person effect signified that higher average levels of negativity were related to higher cross-time average depressive symptom scores. Second, the significant positive within-person effect of sibling negativity signified that, controlling for average levels of

negativity, increases in sibling negativity were related to increases in youth's reports of depressive symptoms over time. Conversely, decreases in negativity were associated with decreases in these internalizing symptoms over time. Importantly, this effect was net of the effects of normative age related change as well as changes in parent-youth relationships qualities across this same period. Finally, a main effect of gender revealed that girls reported more depressive symptoms than boys.

Risky behaviors—Table 3 shows the results for risky behaviors. A significant linear effect for age indicated that youth's participation in risky behaviors increased across adolescence. There were again no significant effects for sibling positivity, but significant between- and within-person effects for sibling negativity were found. The significant between-person effect indicated that higher average levels of negativity were related to higher cross-time average risky behaviors scores; whereas, the significant within-person effect revealed that controlling for average levels of negativity, increases in sibling negativity were associated with increases in risky behaviors over time. Conversely, decreases in negativity were associated with decreases in these externalizing behaviors over time. This effect for sibling negativity was net of significant effects for maternal and paternal acceptance (both protective factors, with acceptance negatively related to risky behavior) and paternal-youth conflict (a risk factor, with conflict positively associated with risky behavior). The standardized coefficients signified that the effect of sibling negativity on youth's risky behaviors was generally as strong as the effects of parent-youth relationship qualities. Finally, significant effects for gender and biological relatedness indicated that girls and full biological siblings engaged in less risky behaviors than boys and partially/unrelated siblings, respectively.

Discussion

Although studied less frequently than other close relationships (McHale et al., 2012), a growing body of research highlights unique implications of sibling relationships for adolescents' development (e.g., Buist, Dekovic, & Prinzie, 2013; Kim et al., 2006; Solmeyer et al., 2014). To date, most of this work has been limited by three key factors: (a) focus on sibling relationship qualities, such as positivity and negativity, in isolation; (b) failure to investigate dynamic time-varying associations between sibling relationship qualities and youth's adjustment; and (c) lack of attention to the development and implications of sibling relationships in ethnic minority families. This study addressed these gaps by investigating the development of both sibling positivity and negativity across adolescence in African American families and testing whether these relationship qualities were linked to adolescents' adjustment. Consistent with previous cross-sectional and longitudinal work with European American siblings (Buhrmester & Furman, 1990; Cole & Kearns, 2001; Kim et al., 2006) sibling positivity and negativity declined across adolescence. In contrast to the findings of Kim and colleagues (2006), changes in positivity were not moderated by gender constellation of the sibling dyad. Instead, declines in positivity were uniform for same- and mixed-gender dyads. Such findings are consistent with research suggesting that African American families are less gender stereotypical than European American families (e.g., Hossain & Roopnarine, 1993). Declines were modest, however, with effect sizes for both

sibling positivity and negativity at about one-sixth of a standard deviation per year. When considered across the three-year course of the study, these declines suggest some distancing (e.g., less warmth and less conflict) within the sibling relationship across adolescence. Such distancing is consistent with research and theory on parent-adolescent relationships (for a review see Laursen & Collins, 2009). Of practical significance, despite some distancing, sibling relationships, in particular sibling negativity, were significant predictors of internalizing symptoms and externalizing behaviors.

To date, most variable-oriented studies of the adjustment implications of sibling relationship qualities have examined either their positive or their negative dimensions or tested the two in separate analyses. Moreover, findings are mixed from the few studies that have considered both dimensions concurrently, with some showing more consistent connections between sibling conflict and adolescent outcomes (e.g., Criss & Shaw, 2005) and others demonstrating stronger links between positive relationship dimensions and adjustment outcomes (e.g., Padilla-Walker et al., 2010; Pike et al., 2005). Results from this study yielded consistent associations between sibling negativity, but not positivity, and youth adjustment. Further, significant effects for sibling negativity emerged at both the between- and within-person levels, showing that, not only was higher average negativity linked with more depressive symptoms, but that, controlling for youths' average sibling negativity, on occasions when they reported more negativity than they usually did, youth also reported more symptoms of depression and greater participation in risky behaviors than usual. These findings are consistent with previous work on European American samples suggesting that sibling negativity, in particular conflict, is a risk factor for depressive symptoms (Kim et al., 2007; Stocker et al., 2002) and problem behaviors (Bank et al., 2004; Natsuaki et al., 2009) during adolescence.

Unlike the findings from the work of Padilla et al. (2012) and Pike et al. (2005), which studied middle childhood and young adolescent samples, changes in sibling positivity were unrelated to changes in youth's adjustment in this sample. As youth negotiate the many transitions and challenges of adolescence, the implications of negative interactions with siblings, as well as parents, may become amplified and overwhelm the benefits of positive exchanges. The sociocultural stressors faced by minority youth in the U. S. and the cultural value placed on kinship, may also have made youth in this African American sample especially vulnerable to sibling negativity (Brody & Murry, 2001; Brody et al., 2003; McHale, et al., 2007). Future research should examine family experiences and cultural processes that may moderate the influence of sibling relationships in diverse socio-cultural groups.

Notably, the links between sibling negativity and youth adjustment were evident even after accounting for normative age-related changes and time-varying parent-youth relationships qualities. Furthermore, although effects were small to moderate in size, the associations between sibling negativity and youth adjustment outcomes were generally equivalent to or stronger than those between parent-youth relationship qualities and adjustment. Although normative development may increase the prominence of peers and other extra-familial social influences, salient and reciprocal sibling dynamics may explain their continued importance for adolescents' adjustment.

The results of this study should be interpreted within the context of several methodological limitations. First, our sample was restricted to two-parent working and middle class African American families, and the findings may not extend to youth from other family structures. Given demographic changes in the rates of marriage, divorce, cohabitation, single-parenthood in African American families, we need to understand how sibling relationship dynamics operate across a range of family structures and socioeconomic strata. For example, Brody and Murry (2001) suggested that sibling influences may be more pronounced in single-parent families in which parents' social and financial capital are limited. Findings from this study also suggest that future work would benefit from examining how gender roles and gender dynamics relate to the development of sibling relationships in African American families. Second, although we used three years of longitudinal data and focused on time-varying, within-person variation, we were only able to examine linear change. Longer-term longitudinal designs in which families are followed for more than three years would allow for examination of more complex patterns of change. For example, quadratic patterns of change may be evident in relationship dimensions such as sibling positivity given that young adults may report greater intimacy than adolescents (Scharf, Shulman, & Avigad-Spitz, 2005; Whiteman, McHale, & Crouter, 2011). Despite the advantages of a within-person approach to studying the implications of sibling relationship in which stable individual differences are controlled, the present study was correlational in design. Therefore, it is not possible to determine whether changes in sibling negativity led to changes in adjustment or the other way around. Future studies with more waves of data could use time-lagged designs to detect direction of effects, and intervention studies to promote positive sibling relationships could establish causal links between sibling relationship qualities and youth adjustment. Third, although parents reported on parent-child relationships, our study relied on youth's self-reports of their sibling relationship qualities and their adjustment. Therefore, it is possible that observed associations between relationship qualities and outcomes were inflated by common method variance (Campbell & Fiske, 1959). Finally, future work on sibling relationships, for both ethnic minority and majority families, would benefit from examination of a broader array of relationship dimensions. Recent work by Campione-Barr, Lindell, Greer, and Rose (2014), for example, highlights unique associations between siblings' relational aggression and adolescents' adjustment. Other potentially important dimensions of sibling relationships include siblings' intimate disclosures (e.g., Killoren & Roach, 2014), trust (e.g., Gamble, Yu, & Kuehn, 2011), and modeling (e.g., Gamble et al., 2011; Whiteman, Becerra, & Killoren, 2009; Whiteman, Zeiders, Killoren, Rodriguez, & Updegraff, 2014).

Conclusion

The present study adds to a growing literature examining the implications of siblings and sibling relationships for adolescents' well-being and adjustment. Advancing previous work, we examined the time-varying associations between both positivity and negativity in sibling relationships, and adolescents' internalizing symptoms and externalizing behaviors in a sample of working and middle class African American families. Overall, in the face of small declines in their involvement, sibling conflict (but not positivity) served as a unique risk factor for adolescents' adjustment. These findings are notable for two reasons. First, much

of what we know about African American family and sibling influences comes from research on economically disadvantaged families, wherein youth face wide range of challenges to their healthful development. Our results suggest that conflict in sibling relationships can undermine adjustment even in a sample that exhibited fairly low rates of sibling conflict and generally positive adjustment. As such, psycho-educational programs aimed at promoting positive family functioning and youth adjustment in this sociocultural group should explicitly target sibling dynamics and influences. Second, results showing that sibling influences are as strong as parent-child relationship influences suggest that prevention and intervention programs should target sibling relationships. As others have argued, sibling conflict is a key childrearing concern of parents, and sibling relationships may be a non-stigmatizing entrée into the family, motivating parents to involve their family in prevention and intervention programming (Feinberg, Solmeyer, & McHale, 2012). This may be especially so in socio-cultural groups in which sibling relationships are salient and family orientations are strong.

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Biographies

Shawn D. Whiteman is an Associate Professor of Human Development and Family Studies at Purdue University. He received his doctorate in Human Development and Family Studies from The Pennsylvania State University. His major research interests include identifying and understanding the ways in which siblings influence each other's health-risk behaviors and socioemotional adjustment during adolescence.

Ann R Solmeyer is a Post-Doctoral Scholar in the Department of Human Development and Family Studies at The Pennsylvania State University. She received her doctorate in Human Development and Family Studies from The Pennsylvania State University. Her major research interests include family dynamics, sibling relationships, and family-based prevention/intervention programming.

Susan M. McHale is the Director of the Social Science Research Institute and a Distinguished Professor of Human Development and Family Studies at The Pennsylvania State University. She received her doctorate in Developmental Psychology at the University of North Carolina at Chapel Hill. Her major research interests focus on children's and adolescents' family roles, relationships and activities with a particular emphasis on gendered family dynamics and youth's sibling relationship experiences.

Table 1
Means and Standard Deviations for all Time-Varying Independent and Dependent Variables

Variable	Time 1		Time 2		Time 3	
	M	SD	M	SD	M	SD
SibO Positivity	21.82	5.61	20.72	5.10	20.42	5.03
SibY Positivity	21.34	6.37	20.02	5.43	20.23	5.17
SibO Negativity	14.41	4.14	13.54	4.03	13.08	4.16
SibY Negativity	13.51	4.73	13.12	4.48	13.22	5.07
Mother-SibO Acceptance	4.20	0.55	4.07	0.61	4.05	0.63
Mother-SibY Acceptance	4.32	0.52	4.23	0.54	4.19	0.58
Father-SibO Acceptance	3.91	0.67	3.86	0.65	3.90	0.68
Father-SibY Acceptance	4.14	0.55	4.02	0.55	3.93	0.62
Mother-SibO Conflict	27.67	8.63	26.51	8.36	26.14	8.32
Mother-SibY Conflict	26.68	8.25	26.12	8.43	26.23	8.49
Father-SibO Conflict	27.84	10.92	25.34	9.11	25.14	9.96
Father-SibY Conflict	25.33	8.75	24.18	9.32	24.49	8.81
SibO Depressive Symptoms	1.95	2.45	1.96	2.41	1.62	2.17
SibY Depressive Symptoms	1.74	2.30	1.85	2.73	1.75	2.23
SibO Risky Behaviors	25.88	7.07	24.83	6.29	26.75	7.44
SibY Risky Behaviors	--	--	22.15	5.37	23.33	5.21

Note: SibO denotes older sibling and SibY denotes younger sibling.

Table 2
Multi-Level Model Results Predicting Changes in Sibling Positivity and Negativity Across Adolescence

Fixed Effect	Sibling Positivity			Sibling Negativity		
	γ	SE	β	γ	SE	β
Intercept	22.51**	0.81		13.72**	0.63	
Age	-0.38**	0.11	-0.17	-0.24**	0.08	-0.14
Gender	-0.41	0.43	-0.04	0.09	0.35	0.01
Birth order	-1.65**	0.50	-0.15	-1.36**	0.42	-0.15
Sibling dyad gender constellation	-0.76	0.58	-0.07	0.03	0.44	0.00
Biological relatedness of siblings	-0.03	0.75	0.00	0.30	0.57	0.01
Family income	-0.25	0.53	-0.03	-0.02	0.41	-0.01
Parents' education	-0.47*	0.22	-0.15	0.15	0.17	0.05
Parents' marital status	-1.91*	0.96	-0.17	1.14	0.74	0.13
Random Effect	Variance			Variance		
Level 1						
Level 2: Intercept		13.78**			11.05**	
Level 2: Slope		5.20**			3.99**	
Level 3: Intercept		0.35*			---	
		9.33**			4.86**	

Note: Convergence criterion = .001. Age was centered at 13, gender (girl = 0, boy = 1), birth order (0 = earlier-born, 1 = later-born), biological relatedness of siblings (0 = not full biological, 1 = full biological), sibling dyad gender constellation (0 = same-gender, 1 = mixed-gender), marital status (0 = married, 1 = cohabiting/remarried).

* $p < .05$.

** $p < .01$.

Table 3

Multi-Level Model Results Predicting Changes in Youth Depressive Symptoms From Changes in Sibling Positivity and Negativity Across Adolescence, Controlling for Changes in Parent-Child Acceptance and Conflict

Fixed Effect	γ	SE	β
Intercept	0.875***	0.089	
Age	-0.007	0.015	-0.03
B-P sibling positivity	-0.004	0.007	-0.02
W-P sibling positivity	-0.004	0.006	-0.02
B-P sibling negativity	0.047***	0.009	0.23
W-P sibling negativity	0.037***	0.007	0.14
Maternal acceptance	-0.082	0.048	-0.07
Paternal acceptance	-0.062	0.041	-0.05
Mother-youth conflict	0.001	0.003	0.02
Father-youth conflict	0.003	0.003	0.04
Gender	-0.133*	0.058	-0.09
Birth order	-0.025	0.078	-0.09
Biological relatedness of siblings	-0.037	0.075	-0.03
Sibling dyad gender constellation	0.003	0.059	0.02
Family income	0.052	0.058	0.05
Parents' education	-0.028	0.022	-0.07
Parents' marital status	-0.033	0.107	-0.02
Random Effect		Variance	
Level 1		0.303***	
Level 2: Intercept		0.152***	
Level 3: Intercept		0.012	

Note: Convergence criterion = .001. Age was centered at 13, gender (girl = 0, boy = 1), birth order (0 = earlier-born, 1 = later-born), biological relatedness of siblings (0 = not full biological, 1 = full biological), sibling dyad gender constellation (0 = same-gender, 1 = mixed-gender), marital status (0 = married, 1 = cohabiting/remarried). B-P sibling positivity and B-P sibling negativity denotes Level 2 ("between-person;" grand mean centered). W-P sibling positivity and W-P sibling negativity denotes Level 1 ("within-person;" person mean centered).

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

Table 4

Multi-Level Model Results Predicting Changes in Youth Risky Behavior From Changes in Sibling Positivity and Negativity Across Adolescence, Controlling for Changes in Parent-Child Acceptance and Conflict

Fixed Effect	γ	SE	β
Intercept	3.210**	0.031	
Age	0.026**	0.005	0.28
B-P sibling positivity	0.000	0.002	0.00
W-P sibling positivity	0.002	0.002	0.02
B-P sibling negativity	0.007*	0.003	0.11
W-P sibling negativity	0.007**	0.002	0.09
Maternal acceptance	-0.035*	0.016	-0.09
Paternal acceptance	-0.026*	0.013	-0.07
Mother-youth conflict	0.002	0.001	0.06
Father-youth conflict	0.003**	0.001	0.11
Gender	0.073***	0.020	0.16
Birth order	-0.022	0.023	-0.05
Biological relatedness of siblings	-0.072**	0.027	-0.15
Sibling dyad gender constellation	0.009	0.021	0.02
Family income	0.025	0.021	0.08
Parents' education	-0.011	0.008	-0.08
Parents' marital status	0.068	0.039	0.05
Random Effect	Variance		
Level 1	0.020***		
Level 2: Intercept	0.014**		
Level 3: Intercept	0.005*		

Note: Convergence criterion = .001. Age was centered at 13, gender (girl = 0, boy = 1), birth order (0 = earlier-born, 1 = later-born), biological relatedness of siblings (0 = not full biological, 1 = full biological), sibling dyad gender constellation (0 = same-gender, 1 = mixed-gender), marital status (0 = married, 1 = cohabiting/remarried). B-P sibling positivity and B-P sibling negativity denotes Level 2 ("between-person;" grand mean centered). W-P sibling positivity and W-P sibling negativity denotes Level 1 ("within-person;" person mean centered).

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.