

Sibling Influences on Gender Development in Middle Childhood and Early Adolescence: A Longitudinal Study

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Abstract:

The development of gender role qualities (attitudes, personality, leisure activities) from middle childhood to early adolescence was studied to determine whether siblings' gender role qualities predicted those of their sisters and brothers. Participants were 198 firstborn and second-born siblings (Ms = 10 years 9 months and 8 years 3 months, respectively, in Year 1) and their parents. Families were interviewed annually for 3 years. Firstborn siblings' qualities in Year 1 predicted second-born children's qualities in Year 3 when both parent and child qualities in Year 1 were controlled, a pattern consistent with a social learning model of sibling influence. Parental influence was more evident and sibling influence less evident in predicting firstborns' qualities; for firstborns, sibling influences suggested a de-identification process.

Keywords: Adolescent Development | Childhood Development | Sex Role Attitudes | Sex Roles | Sibling Relations | Siblings

Article:

Some of the earliest investigations of sibling influences on social development focused on sex-typing (Brim, 1958; Koch, 1956; Sutton-Smith & Rosenberg, 1970). Early efforts generated a substantial body of research directed at the question of whether the sex-typed qualities of children varied as a function of the sex of their siblings. Investigators sought evidence consistent with predictions from social learning theories that sisters and brothers would model and reinforce their own qualities in their siblings; thus, girls with brothers would develop relatively more masculine qualities, and boys with sisters, relatively more feminine ones. Although studies yielded some support for the social learning hypothesis, overall results were inconsistent, and these studies suffered from a number of methodological and conceptual limitations (A. C. Huston, 1983; Ruble & Martin, 1998). The disappointing pattern of findings may be partly responsible for a virtual 20-year hiatus in research in this area. Informed by significant advances in research on gender development (e.g., A. C. Huston, 1985; Katz & Ksanskak, 1994; Maccoby,

1990; Ruble & Martin, 1998; Serbin, Powlishta, & Gulko, 1993), we revisit in this article the topic of sibling influences on gender socialization. Our approach addresses several important limitations of early studies.

Perhaps the most serious of these limitations was the implicit assumption that siblings of brothers would be exposed to more stereotypically masculine role models, and those with sisters, to more stereotypically feminine ones. Possibly because the development of “sex appropriate” characteristics was seen as a developmental universal (Katz, 1986), sibling influences on gender development were assessed solely as a function of the sex of the sibling, and siblings’ sex-typed characteristics were not measured directly. Researchers studying sibling relationships have emphasized the need to move beyond status variables like the sex of the child in studying sibling influences (Dunn, 1992). In the present study, we examined both the sex of the sibling and siblings’ gender role orientations as potential influences on gender development during middle childhood and early adolescence.

Another drawback of early work on siblings’ role in gender socialization was the failure of early studies to take parental influences into account in explaining similarities (or differences) between siblings. Parental influences may be important in at least two ways. First, correlations between siblings’ sex-typed qualities may arise because both siblings are exposed to the same parental models rather than because siblings learn from one another. Stronger support for the sibling influence hypothesis requires analysis of whether sibling effects are evident beyond the effects of shared parental influences. Second, there are reasons to expect that parental influences may be differentially important for older than for younger siblings. Consistent with the social learning tenet that individuals are more likely to imitate high-status models (Mischel, 1966), some work indicates that siblings search for role models who are higher in the birth hierarchy, with younger siblings more likely to model older siblings than the reverse (Brim, 1958; Bryant, 1982; Rowe & Brit, 1991; Sutton-Smith & Rosenberg, 1970; Tucker, Updegraff, McHale, & Crouter, 1999). A corollary to the idea that individuals look upward toward higher status models is that firstborns may be relatively more susceptible to parental influences. In the present study, we included indices of mothers’ and fathers’ gender roles in the models used to predict children’s gender role orientations in order to test whether sibling effects were significant beyond the predictive power of parental influences, as well as to determine whether parental influences were relatively more important for older than for younger siblings.

Early studies of sibling gender socialization were also limited by their inattention to issues of gender development. In focusing on young children’s stereotypically masculine and feminine personality qualities, researchers treated sex-typing as though it were fixed by the early school-age years (Brim, 1958; Koch, 1956). Recent work, however, has highlighted the dynamic and differentiated course of gender development during middle childhood and early adolescence (Ruble & Martin, 1998). Cognitive developmental changes, for example, allow for more flexible and differentiated gender role concepts during middle childhood and early adolescence and take the form of linear declines in sex-typing (Katz & Ksanskak, 1994; Ruble & Martin, 1998; Serbin

et al., 1993). When secondary sexual characteristics emerge in early adolescence, some youth may be subjected to intensified pressures to conform to sex-stereotypical norms, which may suggest a curvilinear pattern of developmental change (Crouter, Manke, & McHale, 1995; Galambos, Almeida, & Petersen, 1990; Hill & Lynch, 1983). Patterns of developmental change may also vary across different arenas of gender role orientations (e.g., gender attitudes vs. behavioral enactment; Ruble & Martin, 1998), a topic to which we will return.

Our point here is that these developmental patterns may have implications for siblings' relevance as models of sex-typed qualities and behaviors. For example, a child who is in the midst of developing more differentiated cognitions about gender roles may disregard the model provided by an older, adolescent-age sibling who is in the process of conforming to intensified gender socialization pressures. Instead, a developmental perspective would suggest that children will be most likely to look to their siblings as models when their siblings display qualities at a slightly more advanced level (e.g., Rogoff, 1990). Thus, a clearer picture of sibling influences on gender development may emerge when these processes are understood within the context of normative developmental changes. By charting longitudinal changes in the gender role orientations of firstborn and second-born siblings during middle childhood and early adolescence, the present study can also contribute to the literature on gender development, which has sometimes had to rely on cross-sectional data to describe developmental patterns (Ruble & Martin, 1998).

Another reason why a focus on development is important in studying siblings' role in gender socialization is that siblings' developmental status may have implications for their motivation to model their sisters and brothers. Some evidence suggests that sibling "de-identification"—a process proposed in the early writings of Alfred Adler (see Ansbacher & Ansbacher, 1956) whereby siblings develop different qualities and interests in an effort to distinguish themselves from their sisters and brothers—is most apparent in adolescence when youth begin to seek autonomy from their families and identity formation processes are salient (Brody, Stoneman, & McCoy, 1994; Grotevant, 1978). Indeed, sibling influences in adolescence may operate in such a way that sisters and brothers become more different from each other rather than more alike. In the present study we examined sibling influences on the gender development of second-born siblings who were progressing through middle childhood (between approximately 8 and 10 years of age) and firstborn siblings who were moving from middle childhood into adolescence (between approximately 10 and 12 years of age). To the extent that sibling de-identification processes become more prominent in adolescence, these processes should be more evident in the older siblings in our sample.

Finally, a focus on development is important here because longitudinal data can provide stronger support for the sibling influence hypothesis than is possible with a cross-sectional "snapshot." In this study, we explored whether siblings' characteristics predicted those of their sisters and brothers over a 2-year period. To apply a conservative test of the sibling influence hypothesis, we sought to determine whether siblings' gender role orientations in Year 1 of the study

explained variance in children's characteristics in Year 3 beyond the predictive power of children's own characteristics.

Our focus in this study was on sibling influences on gender development in three areas: gender role attitudes, sex-typed personality qualities, and sex-typed leisure activities. Early research on siblings' role in gender socialization focused almost exclusively on sex-typed personality qualities such as expressivity (sensitivity, kindness) or instrumentality (competitiveness, leadership). Focusing only on one area of gender development, however, provides a limited view of sibling influences. Given recent research showing that distinct patterns of change characterize different areas of gender development (Ruble & Martin, 1998) and that, even in adulthood, gender role characteristics remain multifaceted (T. L. Huston & Geis, 1993), we expanded on the earlier focus.

Current research on sex-typed personality characteristics is somewhat limited given a lack of longitudinal data among studies and the variety of methods used (Ruble & Martin, 1998). Extant studies suggest that sex-typing is not clearly apparent until middle childhood; some studies show that sex-typed personality qualities remain stable from childhood to adolescence, but others suggest that these qualities (especially masculine ones) become increasingly sex-typed in early adolescence, presumably because of an intensification in gender socialization pressures (Galambos et al., 1990). In the area of gender role attitudes, extant studies suggest that developing cognitive abilities provide for increasingly more differentiated and flexible conceptions of gender roles as children move into adolescence (Katz & Ksiansnak, 1994); girls' attitudes, however, tend to be less traditional than those of boys (Ruble & Martin, 1998). Researchers interested in gender socialization (e.g., A. C. Huston, 1985) have also argued that sex-typing is manifested most consistently at early ages in children's interests and activities, which are more subject to socialization influences than other domains of sex-typing (Serbin et al., 1993). Extant studies suggest that sex-typing in this domain is relatively stable across middle childhood; when sex differences are found, girls tend to be more flexible than boys, and some work suggests that this flexibility increases in adolescence for girls (Plumb & Cowan, 1984). As we have suggested, these normative patterns of developmental change may have important implications for siblings' relevance as role models.

In sum, the primary goal of this study was to measure the associations between the gender role orientations of firstborn and second-born siblings during middle childhood and early adolescence. In so doing, we moved beyond the focus of early studies on sex-typed personality qualities to examine siblings' gender role attitudes and sex-typed leisure activities as well. To provide a conservative test of the social learning hypothesis of sibling influences on the development of children's gender role orientations, we tested whether siblings' sex, gender role orientations, and the interaction of these two factors explained variance in children's gender orientations beyond that accounted for by children's own characteristics (measured at an earlier time) and the characteristics of their parents. We conducted separate analyses, treating second-borns' and firstborns' gender role orientations as the criterion measures, to test whether the

social learning prediction better applied in explaining the gender role orientations of second-borns as compared to firstborns. We also explored whether firstborns would be more strongly influenced by parents' orientations. To illuminate the developmental context within which sibling influences might emerge, we also describe the nature of the longitudinal changes we observed in firstborn and second-born siblings' gender role orientations within the three domains of interest mentioned previously.

Method

Participants

The data came from the first three phases of a short-term longitudinal study of gender role socialization in middle childhood. The 203 families in the original sample were recruited via letters sent to the families of fourth- and fifth-grade students in 16 rural and small urban school districts of a northeastern state. These letters described the study and criteria for participation; interested families returned a self-addressed postcard, and a follow-up telephone interview determined whether families met the criteria of having a firstborn child in the fourth or fifth grade with a (second-born) sibling 1–3 years younger and an intact marriage. We also sought families in which both mothers and fathers were employed. Confidentiality issues meant that we were unable to determine how many families met study criteria and failed to volunteer, but over 90% of families who returned postcards and met our criteria agreed to participate in the study. Despite screening procedures, 3 families in the larger sample included a sibling older than the two siblings targeted in this investigation; to control for possible birth order effects, we excluded these families from the current analyses. In addition, by Year 3 of the study, 2 additional families had declined participation. Thus, the current analyses are based on 198 families.

Data on the characteristics of these 198 families as measured in Year 1 of the study are provided in Table 1. Reflecting the demographic characteristics of their communities, these families were, with the exception of two adopted Asian children, all White and working class or middle class, and they resided in rural areas, towns, and small cities. All fathers and approximately 90% of mothers in the sample were employed for pay. Further, as indicated in Table 1, the sample was almost evenly divided in terms of the sex composition of the sibling dyad. Two-child families made up almost 60% of the sample; because children in larger families had other siblings as potential models of gender role orientations, we included family size as a factor in all of our analyses. Analyses of the sample characteristics revealed that, with the exception of family members' ages and parents' incomes (which increased about \$2,000 on average from Year 1 to Year 3), there were no differences in family background characteristics across the years of the study.

[Table 1 Omitted]

Procedure

The design involved 3 years of data collection timed to the ages of the firstborn and second-born siblings such that, by the third year of the study, second-borns were approximately the same age as firstborns had been in Year 1. It is important to note that this design did not completely disentangle the confound between age and birth order: If different patterns of sibling influence emerge for firstborns and second-borns, it will not be clear whether differences arise because firstborns are entering adolescence or because they differ from their siblings in birth order.

During each year of the study, we used two procedures for data collection. First, we conducted home interviews with mothers, fathers, and both firstborn and second-born children. These interviews began with a general orientation to the interview procedures. Informed consent then was obtained from each family member, and the family was paid \$100 for participating. Subsequently, family members were interviewed separately about their personal qualities and family relationships.

During the 2–3 weeks following the home interviews, we also conducted seven evening telephone interviews (five on weekday evenings, two on weekend evenings) in which children and parents reported on their daily activities (excluding school and work activities). During each of the seven calls, both firstborn and second-born siblings were asked how many times they had participated in each of 53 activities, including 31 leisure activities (watching TV, playing sports), 12 household tasks (doing dishes, cleaning up room), and 10 personal–social activities (eating a meal, talking on phone), from the time they woke up that morning until the time of the call. These activities were chosen on the basis of the extant research on children’s time use and a pilot study of children in the communities from which we drew our sample. For each activity reported, the child was asked how long the activity had lasted and with whom (e.g., mother, sibling, female peer, adult man) he or she had engaged in that activity. Calls were scheduled in the evenings, shortly before children’s bedtimes so that they could report on almost all of their activities during the day. Mothers and fathers were each interviewed on four of the seven calls. Parents reported on their own household tasks, as well as on the activities they had engaged in with either or both of the target siblings (e.g., leisure activities, meals, help with homework). As an index of interreporter agreement, parents’ and children’s reports of their joint activities were correlated. Family members showed substantial agreement about their activities, with correlations ranging from $r = .60$ ($p < .01$) and $r = .72$ ($p < .01$) for mothers’ and fathers’ shared time with firstborns in Years 1–3, to $r = .52$ ($p < .01$) and $r = .67$ ($p < .01$) for mothers’ and fathers’ shared time with second-borns in Years 1–3.

We used this daily diary procedure rather than observational procedures or rating scale strategies to collect data on the siblings’ activities for several reasons. First, we were interested in low-frequency activities and activities that were undertaken outside the home. Observational investigations typically study children in one setting such as home or school, and even if children are followed for several hours on several days, observers would not be able to capture the range of activities possible in a diary procedure. Rating scale procedures, which also have been used to collect information on children’s activities, require respondents to report on an average day or to

rate how often they usually participate in particular activities, an approach subject to social desirability pressures and memory distortions. We used a cued-recall procedure to question children about specific activities over a relatively short period of time because this approach has been shown to enhance memory accuracy (Schramm, Lyle, & Parker, 1961).

Measures

Home interviews

In addition to providing family background data (e.g., information about their educations, work hours, occupations, and incomes), parents completed three measures relevant to the present analyses. In Year 1, parents' gender role attitudes were assessed with the 15-item Attitudes Toward Women's Roles Scale (Spence & Helmreich, 1972). On this measure, which includes items such as, "Sons in the family should be given more encouragement to go to college than daughters," high scores reflect more traditional attitudes. Cronbach's alphas for the sample were .82 for mothers and .73 for fathers.

Parents' sex-typed personality qualities were also measured in Year 1 with the Bem Sex Role Inventory (Bem, 1985). This measure includes 20 expressive (stereotypically feminine) characteristics ("helpful," "gentle") and 20 instrumental (stereotypically masculine) characteristics ("competitive," "ambitious") that respondents rate on a scale ranging from 1 (*never or almost never true* [of myself]) to 7 (*always or almost always true* [of myself]). Ratings were summed, with high scores signifying more of each sex-typed quality. Cronbach's alpha coefficients were .69 and .75 for mothers' and fathers' expressivity, respectively, and .87 for both mothers' and fathers' instrumentality.

Finally, in Year 1 we also assessed parents' interest in sex-typed leisure activities by means of a measure designed for this study that was adapted from a procedure developed for use with adults by T. L. Huston, McHale, and Crouter (1985). The activities parents rated were the same activities for which children reported their daily involvement during the phone interviews; because we did not obtain data on parents' temporal involvement in leisure activities, we used indices of parents' sex-typed interests in leisure activities as control factors in studying the correlates of children's time in sex-typed leisure activities. Parents rated their interest in each activity on a 4-point scale, and ratings were summed to create indices of parents' interest in stereotypically masculine activities (e.g., competitive sports, hunting and fishing, building models) and stereotypically feminine leisure activities (e.g., dancing, working with handicrafts, coloring, painting, or drawing). On these indices, high scores reflect stronger interests (see McHale, Crouter, & Tucker, 1999, for further details about this measure).

Both firstborn and second-born siblings completed two measures relevant to the present analyses during the home interviews in Years 1, 2, and 3. Children's gender role attitudes were assessed with the Children's Attitudes Toward Women Scale (Antill, Cotton, Goodnow, & Russell, 1994), a measure adapted from the Attitudes Toward Women's Roles Scale used here with

parents. On this measure, children rated, on a 4-point scale, the extent to which they endorsed 19 statements (e.g., “Sons in a family should be given more help to go to college than daughters”). High scores reflect more traditional attitudes. Cronbach’s alphas ranged from .80 to .88.

Children’s sex-typed personality qualities (i.e., expressivity and instrumentality) were measured in each year of the study with the Antill Trait Questionnaire (Antill, Russell, Goodnow, & Cotton, 1993), a 12-item questionnaire in which children used a 5-point scale to rate how well particular traits described them. High scores reflect greater expressivity (e.g., “kind,” “gentle”) and instrumentality (e.g., “competitive,” “adventurous”), respectively. This measure was used because it parallels the personality inventory used with parents (see Antill et al., 1993, for details about scale development and psychometric properties). Cronbach’s alphas for this sample ranged from .48 to .61 for ratings of instrumentality and from .71 to .79 for ratings of expressivity.

Telephone interviews

At each year of the study we created measures of children’s sex-typed leisure activities by aggregating children’s reports across the seven calls to construct indices of the proportion of time (in hours across 7 days) that children spent in the 15 feminine and 6 masculine leisure activities for which parents had reported their level of interest. For the analyses of children’s sex-typed activities, we created scores that reflected the proportion of time children reported spending on feminine and masculine activities relative to the total leisure time they reported.

Results

Overview of Analyses

The results are organized around the three designated domains of gender orientation: gender role attitudes, sex-typed personality qualities, and sex-typed leisure activities. In studying sibling influences in each domain, we began by using mixed-model analysis of variance (ANOVA) procedures to describe normative developmental changes in firstborns’ and second-borns’ gender role orientations across the 2 years of this study; these patterns provide information about the developmental context in which patterns of sibling influence may emerge. We then used hierarchical regression strategies to determine whether sibling characteristics in Year 1 explained variance in children’s gender role orientations across a 2-year period beyond what was accounted for by children’s own role orientations in Year 1 or those of their parents.

First, to study normative patterns of developmental change, we used a series of 2 (family size: 2 children vs. larger families) \times 4 (gender constellation: girl–girl, girl–boy, boy–girl, boy–boy) \times 2 (sibling: firstborn vs. second-born) \times 3 (time) mixed-model ANOVAs (with sibling and time as within-groups factors); the dependent variables were the indices of gender role attitudes, sex-typed personality qualities, and sex-typed leisure activities. To follow up on significant interactions involving the time factor, we examined polynomial trend scores (Girden, 1992; Rovine & von Eye, 1990). Polynomial scores describe patterns of change across the three

waves of data collection. With three data collection points, two change patterns are of interest: linear changes reflect significant differences in role orientations between Years 1 and 3; quadratic patterns reflect a directional change in slope (i.e., U or inverted U-shaped patterns). Family size was treated as a factor in these analyses to test whether children who had only one sibling exhibited different patterns of sibling differences than children who had more than one source of sibling influence.

In the case of sex-typed personality qualities and leisure activities, measures for which we collected information about both stereotypically masculine and stereotypically feminine orientations, we added an additional within-groups factor—domain (i.e., feminine vs. masculine)—to the design. Effects for this latter factor index significant differences between masculine and feminine qualities, or what we have termed stereotypy. Given the complexity of this design, the potential for Type I error if follow-up tests were conducted on all significant effects, and our interest in sibling differences in patterns of change, we report only the highest order Sibling \times Time interactions. Such interaction effects indicate divergent patterns of developmental change for firstborns versus second-borns.

Next, to study the associations between firstborn and second-born siblings' gender role orientations, we used a series of hierarchical regression analyses, exploring whether siblings' sex, siblings' gender role orientations in Year 1, and the interaction between these two factors accounted for variance in children's gender role orientations in Year 3 of the study beyond that explained by a set of control variables, including family size, the gender role orientations of the target child in Year 1, and the gender role orientations of the parents, also measured in Year 1. For each analysis we conducted preliminary correlational analyses between the continuous predictor variables; the highest correlation was $r = .41, p < .01$ (between mothers' and fathers' gender attitudes), and thus we concluded that multicollinearity would not be a problem. For all analyses, siblings' sex was dummy coded as 0 for girls and 1 for boys, and continuous variables were centered when interaction terms were created to reduce multicollinearity (Aiken & West, 1991). Follow-up analyses for significant interactions were based on the guidelines provided by Aiken and West. Given the complexity of these models, we report on all significant predictors in the text and show the results for the final model in the tables only in the case of criterion variables where evidence of sibling influence emerged.

The regression analyses were conducted separately for firstborn and second-born girls and boys. They were designed as a stringent test of a sibling influences hypothesis in that they controlled for both the target child's own orientations and those of the parents. In addition to documenting links between siblings' gender role orientations, we were interested in whether individual differences in second-borns' orientations would be better explained by firstborns' orientations than the reverse; we also wondered whether individual differences in firstborns' orientations would be better explained by parents' orientations than second-borns' orientations would be.

Gender Role Attitudes

Developmental patterns

Results of the mixed-model ANOVAs that focused on siblings' gender role attitudes revealed a significant overall Sibling \times Time effect, $F(2, 186) = 7.34, p < .01$; neither family size nor sibling gender constellation interacted with this effect. As shown in Figure 1, significant linear and quadratic change scores, $F_s(1, 195) = 20.41$ and 9.05 , respectively, $ps < .01$, indicated that firstborns' attitudes became less traditional between ages 10 and 11 but did not change between ages 11 and 12. For second-borns, only the linear effect was significant, $F(1, 194) = 51.25, p < .01$, indicating that attitudes became less traditional between ages 8 and 10. These findings suggest that normative patterns of developmental change serve to make younger siblings, on average, more similar to their older siblings as they approach adolescence. As such, the average older sibling may be a relevant role model for a younger sister or brother, but not the reverse.

[Figure 1 Omitted]

Associations between siblings' attitudes

The results of the hierarchical regressions predicting children's attitudes in Year 3 are shown in Table 2. The results revealed stability in both firstborns' and second-borns' attitudes, as suggested by the significance of the child attitudes in Year 1 measure. In addition, in all cases (firstborn and second-born girls and boys), the final regression models were statistically significant; the factors of interest here accounted for 27–55% of the explained variance, and we found evidence of sibling influences for second-born and firstborn girls and boys.

[Table 2 Omitted]

For second-born girls (see Table 2), child attitudes in Year 1 was a significant predictor in Step 1; in Step 3, the sibling attitudes factor was significant, as was the change in variance (ΔR^2) accounted for, $F(1, 89) = 6.93, p < .01$. In the final model for second-born girls, significant predictors were child attitudes in Year 1 and sibling attitudes in Year 1, $F(7, 88) = 4.56, p < .01$. For second-born boys, the maternal attitudes measure was a significant positive predictor in Step 1, and the sibling attitudes measure proved significant in Step 3. In the final model, boys' own attitudes in Year 1, mothers' attitudes in Year 1, and siblings' attitudes in Year 1 were all significant and positive predictors, $F(7, 91) = 7.98, p < .01$.

Findings for firstborns likewise revealed evidence of sibling influence, though the pattern of associations was quite different than that for second-borns. For firstborn girls, adding sibling sex in Step 2 resulted in a significant change in variance (ΔR^2) accounted for: Girls with younger brothers reported less traditional attitudes than those with younger sisters, $F(1, 96) = 3.82, p < .05$. In the final model, $F(7, 92) = 7.89, p < .01$, a significant predictor was girls' own attitudes in Year 1, and sibling sex remained a trend-level predictor. For firstborn boys, a significant predictor was their own attitudes in Year 1; maternal attitudes also emerged as a significant positive predictor in Step 1. Further, in Step 3, sibling attitudes emerged as a

significant *negative* predictor, $F(6, 88) = 17.62, p < .05$, for ΔR^2 at Step 3. The final model for firstborn boys was also significant: Boys with less traditional mothers and those with more traditional siblings in Year 1 became less traditional over time, $F(7, 87) = 14.98, p < .01$.

In sum, these data provide some evidence of sibling influence: For second-borns, data were most consistent with a social learning model of sibling influence, whereas for firstborns, we found evidence of sibling de-identification. Contrary to our expectations, there was also evidence of parental effects for both firstborns and second-borns, but only in the case of boys.

Sex-Typed Personality Qualities

Developmental patterns

The mixed-model ANOVAs that focused on siblings' sex-typed personality qualities revealed significant linear changes in stereotyping for both firstborns and second-borns, $F(2, 189) = 2.93, p < .05$ for the omnibus Sibling \times Time \times Sex-Typed Domain effect. As seen in Figure 2, while firstborns became more stereotyped in their personality qualities between ages 10 and 12, $F(1, 196) = 3.59, p < .05$, for the linear effect for firstborns, second-borns became less stereotyped during the same period, $F(1, 196) = 5.48, p < .05$, for the linear effect for second-borns. The lowest level of stereotypy was evident for both siblings at approximately 10 years of age. This curvilinear pattern of change is consistent with a gender intensification model of gender development (Hill & Lynch, 1983), but their differing trajectories mean that the average sibling may not provide a relevant role model for his or her sister or brother.

[Figure 2 Omitted]

Associations between siblings' personality qualities

As was the case with gender role attitudes, there was substantial stability in children's personality qualities (standardized betas ranged from .24, $p < .05$, for second-born boys' expressivity to .56, $p < .01$, for firstborn boys' instrumentality). In all cases, this meant that the final overall models were statistically significant, explaining between 16% (firstborn girls' instrumentality) and 38% (firstborn boys' instrumentality) of the variance in children's qualities at Year 3.

The only clear evidence of sibling influence emerged for second-born boys (these findings are shown in Table 3). With respect to expressivity, beyond boys' own expressivity in Year 1, the addition of siblings' expressivity in Step 3 resulted in a significant change in R^2 , $F(1, 93) = 4.51, p < .04$. The final model was statistically significant, $F(7, 92) = 2.41, p < .03$, and suggested that boys whose older siblings were more expressive in Year 1 became more expressive themselves by Year 3. In the case of second-born boys' instrumentality, in Step 1, boys' own qualities in Year 1 and family size were positive predictors. Adding the Sibling Sex \times Sibling Instrumentality interaction in Step 4 resulted in a significant R^2 change, $F(1, 92) =$

5.90, $p < .02$, with follow-up tests suggesting that boys' instrumentality was predicted by the instrumentality of older sisters but not that of older brothers. In the final model, boys' instrumentality in Year 1, family size (second-born boys from larger families were more instrumental), and the Sibling Sex \times Instrumentality interaction were significant predictors, $F(7, 92) = 5.12, p < .01$.

[Table 3 Omitted]

Evidence of parental influences on personality only emerged in one instance: Changes in firstborn boys' instrumental qualities between ages 10 and 12 were predicted by their fathers' instrumental qualities in Year 1 ($\beta = .18, p < .05$). Firstborn boys' instrumentality in Year 1 was the only other significant predictor in this model ($\beta = .56, p < .01; R^2 = .38$), $F(7, 88) = 7.72, p < .01$ (for the final model).

In sum, we found stronger evidence of sibling influence for second-born siblings than for firstborn siblings, but only for second-born boys. Firstborn boys, in contrast, appeared to be susceptible to parental influence, with sex-stereotypical qualities of the same-sex parent (i.e., fathers' instrumentality) predicting similar qualities in sons. Developmental patterns highlighted the divergent trajectories of firstborn versus second-born siblings, which may explain why more evidence of modeling was not apparent; the somewhat low alpha reliabilities for the measure of instrumentality may also have limited our ability to uncover patterns of association.

Sex-Typed Leisure Activities

Developmental patterns

The third domain we studied was children's sex-typed leisure activities. Congruent with previous findings that girls are more flexible than boys in their interest in sex-typed activities (Ruble & Martin, 1998), the mixed-model ANOVAs revealed sex differences in stereotypy, $F(3, 190) = 5.37, p < .05$, for the Gender Constellation \times Sibling \times Time \times Sex-Typed Domain omnibus test (see Figure 3). Follow-up tests revealed no evidence of systematic developmental change during middle childhood for second-borns. In the case of firstborns, however, linear patterns of change for girls and boys diverged over time, largely because girls became less involved in feminine relative to masculine leisure, $F(3, 190) = 5.37, p < .05$, for the Gender Constellation \times Linear Change interaction for firstborns; follow-ups of the gender constellation effect revealed only differences between firstborn boys versus girls. Notably, the pattern for both firstborn girls and boys highlights a focus on relatively more masculine leisure activities. (In these analyses, high and positively signed scores signify more feminine relative to masculine activities for girls and more masculine relative to feminine activities for boys.) As such, masculine activities may be a particularly salient focus for younger siblings' modeling.

[Figure 3 Omitted]

Associations between siblings' leisure activities

These analyses revealed substantial stability for firstborns (standardized betas ranged from .24, $p < .05$, for firstborn boys' feminine leisure to .45, $p < .01$, for firstborn boys' masculine leisure) but less stability in second-borns' leisure (betas ranged from .06, *ns*, for second-born girls' masculine leisure to .27, $p < .05$, for second-born boys' masculine leisure). In turn, each of the final models for firstborns was significant: R^2 ranged from .17, $F(7, 84) = 2.49$, $p < .05$, for firstborn boys' masculine leisure, to .24, $F(7, 93) = 4.31$, $p < .01$, for firstborn girls' masculine leisure. For second-borns, in contrast, the final models for masculine, but not feminine, leisure were significant.

Evidence of sibling influence was most apparent for second-borns but only emerged in the models for masculine leisure (see Table 4). For second-born girls, child masculine leisure in Year 1 was a significant predictor in Step 1; in Step 3, when siblings' masculine leisure was added, the change in R^2 was significant, $F(1, 190) = 8.46$, $p < .01$: Second-born girls whose siblings were more involved in masculine leisure in Year 1 became more involved in masculine activities by Year 3. The final model for second-born girls was significant, $F(7, 89) = 2.81$, $p < .01$, and included one significant predictor: siblings' masculine leisure in Year 1. For second-born boys, child masculine leisure in Year 1 was a significant predictor. Further, adding sibling sex in Step 2 resulted in significant change in R^2 , $F(1, 90) = 4.40$, $p < .03$. The final model for boys also was significant, $F(7, 88) = 2.39$, $p < .05$, and included two significant predictors—child masculine activities in Year 1 and sibling sex—suggesting that boys who had been involved in more masculine leisure at about age 8 and those who had brothers became relatively more involved in masculine leisure by age 10.

[Table 4 Omitted]

For firstborns' leisure activities, we found evidence of sibling influence only for girls' feminine leisure (see Table 4). For these girls, child activities in Year 1 was the only significant predictor in Step 1. In Step 3, adding siblings' feminine activities resulted in a significant change in R^2 , $F(6, 94) = 11.72$, $p < .01$. In the final model, child's activities in Year 1 was a positive predictor and siblings' activities in Year 1 was a negative predictor: Girls who engaged in less feminine leisure in Year 1 and those whose siblings engaged in more feminine leisure in Year 1 became relatively less involved in feminine leisure activities over time, $F(1, 94) = 11.72$, $p < .01$.

For masculine leisure activities, we found evidence of parental influence in only one instance: Firstborn girls whose mothers expressed greater interest in masculine leisure activities in Year 1 showed greater involvement in such activities in Year 3 ($\beta = .20$, $p < .05$). The only other significant predictor in the final model for firstborn girls' masculine leisure was child leisure in Year 1 ($\beta = .41$, $R^2 = .24$), $F(7, 93) = 4.31$, $p < .01$.

In sum, we found evidence consistent with a sibling modeling effect for second-borns and evidence of a sibling de-identification process for firstborns. The only evidence of parental

influence emerged in the analyses that were focused on firstborn girls' masculine leisure activities; mothers' interest in masculine activities was a significant predictor of girls' later involvement in such activities.

Discussion

We charted developmental differences in three distinct dimensions of siblings' gender role orientations—attitudes, personality qualities, and leisure activities—and we tested the hypothesis that siblings' characteristics would explain individual differences in the development of these role orientations during middle childhood and early adolescence. Whereas the pattern of sibling influence on the gender role orientations of second-born children was congruent with social learning processes (second-borns developed in a way that made them more similar to their siblings), the findings for firstborns were consistent with a process of de-identification (firstborns changed in a way that made them different from their siblings). It is noteworthy that we found more evidence of sibling than parental influence for both firstborns and second-borns during this developmental period; further, as anticipated, when evidence of parental influence emerged, it was somewhat more common in firstborns. Concerned that the target siblings in this study might be influenced by other children in their families, we included family size as a control variable in all analyses but found virtually no evidence that this factor had implications for the patterns of results. In the following sections we discuss the implications of our findings for the literatures on gender development and sibling socialization influences. In considering these findings, readers should be mindful that the sample is limited to a White, two-parent, working-class and middle-class sample. Because sibling relationships and gender socialization processes work very differently in different familial and cultural contexts, it will be important to study these phenomena in different social settings.

Developmental Changes in Siblings' Gender Role Orientations Between Ages 8–10 and 10–12

In addition to finding clear patterns of age-related change in gender role attitudes, sex-typed personality qualities, and sex-typed leisure, we also found that change patterns varied across these three dimensions. In the case of gender role attitudes, findings were consistent with a differentiation theory of gender socialization, a perspective which holds that cognitive developmental changes provide for increasingly flexible notions of gender roles (Katz & Ksansnak, 1994; Ruble & Martin, 1998). Our longitudinal and cross-sectional data, in combination, provided information on the attitudes of children from about 8 to 12 years of age. Although girls generally reported less traditional attitudes than boys (especially boys from older brother/younger sister dyads), children's attitudes became less traditional until about 11 years of age, when "differentiation" leveled off. We argue that these normative patterns of developmental change may make older siblings particularly relevant as role models as children approach adolescence.

The findings regarding age-related changes in children's sex-typed personality qualities yielded evidence of a quite different developmental pattern. For second-borns, longitudinal changes were suggestive of a differentiation pattern between 8 and 10 years of age: As a group, these children became less stereotypical in their personality qualities. In contrast, the findings for firstborns were more consistent with a gender intensification model (Hill & Lynch, 1983): Between the ages of 10 and 12, the personality qualities of girls and boys became more stereotypical, with girls reporting that they were increasingly more "kind" and "sensitive" than they were "brave" and "adventurous," and boys reporting the reverse. In combination, the cross-sectional and longitudinal data are suggestive of a curvilinear pattern of change, findings consistent with those of early research (Galambos et al., 1990). As firstborns make the transition to adolescence and become more stereotypical in their personality styles, however, they may become less relevant as role models for their younger siblings, who, on a normative level, are becoming less stereotypical.

Regarding longitudinal changes in children's sex-typed leisure, we found yet another pattern of developmental change. Consistent with extant findings for second-borns, no systematic change between 8 and 10 years of age was apparent, but, beginning at age 10, there were patterns among firstborns of intensification of sex-typed leisure for boys and increasing differentiation for girls (Plumb & Cowan, 1984). That is, both firstborn boys and girls showed increasing involvement in stereotypically masculine relative to feminine activities. These findings are consistent with previous work suggesting that girls in adolescence are more differentiated than boys vis-à-vis their sex-typed interests (Ruble & Martin, 1998). This may make stereotypically masculine activities a more salient focus than stereotypically feminine activities for modeling by a younger sibling.

Taken together, these findings highlight the importance of studying multiple dimensions of children's gender role orientations in the course of development if researchers are to understand just what kind of models siblings provide in their roles as gender socialization agents. As we have noted, our findings of different patterns of change in different arenas were generally consistent with extant findings (Ruble & Martin, 1998), some of which relied on cross-sectional analyses. Further, the pattern of results should not be surprising given that gender roles and attributes do not merge into a single, monolithic attribute in adulthood (T. L. Huston & Geis, 1993). It is important to note here, however, that our evidence on development between ages 8 and 12 is limited because the data are partly cross-sectional. These findings nonetheless represent a contribution to the work on sibling gender socialization influences, which has not examined such processes within a developmental context.

Sibling Influences on Children's Gender Role Orientations

The results support the proposition that siblings influence children's gender development: Siblings' characteristics explained variance in children's gender role orientations across a 2-year period even after we took into account parental influences and children's own qualities. The

pattern of sibling influence, however, differed for firstborns and second-borns, as well as across different dimensions of gender role orientations.

Consistent with social learning predictions regarding the importance of a role model's status, evidence congruent with a modeling process was most evident for second-borns. Indeed, findings showed that older siblings' orientations were more consistent and more powerful predictors of second-borns' gender role attitudes, sex-typed personality qualities, and masculine leisure activities than were those of parents. These results represent an important contribution to the literature on gender socialization, which has paid almost no attention to the role of siblings (Ruble & Martin, 1998). Findings for firstborns, in contrast, provided less evidence of sibling influence, and when sibling effects were apparent, the data were inconsistent with social learning mechanisms of influence. Instead, evidence of sibling de-identification was apparent in the case of firstborn boys' gender role attitudes and firstborn girls' feminine leisure activities: In these instances, developmental changes resulted in firstborns' becoming increasingly less like their siblings. Other evidence of sibling influence for firstborns was the finding that older girls with younger brothers were less traditional in their gender role attitudes; although other interpretations are possible, this finding could be construed as girls' reaction against the potential for a younger brother to be granted special privileges by virtue of his being male. Although we found limited evidence of parental influence overall, firstborns' orientations were linked more often than second-borns' to the orientations of parents, as we had expected; also, whereas firstborns appeared to de-identify with their younger siblings, when links with parents' orientations emerged, they were consistent with social learning mechanisms of influence. In short, these patterns imply that family socialization influences operate differently for firstborn than for second-born siblings.

This strong conclusion must be qualified by an acknowledgment of the limitations of the study's design: Different processes characterizing firstborns' and second-borns' gender socialization may be due to firstborns' status as young adolescents or to their status as firstborns (i.e., a birth order effect). Other investigators have suggested that a focus on autonomy and identity development may elicit de-identification processes in siblings during adolescence (Brody et al., 1994; Grotevant, 1978). In contrast, arguing from a bioevolutionary perspective, Sulloway (1996) highlighted birth order as a significant factor in patterns of sibling influence. From a bioevolutionary perspective, laterborns are considered most likely to exhibit a pattern of de-identification from siblings as they attempt to maximize their share of family resources. The present findings are consistent with the developmental rather than the bioevolutionary prediction and represent an important first step in studying sibling modeling and de-identification processes as they unfold across development. Clearly, however, additional research on this topic is necessary to disentangle the complexities of sibling influences.

In the face of the general patterns of modeling and de-identification, associations between siblings' qualities were more apparent in some dimensions of children's gender role orientations than others. Again, such findings are not surprising given that gendered attributes are not a

monolithic personal characteristic (Ruble & Martin, 1998). We argue here that normative developmental patterns of change, which vary across dimensions of gender role orientations, may make siblings differentially relevant as role models or sources of social comparison. Findings regarding second-borns' gender role attitudes, for instance, provided the most consistent evidence of sibling influence, and it was in this arena that patterns of change for firstborns and second-borns were most similar (i.e., both siblings became less traditional over time). In this case, firstborns may have served as models slightly further along a developmental trajectory that second-borns were traversing. Results also revealed consistent evidence of sibling influence on changes in second-borns' masculine but not feminine leisure. For both firstborn boys and girls, developmental changes resulted in relatively more time in masculine leisure; as such, their sisters' and brothers' involvement in masculine leisure may have been most salient to their younger siblings. The fact that older siblings never showed evidence of modeling their younger siblings is also consistent with the idea that prospective models should display "developmentally relevant" qualities. From a developmental perspective (Rogoff, 1990), siblings older than one's self provide the best role models to the extent that they are slightly more advanced in their development. This is because children may be most attentive to models within their "zone of proximal development." From this perspective, it is not just the status of a model, as social learning theories emphasize, but the developmental relevance of a model that will determine whether he or she is a focus of learning. More so than parents or even peers, a sibling slightly older than one's self may provide the kind of model that falls within a child's "zone" of learning. Not all of our findings were congruent with the idea that older siblings serve as developmentally relevant role models, but our results suggest that future research in this area will be fruitful. Some work highlights the importance of the quality of the sibling relationship in the study of sibling influences (e.g., Dunn & Munn, 1986; Tucker et al., 1999), and this would be another important direction to pursue in delineating the conditions of sibling influence.

Summary and Conclusions

Analyses of change over time revealed differing patterns across different dimensions of gender role orientations, and findings were consistent with previous research in suggesting that no one theory can account for gender development during middle childhood and early adolescence. These developmental patterns of change, however, may help to explain why sibling modeling processes vary between siblings and across domains. Analyses of the associations between children's gender role orientations and those of their siblings likewise imply that no single theory can explain individual differences in children's gender development. Our data suggest that sibling influences operate in ways that make children from the same family both similar (in the case of younger siblings) and more different (older siblings). With this correlational design, inferences of causality are, of course, not possible: Our findings are consistent with theoretical propositions regarding mechanisms of sibling influence, but they are not empirical demonstrations of causality.

At the most general level, the results highlight the complexity involved in studying family influences on children's development. The findings add to this complexity by showing that family socialization processes may work differently for two children from the same family. Most research on child development focuses on one child in a family, with the assumption that processes will be generalizable to all children. The present results imply that the study of siblings is an essential element of research on children's social development.

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