

The Influence of Siblings on Ethnically Diverse Children's Gender Typing Across Early Development

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Most U.S. children grow up with siblings. Theory and prior work suggest that older siblings are important sources of gender-related information and socialization. However, few studies have investigated the patterns of these associations longitudinally across early childhood. The present study examines the influence of sibling presence and gender composition on the trajectory of early gender-typed behavior and appearance in children from age 2 through 6 in a diverse sample of Dominican American (36%), African American (33%), and Mexican American (31%) mother-child dyads ($N = 232$; 112 girls, 120 boys) from low-income households in New York City ($M = \$20,459$, $SD = 14,632$). Results found that children without older siblings spent more time playing with counterstereotypical toys and their mothers' reports indicated similar behavior over the past month (e.g., a girl playing with toy vehicles and balls; a boy playing with toy kitchen sets and dolls) than children with older siblings. Further, children with at least one other-gender sibling (e.g., a girl with an older brother) played more frequently with counterstereotypical toys compared with children with only same-gender siblings (e.g., a girl with only older sisters). Results on the relation between siblings and gender appearance were mixed. Older siblings may thus influence early trajectories of important gender domains (e.g., toy play), which can have various long-term implications for developing skills and interests.

Keywords: siblings, peer socialization, gender typing, early childhood, family context

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From our first years of life, those of us with older siblings avidly watch them. We follow their faces, observe their appearance and behavior, and note their preferences (Best, 2010; McHale et al., 2012). From siblings, we learn about our surroundings and how to engage with the world (Howe & Ross, 1990; Howe et al., 2016). Siblings may also teach us what is considered appropriate for one's gender. Early childhood is a time when young children seek out and acquire knowledge of gender, which subsequently guides everything from the types of peers they pursue to the kinds of activities and play in which they engage (Martin & Ruble, 2010). In seeking out information about gender, a young child may notice that their older sister is painting her nails. The child may then conclude that nail polish is for girls and may want to do the same or avoid nail polish entirely, depending on the child's gender identification. Siblings, thus, may be important and subtle agents of children's gender socialization.

Although anecdotal evidence is abundant, surprisingly little research has empirically tested the influence of siblings on early gender development, particularly prior to age 6. Research on same-aged peers who serve as role models and guardians of gender-normative attitudes and behaviors most often focuses on settings outside of the home (e.g., at center-based care, school, and the playground; Blakemore, 2003; Ewing Lee & Troop-Gordon, 2011). The present study seeks to address this gap by examining relations between sibling constellations and various gender-typing patterns throughout early childhood.

Siblings should be studied more closely in the context of early gender socialization. Demographic data collected between 2002 and 2007 suggest that 82% of U.S. children under the age of 18 live with at least one sibling (Dunifon et al., 2017). Moreover, for the majority of children, siblings are the longest, most intense, and often the most consistent relationship maintained throughout their lives (Dunifon et al., 2017). In fact, the amount of time children spend interacting with siblings is likely equivalent to, or even surpassing time spent with parents (particularly fathers; Dunifon et al., 2017), making siblings one of the most important sources of social information and learning broadly (McHale et al., 2003), and gender, specifically (Farkas & Leaper, 2014).

Despite siblings' dominant presence in many children's lives, a recent meta-analysis on siblings and multiple indices of gender typing found only seven relevant studies (Farkas & Leaper, 2014). These studies overall suggested that children with an older brother

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showed higher masculine-typed qualities, while children with an older sister showed higher feminine-typed qualities (Farkas & Leaper, 2014). While valuable, the meta-analysis had some limitations due to the dearth of studies available. First, the studies varied in the gender typing domains they examined (e.g., traits vs. interests or behaviors). Second, all of the studies were cross-sectional, thus precluding an investigation into whether the relation between siblings and children's gender-typing shows within-child variation by age. Finally, the majority of the studies were on White, middle-class populations, which limited the scope of generalization. The present study addresses these limitations by examining whether the presence and gender of older siblings are associated with young, ethnically diverse children's gender typing across several dimensions (gender-typed play, appearance, and proportion of same-gender friends) longitudinally from ages 2 to 6.

Gender Development in Early Childhood

From birth, young children are socialized into thinking, acting, and feeling in ways that are consistent with culturally prescribed gender roles (e.g., Ruble et al., 2006). Their toys, hairstyles, clothing, behaviors, and language are all marked as gendered, and reinforced by members of their families and communities. The gender-typed attitudes and behaviors children learn in the first years of life continue to influence them through adulthood, organizing their identity and interpersonal relationships in ways that have effects on everything from the skillsets they develop to the opportunities they pursue (Fabes et al., 2004). Gender, thus, is one of the most important social categories shaping human development from infancy to adulthood.

An aspect of gender-typing that has received much attention in the developmental field is play. Specifically, research has long shown that children tend to engage in gender-typed play throughout early childhood (ages 2–6), such that it is common for girls to play with dolls, and for boys to play with trucks (Ruble et al., 2006). Gender-typing, however, can manifest in behaviors and attitudes other than play, such as appearance (“pink frilly dresses”; Halim et al., 2014) and gender-segregated friendships (Fabes et al., 2013). Increasing adherence to gender typing from age 2 to 4 during early childhood is normative and known as gender rigidity (Trautner et al., 2005). However, previous work has also found that the typical curvilinear pattern of gender rigidity followed by flexibility can be subject to variation due to social context (Bennet et al., 2020). One such factor that may influence children's timing and level of gender rigidity, and has yet to be examined, is early childhood sibling constellations.

Sibling Influence on Gender Typing: Theoretical Background

Cognitive theories of gender development posit that as children expand their knowledge of gender, as well as its constancy, they increasingly seek out gender-related information (Ruble et al., 2006). This information is often relayed in social encounters such as those with siblings, and eventually assists children in organizing and categorizing their surroundings (Martin & Ruble, 2010). Moreover, children often observe and imitate gender-related attitudes and behaviors of higher status role models who are typically older (Best, 2010).

Social learning theorists have mostly examined parent-to-child role modeling (Turner & Gervai, 1995), though older siblings also meet the criterion of age-related higher status (Farkas & Leaper, 2014). Indeed, prior work has found that younger siblings are more likely to monitor and model the behavior of older siblings than the other way around (e.g., McHale et al., 2001; Rust et al., 2000). Older siblings may monitor, reinforce, and penalize gender-related attitudes and behaviors in their younger siblings according to gender norms. Finally, not simply the presence of, but also the specific gender configuration of siblings and birth order may affect the nature of sibling influence on children's gender development. Overall, the tenets of cognitive developmental and social learning theories imply that children would primarily acquire gender-related information from older siblings (role models), especially as they become aware of their own gender (e.g., Martin et al., 2002).

Sibling Influence on Gender Typing: Mixed Empirical Results

Based on social and cognitive theories, we would expect children raised with same-gender siblings to show higher levels of gender typing than children raised with other-gender siblings, or no siblings at all. Some researchers have indeed found that children with older same-gender siblings engaged in more gender-typed play and activities and had more gender-typed interests and attitudes than only children and children with other-gender siblings (Farkas & Leaper, 2014; McHale et al., 2001; Rust et al., 2000). Not all studies report the same result, however. For example, some studies of young infants and children, and sometimes only girls (Körner et al., 2020) found that younger siblings acquired behaviors and attitudes similar to those of their older siblings, regardless of their older sibling's gender (Brim, 1958; van der Pol et al., 2016). A larger longitudinal study on preadolescents and adolescents has reported results in the opposite direction, finding so-called “deidentification effects” between siblings (McHale et al., 2001). Such patterns occurred among firstborns but not secondborns. To our knowledge, prior work has not examined sibling effects among children with multiple older siblings. Thus, no studies have considered whether, for instance, third born children are differentially affected by first versus second born older siblings.

A possible explanation for these mixed findings is the lack of longitudinal studies on sibling gender socialization patterns in early childhood and, additionally, a focus on school-age children who may already be part of same-aged peer contexts outside the home. The present study addresses these limitations. Specifically, the influence of older siblings might be more pronounced throughout early childhood, when children are not yet enrolled in school. When children spend most of their time in the home, siblings might become the main, if not only, peer influence. This is why the present study maintains a focus on the early childhood years.

Current Study

We examined the influence of sibling presence and sibling gender composition on children's gender-typed behaviors. Three questions guided our study: (a) Does having older siblings relate to children's gender-typed behaviors? (b) Does the gender of older siblings relate to children's gender-typed behaviors? and (c) Do

sibling effects vary across age throughout early childhood? To test these questions, we gathered information from children and their mothers on children's gender-typed preferences (e.g., toy preference), friends (proportion of same-gender friends), and gender-typed behaviors (observed and reported play, appearance).

Proceeding from prior theory and research, we first compared only children to children with siblings. Then, we compared the following groups with one another: only children, children with older same-gender siblings, children with older other-gender siblings, and children with both older same- and other-gender siblings (hereafter called "mixed-gender siblings").

For sibling presence, we expected children with siblings to play more frequently with gender-typed toys, show more gender-typed toy preferences, have more gender-typed appearance, and have higher proportions of same-gender friends than only children. For sibling composition, we anticipated that children with same-gender siblings would exhibit higher levels of gender-typing patterns, that is, play more frequently with gender-typed toys, and have more gender-typed toy preferences, gender-typed appearance, and higher proportions of same-gender friends compared with the other three categories.

We examined sibling influence on children's gender outcomes in a sample of Dominican American, Mexican American, and African American children from low-income communities residing in New York City. This was an important opportunity because it allowed us to consider families of different backgrounds than are usually studied in developmental science (Henrich et al., 2010; Syed et al., 2018). Moreover, there may be variation in gender typing related to race and ethnic background. Prior work proposes that African American children are largely socialized to endorse gender equality (Hill, 2002) and are relatively flexible and egalitarian in their gender-typing behaviors and attitudes compared with White children (Albert & Porter, 1988). Latinx children, on the other hand, have sometimes shown heightened gender-typing behaviors and attitudes (Bailey & Nihlen, 1990; Halim et al., 2021; Zosuls et al., 2008).

Research on sibling effects on children's gender development from age 2 to the first grade is especially limited in families from BIPOC (Black, Indigenous, People of Color) communities, especially from low-income contexts. The large variability in sibling number, gender, and age that characterized our sample allowed us to test the boundaries of generalization by examining how theories and findings from prior work based on primarily White middle-class samples (which have been largely characterized by small numbers of siblings with narrow age spacing), are expressed in heterogeneous, culturally diverse groups. Moreover, by centering on the experiences and perspectives of minoritized populations, our study aligns with the goal of diversifying developmental theories and research on siblings and gender development, the result of which contributes to an ecologically sensitive science.

Method

Participants

Children ($N = 232$: 112 girls, 120 boys) and their mothers ($M_{\text{age}} = 29.06$, $SD = 5.64$) of Dominican American (36%), African American (33%) and Mexican American (31%) backgrounds participated in a

longitudinal project on cultural and contextual factors that shape children's development from birth until first grade across multiple domains (cognitive, gender, and socioemotional). This study was titled "The Study of Culture, Social Settings, and Child Development Across School Transitions" and approved by New York University's institutional review board, #10-8174. Recruitment occurred in public hospitals in a large, urban, Northeastern U.S. city upon the birth of the focal child. Mothers qualifying for participation were at least 18 years of age, did not reside in a shelter, self-identified as Dominican American, Mexican American, or U.S.-born African American, and had infants born healthy and full-term (birth weight $> 2,500$ g).

The original sample at baseline consisted of 324 mother-infant dyads. Many of families were lost from the study between baseline and the first home visit (which took place at 14 months). For this study, data were drawn from five time points for 232 dyads who were enrolled in the study: when children were aged 2 ($M = 2.06$ years, $SD = .11$), 3 ($M = 3.03$ years, $SD = .14$), 4 ($M = 4.21$ years, $SD = .16$), 5 ($M = 5.16$ years, $SD = .12$), and 6 ($M = 6.59$ years, $SD = .42$). Each time point occurred within a month of the focal child's birthday to yield a narrow age range. At each time point in development, the number of participants who continued with the study ranged from 181–200 due to attrition at different ages. Attrition was mainly due to families relocating to another state, voluntarily dropping out from the study, or being unable to be reached (see [online supplemental materials](#) for more information).

Eighty-seven and a half percent of Mexican American, 64% Dominican American, and 47% African American mothers coresided with the father of the focal child. All of the African American mothers were born in the United States, while Dominican American and Mexican American mothers were mostly born abroad (79.3% of Dominican Americans and 95.7% of Mexican Americans). Mothers were on average 26.14 years ($SD = 5.71$). Participant households had an average annual family income of \$20,459 ($SD = \$14,632$). In terms of education, 70% of Dominican American, 50% of Mexican American, and 65% of African American mothers had completed high school, a GED, or more. Children varied in their center-based care attendance at each age: 17.2% were enrolled at age 2, 18.2% at age 3, 61.6% at age 4, and 90.5% at age 5. At age 6, all of the children were in first grade.

Procedure

Data were collected in children's homes (ages 2–3) and in a university lab (ages 4–6). All interviews with Dominican American and Mexican American families were conducted by bilingual researchers in the dominant language (English or Spanish) of mother and child. Parental consent forms were signed in-person. Mothers received \$75 after each visit.

Measures

Data were collected via parent report, child report, and observations. While some measures were administered at multiple time points, others were only administered once. Our measures were developmentally relevant at each of the time points and have previously been used in research on early gender development (Halim et al., 2013). Decisions on when to administer measures were based on two factors: (a) certain measures were developmentally relevant only at specific ages, and (b) gender was not the only

topic of focus in the larger study, and thus gender-oriented measures were not prioritized at each time point. Associations among the different measures for this sample can be found in prior publications (Halim et al., 2013).

Predictor: Sibling Presence and Gender Composition

At baseline, mothers were asked if they had any other biological children than the focal child, and if so to list each additional child, as well as their age and gender. From mothers' responses, we created two variables. One variable was dichotomous and simply indicated whether the focal child had older siblings or not (no siblings $n = 85$, girls $n = 43$, boys $n = 42$; siblings $n = 142$, girls $n = 67$, boys $n = 75$). The second variable reflected the gender composition of siblings indicating whether the focal child had no siblings ($n = 85$, girls $n = 43$, boys $n = 42$), only older same-gender siblings ($n = 43$, girls $n = 19$, boys $n = 24$), only older other-gender siblings ($n = 60$, girls $n = 26$, boys $n = 34$), or both older same- and other-gender siblings ("mixed-gender"; $n = 37$, girls $n = 22$, boys $n = 15$). Sample sizes for sibling presence ($N = 227$) and sibling gender composition ($n = 225$) were slightly smaller than the total sample ($N = 232$) because of missing data on sibling information from a few mothers at baseline.

Outcomes: Gender-Typed Behaviors

We measured children's gender-typed play preferences using three types of measures: parental report, video-recorded observation of children playing with toys during a structured task in the home, and child-reported preferences.

Mother-Reported Gender-Typed Play. When children were aged 3, 4, and 5, their mothers were asked how often their focal child played with three female-typed items (kitchen/tea/food sets; dolls; soft toys/stuffed animals) and three male-typed items (toy guns/swords; vehicles; balls) over the past month (0 = *never*, 1 = *once or twice*, 2 = *once a week*, 3 = *several times a week* and 4 = *every day*). Toys were specified based on previous studies on children's gender-typed toy play (Ruble & Martin, 1998). Moreover, past research has established that mothers' reports of their children's gender-typed play correlate with teacher ratings of the same behaviors, showing the validity of employing such measures for the purpose of the present study (Golombok et al., 2008). Male- and female-typed items were reverse-coded for the other-gender, and then averaged together with the same-gender items separately for boys and girls. Higher scores indicated more gender-typed play (Age 3 $M = .59$, Age 4 $M = .70$, Age 5 $M = .72$). Averages for gender-typed play for the sample are as follows: age 3 ($M = 2.66$, $SD = .85$), age 4 ($M = 2.20$, $SD = .78$), and age 5 ($M = 2.54$, $SD = .84$). Averages for other-gender-typed play are as follows: age 3 ($M = 1.37$, $SD = .85$), age 4 ($M = 1.22$, $SD = .89$), and age 5 ($M = .98$, $SD = .83$).

Observed Gender-Typed Play. At age 2 and 3, children were video-recorded while engaging in 5 min of alone play with five toys ranging from gender neutral (hand puppet, nesting cups, telephone) to female-typed (baby doll) and male-typed (truck). These toys were chosen as they are commonly played with and recognized by children (Dauch et al., 2018), can be used in pretend play, are prevalent in prior research on gender-typed play (Blake-more & Centers, 2005; Campenni, 1999; Marjanović-Umek, & Fekonja-Peklaj, 2017), and can reveal robust gender differences

(Hines, 2015). Using INTERACT Mangold, coders recorded children's playtime with each toy from the video recordings (see Zosuls et al., 2009 for more details on these procedures). Average reliability for all combinations of coder pairs was calculated via intraclass correlation coefficients ($r = .94$, range = .91–.98). In our analyses, we considered durations of manual contact (touching the toy) with the baby doll and truck respectively. This resulted in two variables for all children: (a) total time spent with same-gender-typed toys (boys playing with trucks and girls playing with baby dolls); and (b) total time spent playing with other-gender-typed toys (boys playing with dolls and girls playing with trucks). Children spent on average 70.61 s ($SD = 69.13$) at age 2, and 72.24 s ($SD = 64.10$) at age 3 playing with same-gender-typed toys. Children's time spent playing with other gender-typed toys averaged 36.50 s ($SD = 44.71$) at age 2 and 34.59 s ($SD = 37.38$) at age 3.

Toy Choice Preference. At age 3, children were shown a photo of a group of boys and a group of girls. While pointing to the picture of the group of boys, the interviewer said "these children picked this toy" and pointed to a yellow, gender-neutral rubber finger puppet toy. The procedure was repeated with the picture of the group of girls, and the same toy but colored orange. Children were then asked which toy they themselves would like (0 = other-gender toy, 1 = same-gender toy). The order of the pictures was counterbalanced for gender. The average toy choice preference for the sample was .56 ($SD = .50$).

Proportion of Same-Gender Friends. When children were ages 2 through 6, their mothers were asked whether their child has "the opportunity to spend time with other children." If their response was positive, mothers were asked to list up to nine peers of their child as well as their gender and age. Mothers were also asked to specify the relationship between the playmate and their child (i.e., is the peer just a friend or also a cousin or sibling). Consistent with prior work on gender segregation (Halim et al., 2013), the present analysis only included nonsibling friends under the age of 10. The proportion of same-gender friends out of the total number of peers listed was calculated at each age ($M = 61.4%$, $SD = 22.8%$). Proportion of same-gender friends for the sample at each age was as follows: age 2 ($M = .57$, $SD = .40$), age 3 ($M = .46$, $SD = .28$), age 4 ($M = .69$, $SD = .27$), age 5 ($M = .74$, $SD = .26$), and age 6 ($M = .73$, $SD = .27$).

This measure has good face validity in that mothers were not primed to think about same-gender friends. Prior work confirms that maternal reports of their children's behaviors (such as peers) show good construct validity, that is, they remain stable over time and correlate with teachers' ratings of the same variables (e.g., Golombok et al., 2008). Moreover, mothers were asked to, one by one, list the peers of their child, followed by their gender, age, and other details. Finally, this measure has previously showed that mothers report higher levels of same-gender friends for their children over time (Halim et al., 2013), which is consistent with patterns in observational studies (e.g., Maccoby & Jacklin, 1987).

Outcome: Gender-Typed Appearance

Coders rated children's gender-typed appearance from the videotaped interviews collected at ages 2–6 based on a previously established and validated coding system (Halim et al., 2013). The appearance measure for girls consisted of eight categories: (a) female-typed clothing (e.g., dresses/skirts); (b) colors (e.g., pink);

(c) hair accessories (e.g., bows, hair bands); (d) patterns or logos (e.g., hearts); (e) fabric or fit (e.g., tulle); (f) trend-conscious styles; (g) formal wear (e.g., patent-leather Mary Janes); and (h) jewelry. For boys, coders proceeded from five categories: (a) male-typed colors (e.g., dark blue); (b) patterns or logos (e.g., cars); (c) fabric or fit (e.g., baggy jeans); (d) sports-themed styles (e.g., basketball tanks); and (e) formal wear (e.g., ties).

A gender-typed appearance element was coded as either not present (= 0) or present (= 1) and scores were summed separately for girls (max. score = 8, $M = 3.29$, $SD = 1.66$) and boys (max. score = 5, $M = 2.29$, $SD = .99$). Average gender-typed appearance for girls at each age was: age 2 ($M = 2.70$, $SD = 1.53$), age 3 ($M = 3.31$, $SD = 1.35$), age 4 ($M = 3.72$, $SD = 1.95$), age 5 ($M = 2.85$, $SD = 1.53$), and age 6 ($M = 2.70$, $SD = 1.30$). Average gender-typed appearance for boys at each age was: age 2 ($M = 1.41$, $SD = 1.01$), age 3 ($M = 2.53$, $SD = .93$), age 4 ($M = 2.41$, $SD = 1.05$), age 5 ($M = 1.98$, $SD = .89$), and age 6 ($M = 1.98$, $SD = 1.07$).

Girls showed a greater selection of gender-typed appearance elements to code for than boys and their score range was thus wider. Thus, Z-scores were centered on the grand mean across time separately for boys and girls, and then combined into one variable. Interrater reliability ranged from .80–1.00. Past studies have supported the validity of this measure finding meaningful patterns and connections with gender knowledge (Halim et al., 2013).

Demographic Information

Demographic information pertaining to siblings was collected at every wave. At baseline, mothers were asked to report the birth order of the focal child. At each subsequent age, mothers were asked about the following information: (a) total number of people living in the household; (b) total number of children living in the household (siblings of any age, stepchildren, or other household members under 18), and (c) cohabitation with older sibling (whether the focal child's older siblings live in the household).

Analysis Plan

Prior to conducting the main analyses, we performed descriptive statistics on sibling variables and compared them across ethnic groups. For the main analyses, results are organized by outcome. For each outcome, we tested whether sibling presence (only children vs. have at least one older sibling) and sibling gender composition (only children vs. same-gender siblings vs. other-gender siblings vs. mixed-gender siblings) related to children's gender typing.

Measures that were administered at three or more time points (mother-reported gender-typed play, observed gender-typed appearance, proportion of same-gender peers) were analyzed using multilevel modeling, which allowed us to include participants with missing data. For each model, we first calculated Type III sums of squares to indicate overall omnibus fixed effects for sibling presence and gender composition. Fixed effects included sibling variables (presence or gender composition), time (linear and quadratic components), gender (female reference group), ethnicity (Dominican American reference group), and interactions between sibling variables and time (linear and quadratic) among the variables. A random participant intercept effect was also included. For detailed model coefficients and formulas see (Halim et al., 2013). We treated gender and ethnicity as factors and time as a covariate, and we assumed that the residuals were

uncorrelated and homoscedastic over time. We did not have the statistical power to test interactions between gender and sibling presence, and gender composition, or between ethnicity, sibling presence, and gender composition in our analyses. General time effects are not reported here, as they were not the main focus of our study and have been reported in a previous publication (Halim et al., 2013). For variables that were administered at only one or two time points (observation of gender-typed play, toy choice), we conducted independent samples t-tests with sibling variables (presence and gender composition) as independent variables.

Results

Descriptive Statistics of Sibling Variables and Ethnic Group Comparisons

Children with siblings had on average 1.98 siblings ($SD = 1.42$). African American children ($M = 2.55$, $SD = 1.98$) had more siblings, on average, than Dominican American children ($M = 1.57$, $SD = .76$), $p < .05$, and Mexican American children did not differ from the other two ethnic groups ($M = 1.90$, $SD = 1.22$). The median birth order was two ($M = 2.25$, $SD = 1.48$). Birth order did not vary by ethnicity. Chi-square tests of independence indicated no significant ethnic differences in sibling presence, $\chi^2(2, N = 227) = 4.82$, $p = .09$, or sibling gender composition, $\chi^2(6, N = 227) = 7.19$, $p = .30$.

Next, we explored whether demographic variables (birth order, cohabitation with older sibling, household size, and number of children living in the household) related to gender outcomes using Pearson's bivariate correlations. These analyses were conducted only on children with siblings. Most comparisons were not statistically significant (see Supplemental File 1, Table S1). Given these demographic variables were largely confounded with sibling presence, as well as not consistently significantly related to gender outcomes (significant correlations were few and were not consistently significant across development), we did not examine them further. Finally, we conducted exploratory analyses to examine if gender outcomes varied as a function of the age spacing between older siblings and the focal child. Out of the five outcome measures we examined, only two outcomes (only at two waves) showed variability based on sibling age spacing (see Supplemental File 2). This suggests that the findings in our study are robust and generalizable across families where sibling age gaps are closer or farther apart.

Influence of Siblings on Children's Gender-Typed Play

Estimated marginal means and standard errors for multilevel modeling analyses by wave and sibling presence and sibling gender composition are reported in Tables 1–2.

Mother-Reported Same-Gender-Typed Play and Other-Gender-Typed Play

Mother-reported same-gender and other-gender-typed play did not vary by sibling presence (Figures 1–2). With regards to sibling gender composition, we hypothesized that children with older same-gender siblings would play more frequently with gender-typed toys (and less frequently with other-gender-typed toys) than only children and children with other sibling gender compositions.

Table 1
Means (and Standard Deviations) for Outcome Variables by Sibling Presence

Sibling presence	Gender-typed behaviors and preferences						Proportion of same-gender friends
	Play: Mother reported		Play: Observed		Toy choice	Appearance	
	Same gender	Other gender	Same gender	Other gender			
No siblings							
2 years			76.60 (66.87)	40.18 (51.29)		1.87 (1.51)	0.63 (.32)
3 years	2.60 (.76)	1.32 (.73)	63.74 (60.26)	43.21 (41.70)	.44 (.50)	2.87 (1.07)	0.53 (.27)
4 years	2.59 (.83)	1.15 (.95)				3.30 (1.79)	0.69 (.25)
5 years	2.41 (.94)	0.84 (.81)				2.48 (1.20)	0.76 (.25)
6 years						2.31 (1.21)	0.73 (.25)
Siblings							
2 years			66.55 (70.76)	34.00 (39.78)		2.23 (1.40)	0.53 (.35)
3 years	2.71 (.91)	1.40 (.92)	76.92 (65.98)	29.85 (34.10)	.63 (.49)	2.96 (1.32)	0.42 (.28)
4 years	2.77 (.75)	1.26 (.85)				2.85 (1.58)	0.70 (.29)
5 years	2.63 (.78)	1.08 (.83)				2.34 (1.38)	0.73 (.27)
6 years						2.36 (1.27)	0.74 (.29)

Results for other-gender-typed play partially supported our hypotheses, as indicated by a main effect of sibling gender composition on children's other-gender-typed play, $F(3, 478.8) = 5.01$, $p = .002$. Across ages 3 through 5, children with same-gender siblings engaged less frequently in other-gender-typed play compared with all three other groups (p 's $< .05$). Children with mixed-gender siblings were higher on other-gender-typed play than only children ($p = .043$); see Figures 3–4.

Observed Gender-Typed Object Play

We expected children with same-gender siblings to spend more time playing with same-gender objects and less time playing with other-gender objects during the structured play task compared with only children

and children with other-gender and mixed-gender siblings. In partial support of our hypotheses, analyses indicated a significant effect of sibling presence on other-gender-typed play at age 3: Only children touched other-gender objects longer ($M = 43.21$, $SD = 41.70$) than children with siblings ($M = 29.85$, $SD = 34.10$), $t(139) = 2.05$, $p < .05$. Observed gender-typed play did not vary as a function of sibling gender composition. Comparisons at age 2 were not significant.

Toy Choice Preference

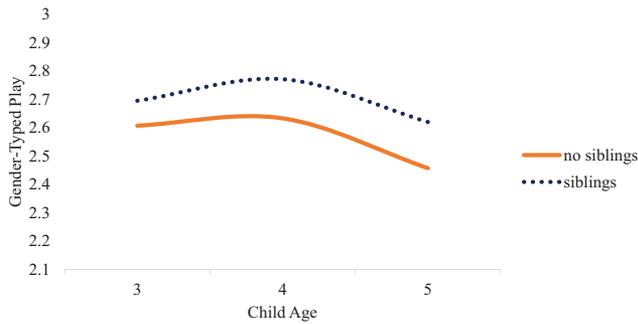
As expected, children with siblings were indeed more likely to choose a gender-typed toy ($M = .63$, $SD = .49$) than only children ($M = .44$, $SD = .50$), $t(155) = 2.37$, $p < .05$. With regards to sibling gender composition, we hypothesized that children with same-

Table 2
Means (and Standard Deviations) for Outcome Variables by Sibling Gender Composition

Child age	Gender-typed behaviors and preferences						Proportion of same-gender friends
	Play: Mother reported		Play: Observed		Toy choice	Appearance	
	Same gender	Other gender	Same gender	Other gender			
			Same gender				
2 years			60.75 (61.72)	41.18 (44.25)		2.19 (1.40)	0.53 (.37)
3 years	2.86 (.80)	1.12 (.67)	81.25 (60.03)	39.91 (42.81)	.69 (.47)	2.97 (1.23)	0.52 (.29)
4 years	2.61 (.55)	0.82 (.68)				2.61 (1.34)	0.71 (.27)
5 years	2.38 (.64)	0.77 (.67)				2.00 (1.33)	0.74 (.28)
6 years						2.00 (.96)	0.73 (.33)
			Mixed gender				
2 years			68.40 (73.26)	24.34 (33.58)		2.11 (1.51)	0.54 (.37)
3 years	2.55 (1.08)	1.52 (.98)	84.07 (77.71)	23.91 (28.51)	.68 (.47)	3.00 (1.21)	0.39 (.29)
4 years	2.79 (.78)	1.41 (.85)				3.02 (1.87)	0.65 (.34)
5 years	2.68 (.91)	1.25 (.87)				2.67 (1.33)	0.74 (.23)
6 years						2.43 (1.42)	0.77 (.27)
			Other gender				
2 years			66.39 (77.81)	40.50 (43.06)		2.47 (1.27)	0.51 (.32)
3 years	2.78 (.77)	1.53 (1.03)	66.93 (59.77)	29.27 (30.78)	.53 (.51)	2.94 (1.58)	0.37 (.24)
4 years	2.92 (.91)	1.67 (.81)				2.88 (1.40)	0.79 (.21)
5 years	2.88 (.63)	1.19 (.90)				2.23 (1.48)	0.68 (.34)
6 years						2.67 (1.24)	0.71 (.28)

Note. Descriptive statistics for children with no siblings are presented in Table 1.

Figure 1
Means of Gender-Typed Play Over Time by Sibling Presence



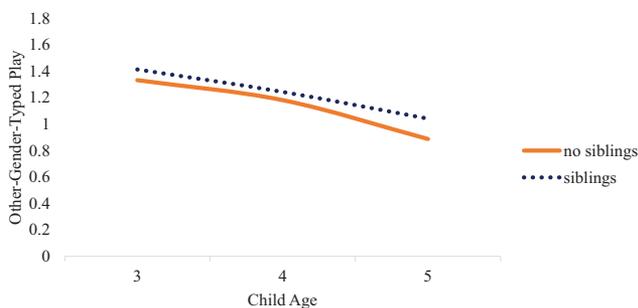
Note. See the online article for the color version of this figure.

gender siblings would show more gender-typed toy preferences compared with children with other-gender siblings, mixed-gender siblings, and only children. Analyses for sibling gender composition were marginally significant, $F(3, 151) = 2.48, p = .06$. As expected, children with same-gender siblings were most likely to choose a gender-typed toy ($M = .69, SD = .47$), followed by children with other-gender siblings ($M = .68, SD = .47$), mixed-gender siblings ($M = .55, SD = .51$) and only children ($M = .44, SD = .50$).

Influence of Siblings on Children's Proportion of Same-Gender Friends

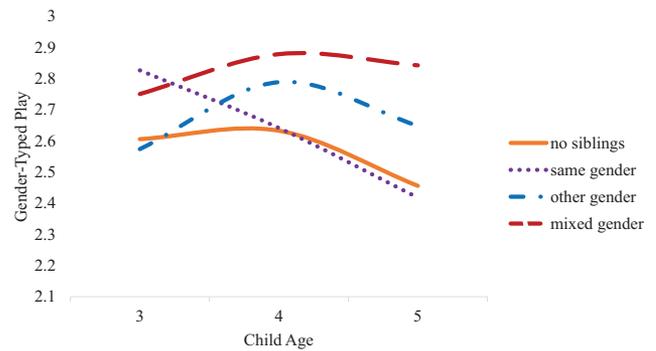
We hypothesized that children with siblings would have a higher proportion of same-gender friends than only children because the presence of siblings was expected to make gender more salient. Results from the mixed model surprisingly showed a reverse pattern: Only children were reported to have a higher proportion of same-gender friends than children with siblings. These differences were only evident at ages 2 and 3 (age 2: $p = .012$, age 3: $p = .028$; sibling presence by time (linear) interaction: $F(1, 682.9) = 5.74, p = .017$, however, with null results when children were ages 4–6: p 's = .345–.957 (see Figures 5–6).

Figure 2
Means of Other-Gender-Typed Play Over Time by Sibling Presence



Note. See the online article for the color version of this figure.

Figure 3
Means of Gender-Typed Play Over Time by Sibling Gender Composition



Note. See the online article for the color version of this figure.

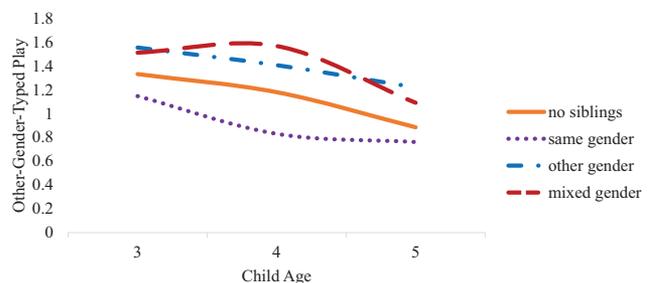
Influence of Siblings on Children's Gender-Typed Appearance

We expected that children with older siblings would show earlier gender-typed appearance than only children. Moreover, we expected that children with same-gender or mixed-gender older siblings would show more gender-typed appearance than children with other-gender siblings and only children.

The mixed model revealed a significant sibling presence by time (quadratic) interaction, $F(1, 705.0) = 5.04, p = .025$ (Figure 7). Follow-up analyses indicated that groups differed at the first wave when children were 2 years old, $F^{T1}(1, 837.3) = 6.45, p = .011$, and not in other waves ($ps > .17$). At age 2, children with siblings were higher on gender-typed appearance than only children ($p = .011$), consistent with the first prediction.

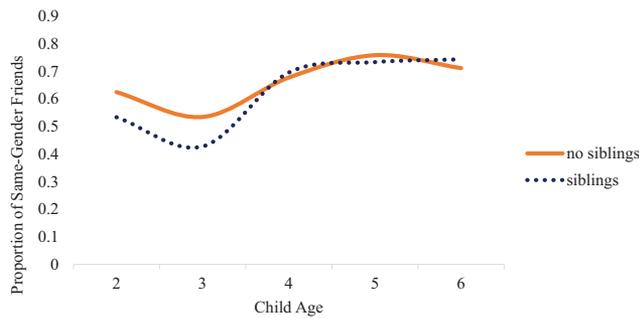
The mixed model also revealed a sibling gender composition by time (quadratic) interaction, $F(3, 700.3) = 2.89, p = .035$ (see Figure 8). Consistent with the sibling presence analysis, follow-up analyses indicated a marginally significant sibling gender composition difference in gender-typed appearance at age 2, $F^{T1}(3, 827.9) = 2.60, p = .051$. Posthoc analyses indicated that, as expected, at 2 years of age, children with mixed-gender siblings were higher on gender-typed appearance than only children ($p = .011$). Unlike the sibling presence analysis, however, significant

Figure 4
Means of Other-Gender-Typed Play Over Time by Sibling Gender Composition



Note. See the online article for the color version of this figure.

Figure 5
Means of Proportion of Same-Gender Friends Over Time by Sibling Presence

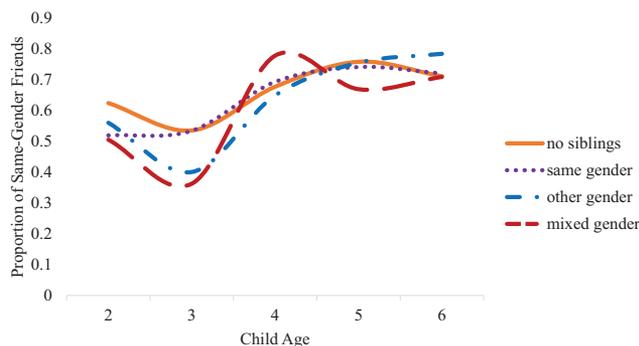


Note. See the online article for the color version of this figure.

differences were also found between gender composition groups at age 4, $F^{T3}(3, 603.7) = 2.80, p = .039$, and age 5: $F^{T4}(3, 443.1) = 3.19, p = .024$, but in the opposite direction to predictions. At age 4, children with other-gender siblings and only children showed the highest levels of gender-typed appearance (all pairwise comparisons $ps < .05$ except only vs. mixed-gender, $p = .062$). At age 5, children with other-gender siblings continued to show the highest level of gender-typed appearance, significantly greater than children with only same-gender siblings ($p = .008$). There was no sibling gender composition effect on gender-typed appearance at age 3 or 6 ($ps > .47$).

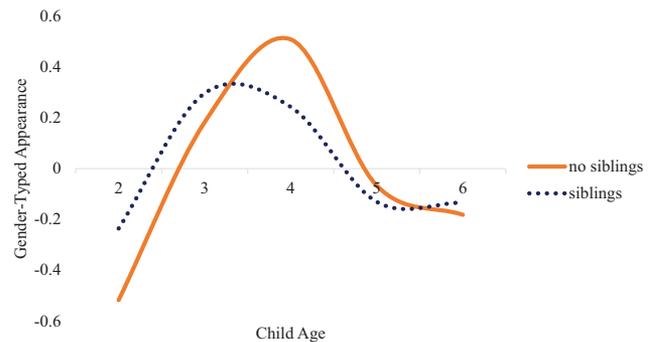
In order to test more closely the second prediction concerning differences across gender composition, we examined the trajectories of the four groups across age. Although all groups followed a similar curvilinear trajectory of increases then decreases in gender-typed appearance, interestingly, only children and children with only other-gender siblings showed the most change. Only children rose sharply in gender-typed appearance from ages 2 to 4, (significant p only between ages 2 and 3 = .005), and their peak was higher than that of other children. Children with other-gender siblings showed a similar dramatic increase from age 2 to 3 ($p = .030$). In contrast, children with at least one older same-gender sibling (only same-gender or mixed-gender) showed gentler peaks and declines over time (no significant changes in gender-typed appearance from one age to another).

Figure 6
Means of Proportion of Same-Gender Friends Over Time by Sibling Gender Composition



Note. See the online article for the color version of this figure.

Figure 7
Means of Gender-Typed Appearance Over Time by Sibling Presence



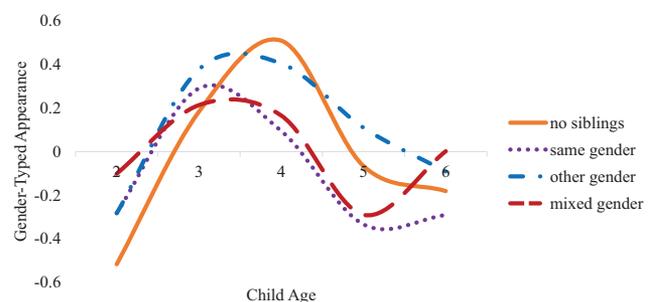
Note. See the online article for the color version of this figure.

In short, the presence of siblings and sibling gender composition did matter for gender-typed appearance as expected at age 2 (children with siblings were higher on gender-typed appearance than only children), but not in the predicted direction after age 3. The curvilinear pattern for children with no siblings or other-gender siblings was similar and showed a more pronounced increase in gender-typed appearance than the pattern for children with same- or mixed-gender siblings.

Discussion

This study was the first, to our knowledge, to longitudinally examine how sibling presence and gender composition relate to gender-typed preferences and behaviors among ethnically diverse children across ages 2–6. Sibling influence is a difficult topic to study, given the complexities of sibling constellations, and the characteristics of the family system in which siblings are embedded. Despite such complexities, our results showed that having siblings was associated with several domains of gender-typed behavior (gender-typed play and toy choice, gender-typed appearance, and proportion of same-gender friends). Specifically, findings are in line with aspects of cognitive developmental and social learning theories, and previous work suggesting that older siblings can function as role models and teachers for their younger siblings (Farkas & Leaper, 2014; Howe & Ross, 1990; McHale et al.,

Figure 8
Means of Gender-Typed Appearance Over Time by Sibling Gender Composition



Note. See the online article for the color version of this figure.

2001). Overall, our work contributes to the mixed body of literature addressing sibling influence on gender typing, corroborating the recent meta-analysis showing an overall positive association between the presence of siblings and children's gender typing (Farkas & Leaper, 2014).

Domain-Specific Sibling Effects

The strength of the relation between sibling presence and gender composition and gender outcomes varied depending on the domain of gender-typing. Sibling effects were the most pronounced for mother-reported gender-typed play, and more specifically, children's play with other-gender-typed toys. Only children spent more time playing with other-gender-typed toys than children with siblings and were less likely to choose a same-gender-typed toy. Moreover, children with same-gender siblings engaged less frequently in other-gender-typed play compared to children with other sibling-gender composition categories (mother-report measure). These findings are in line with our hypotheses and prior studies which show that children with same-gender siblings are on average more likely to avoid other-gender-typed play (Rust et al., 2000), and instead engage in more gender-typed play (observed) and have more gender-typed interests than only children and children with other-gender siblings (Farkas & Leaper, 2014). The avoidance of other-gender-typed play may be amplified by an increased exposure to same-gender-typed play behavior and toy preferences, and a decreased exposure to other-gender-typed play and toys, resulting from the presence of a same-gender sibling. In addition to exposing younger siblings to gender-typed play, same-gender older siblings may police gender-related behaviors of younger siblings, which could lead the latter to avoid other-gender-typed play and toys (Martin & Ruble, 2010).

Regarding gender-typed appearance, although trajectories across children followed a similar curvilinear path, children peaked at different age points depending on their sibling constellation. For instance, only children started out lowest on gender-typed appearance at age 2, but quickly surpassed other children by the time they reached age 4. This comparatively later peak in gender-typed appearance for only children is surprising and could perhaps be explained by only children being exposed to same-aged peers at later ages, or less frequently than children with siblings. Only children may thus not perceive, or attend to gender-based appearance differences as early as children with siblings, and consequently peak later in their appearance rigidity (Halim, 2016; Halim et al., 2014). We also found that only children had a higher proportion of same-gender friends than all other sibling configuration groups (same-gender; other-gender; and mixed-gender), which did not align with our initial hypothesis. It could be that only children, although not subject to the gender typing of siblings, instead are influenced by same-gender and same-aged peers they interact with through play dates arranged by their parents.

Interestingly, our data show that at age 3, children with mixed-, and other-gender siblings were reported by their mothers to have a majority of other-gender friends (61%–63%) on average. Having a majority of other-gender friends is indeed unusual given the predominance of same-gender friends in childhood and throughout the life span (Mehta & Strough, 2009). However, by age 4 sibling configuration groups converged. Perhaps, at earlier ages, children are often exposed to and engaged in play with the friends of their

older siblings. These patterns may level off at later ages due to children's enrollment in preschool, where a larger quantity of mixed-gender peers are available. Alternatively, and consistent with cognitive developmental theories, children without older siblings may "discover" gender on their own, potentially resulting in a heightened need to make sure they are "doing gender" correctly (Martin & Ruble, 2010).

Age-Specific Sibling Effects

The longitudinal nature of our dataset allowed us to test whether siblings influenced children's gender development across the years of early childhood. Our results generally showed a more consistent influence of siblings on children's gender typing at ages 2–4 across various aspects of gender typing, with fewer sibling effects found at ages 5 and 6. Stronger sibling effects at earlier time points may be explained in part by children's expanding microsystems over the course of development (Bronfenbrenner & Morris, 1998). When children are 2 and 3, they likely spend more time at home, with ample opportunities to interact with their siblings. As children enter center-based care and school settings, their social networks grow and diversify, thereby expanding their microsystems and increasing the types and number of sources of gender-socialization. Sibling effects, in turn, may explain smaller portions of variance in children's gender typing as children get older. Indeed, center-based care enrollment in our sample was low at ages 2 (17.2%) and 3 (18.2%), thus lending support to the theory of children's expanding microsystems dampening the magnitude of sibling effects in early childhood.

Sibling Relations in a Cultural Context

Our findings suggest that older siblings may be regarded as powerful sources of gender socialization for younger children among ethnically diverse families, a finding in line with much of prior work on sibling relations across cultures. Sibling relationships vary by cultural context, evolve over time, and shape the responsibilities that parents distribute to children based on sibling gender and birth order (Maynard, 2019). In Latinx communities, gender constructs such as machismo (men as dominant, hypermasculine, chauvinistic, aggressive, and sexist), caballerismo (men as chivalrous, family-centered, and nurturing), and marianismo (stresses that women should be submissive, chaste, spiritual, family-centered, and sacrificial) prescribe distinct status and roles to males and females (Arciniega et al., 2008; Castillo et al., 2010). In contrast, scholars find that African American communities are likely to endorse the ideal of equality as an American value (Tamis-LeMonda & McFadden, 2009), promote gender egalitarian attitudes and behaviors, and display less explicit gender socialization than White families (Hill, 2002; Peters, 1997), although conclusions are mixed (Skinner et al., 2016).

These ideologies may be reflected in the endorsement of more distinct gender roles and in gender socialization practices that differentiate girls and boys. For instance, in many Latinx and African American communities, older daughters are raised to take care of others in the household, which suggests they may be given more opportunity to socialize gendered roles to their younger siblings (Watson & McGoldrick, 2011). Among many Mexican-origin families with hierarchal family structures, older siblings are often

provided more authority and higher status than younger siblings, thus serving as important socialization agents and role models for their younger siblings (Knight et al., 2011; Rodríguez De Jesús et al., 2019). Future studies should examine cultural variations in family structure and dynamics, and how the differential responsibilities and regard of older siblings may shape children's gender development.

Limitations and Future Directions

Several limitations are worth mentioning. We did not collect any data from older siblings directly and thus do not have information on the trajectory of siblings' gender-typing attitudes and behaviors. In forming our hypotheses, we also made the assumption that the majority of siblings are, on average, gender normative, which is consistent with past literature (Golombok et al., 2008). However, we acknowledge that many siblings might be gender-variant, such as a tomboy older sister, and provide different forms of socialization (Körner et al., 2020). Our measure of sibling relationships was also broad, capturing the presence and gender composition of siblings. We did not have information about the nature of sibling interactions in the context of the family, nor whether sibling interactions vary as a function of age spacing, gender, birth order, setting, and cultural context. Moreover, we did not have information about how parents' gender socialization varied by each sibling in the family. Relatedly, we did not have the power in our sample to test whether older brothers influence younger female and male siblings differently from older sisters. Due to the elevated cultural status of maleness and masculinity in most societies, older brothers may be awarded higher standing also within the family, and thus be more attractive as role models to both male and female younger siblings (Farkas & Leaper, 2014). Future studies should examine relations between siblings and gender development using more detailed measures, such as observations of sibling interactions, and detailing the types of sibling influences by selecting samples that are matched by birth order, gender, and age spacing (McHale et al., 2001).

We did not have the power to examine whether ethnicity moderated the relation between sibling variables and children's gender-typing. Ethnic groups across the world vary in the roles they assign to and the expectations they hold for siblings in the household (Updegraff et al., 2011; Schroeder & Bámaca-Colbert, 2019), both of which may shape how gender is learned. The relation between siblings and gender-typing may relate to other important demographic factors (e.g., immigration status, family structure and dynamics, cultural upbringing), as well as transitions across the life span (e.g., entry into school, parental divorce), suggesting that sibling relations are complex and varied across individual households and cultural communities (e.g., Hafford, 2010; Maynard, 2004). Finally, we only focused our study on older siblings. The presence of younger siblings might change dynamics and interactions between family members in meaningful ways and offer insights into the relation between gender socialization and birth order.

Implications

These findings have implications for research as well as practice. For scholars, our study points to the importance of examining the developing child in the context of the family system. Developmental

trajectories of children's gender-typing are shaped by the constellation of factors comprising sibling dynamics, such as age and gender, as well as individual siblings' resistance or accommodation to family or cultural norms around gender. Moreover, while young children may be particularly susceptible to gender-related cues in their environment, the type of cues they receive and perceive from siblings may be directly and indirectly facilitated by parents. Thus, an examination of children's gender development is enhanced by the inclusion of siblings.

Our findings also have implications for interventionists and policymakers seeking to promote positive literacy and math outcomes for young children. Both domains of learning are gendered subjects in U.S. society that emerge in early childhood and widen over the course of development (e.g., Eliot, 2009). For example, prior work has found a positive relation between gender-typing and the amount of time children spend playing with Legos, blocks, and trucks, toys which are typically stereotyped as male, and their later science, technology, engineering, and mathematics (STEM) abilities (e.g., Jirout & Newcombe, 2015; Verdine et al., 2014). Similarly, prior studies have suggested that activities that encourage pretend play, typically stereotyped as female, are related to symbolic thinking and later narrative abilities (Bergen, 2002; Hoffman & Russ, 2012). To the extent that early interactions around toys may be shaped by older siblings, they may have cascading effects on later STEM and literacy abilities, which can feed into larger gender inequities (Leaper, 2015). In short, our work suggests that the child is not simply a solitary unit raised in isolation, but rather, is a participant in a family system characterized by evolving, dynamic relations that vary according to the family structure, cultural context, and time point in development.

Conclusion

For most people across the world, sibling relationships are one of the longest and most important social relationships we have throughout the life span. Despite their ubiquity, siblings are understudied in developmental science more broadly, and research on gender development specifically. Our findings show that the presence of older siblings is an important factor in children's gender-typed play, toy preferences, appearance, and proportion of same-gender friends. Our findings also suggest that the strength and nature of sibling influence vary considerably depending on children's age.

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