

Sibling Gender Configuration and Family Processes

Journal of Family Issues

1–23

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DOI: 10.1177/0192513X15572369

jfi.sagepub.com



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Abstract

The current study focuses on the effects of sibling gender configuration on family processes during early childhood. In a sample of 369 two-parent families with two children (youngest 12 months, oldest about 2 years older), both siblings' noncompliant and oppositional behaviors and fathers' and mothers' sensitivity and discipline strategies were observed. Both siblings' aggressive behaviors and empathy of the oldest sibling were assessed with parent-reports. Children in families with two sons showed more problematic interaction patterns compared with children in families with an oldest girl. In families with two boys, older siblings were more aggressive and fathers were less sensitive toward their youngest child in comparison with families with two girls. Furthermore, in boy–boy families older siblings showed more oppositional behavior and younger siblings more noncompliance compared with girl–boy families. These findings highlight the importance of sibling gender configuration in the development of child behavior and parent–child interactions.

Keywords

discipline, empathy, externalizing behavior, sensitivity, sibling gender configuration

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Introduction

Sibling gender configuration is a structural family characteristic that refers to the combination of gender and ordinal position of siblings in a family. The unique effects of child gender and birth order on child behavior and parenting have been investigated widely (e.g., Lawson & Mace, 2008; Loeber, Capaldi, & Costello, 2013), but research on their joint influence is scarce. There is some evidence that sibling gender configuration plays a role in child social-emotional development and parent-child interactions (e.g., Rust, Golombok, Hines, Johnston, & Golding, 2000; Shanahan, McHale, Crouter, & Osgood, 2007). For example, older girls and boys are found to have unique effects on their younger siblings' gender-stereotyped behaviors (Rust et al., 2000), and firstborn girls appear to have a warmer relationship with their mothers than later born sons (Shanahan et al., 2007). However, most studies on sibling gender configuration are relatively old and tend to focus on only one child or a single mother-child dyad per family without taking into account sibling gender combinations (e.g., Cohen & Beckwith, 1977; Rothbart, 1971; Rust et al., 2000). In the current study, we systematically recruited two-parent families with two girls, two boys, or both a girl and a boy to test the hypothesis that children's early social-emotional behavior and parent-child interactions are influenced by sibling gender configuration.

Sibling Gender Configuration and Family Processes

According to family system theories, family structure plays an important role in young children's social-emotional development and in the relationship between parents and their children (McHale & Lindahl, 2011). Two widely studied structural family characteristics are child gender and birth order (e.g., Lawson & Mace, 2008; Loeber et al., 2013). To date, research on their joint influence reflected in the construct of sibling gender configuration is scarce. However, there is some evidence that gender configuration has a unique impact on family interactions above and beyond the effects of child gender and ordinal position (e.g., Kier & Lewis, 1998; Rust et al., 2000; Shanahan et al., 2007). The role of sibling gender configuration in family processes can be explained by parent-driven and child-driven effects.

Regarding parent-driven effects, sibling gender configuration can influence parents' gender-typed expectations of their children's characteristics, which can influence everyday parent-child interactions (Conley, 2000). For example, the normative climate hypothesis suggests that in families with more boys than girls, parents tend to focus more on masculine characteristics such as dominance striving and achievement orientation in their parenting behavior toward

all of their children, regardless of the children's individual gender (Powell & Steelman, 1990). In a related vein, it has been suggested that parents' target-based expectations regarding their children are influenced by the experiences parents have with their other children, who are of different age and gender (Brody, 2004; Whiteman & Buchanan, 2002). Such expectations can in turn affect the way parents treat each individual child (Brody, Kim, Murry, & Brown, 2003). Several theoretical frameworks suggest that sibling gender configuration influences parents' differential treatment of their children (Conley, 2000). For instance, according to the resource dilution hypothesis, parents, especially fathers, invest more time, money, and care in their sons than in their daughters (Raily & Bianchi, 2006), potentially leading to more differential parenting practices in families with mixed-gender siblings. For children, differential parenting based on the sibling gender configuration can serve as a source of social comparison, which may influence both future parent-child and sibling interactions as well as individual child behavior (Dunn, 1992). In line with this model, it has been argued that siblings, and especially later born siblings, show very diverse behavioral patterns to differentiate themselves from each other in the context of (unconscious) sibling rivalry for parental attention and to fill a niche of their own in the family (Sulloway, 2010).

Regarding child-driven effects, children's genetic predisposition toward specific behaviors may elicit specific parenting behaviors (e.g., Klahr & Burt, 2013). Given that girls and boys show different behavioral patterns from a young age (e.g., Loeber et al., 2013; Zahn-Waxler, Robinson, & Emde, 1992), they may also elicit different reactions from their parents. Although to our knowledge there are no studies investigating the role of sibling gender configuration in the relation between child characteristics and parenting, it is conceivable that the gender combination of siblings can either amplify or moderate parents' gender-differentiated reactions to their daughters and sons. That is, parents of mixed-gender siblings may show more gender-differentiated parenting practices than parents of same-gender siblings because they have to cope with gender-based differences in child behavior. Alternatively, parents of same-gender siblings, who are likely to encounter predominantly child behaviors that are stereotypically masculine or feminine may fully adapt their parenting practices in line with their children's gendered behaviors. Consistent with this line of thought, parents of mixed-gender siblings may be more likely to show moderate levels of gender-differentiated parenting to meet the needs of their daughters as well as their sons.

Sibling Gender Configuration and Child Behavior. Concerning the relation between sibling gender configuration and child behavior, firstborn boys have been found to show more behavior problems (Lahey, Hammer, Crumrine, &

Forehand, 1980) and later born girls are found to be more popular among peers (Miller & Maruyama, 1976) than the respective other gender \times birth-order combinations. However, in a more recent study, levels of relational aggression decreased over time in firstborn boys, whereas they increased in later born girls (Stauffacher & DeHart, 2006). In addition, both preschool girls and boys with (especially older) brothers have been found to be more masculine and less feminine in their interests, activities, and characteristics than children with sisters (Rust et al., 2000). Quality of the sibling relationship may also vary for different sibling gender combinations (McGuire, Manke, Eftekhari, & Dunn, 2000), which in turn can influence child behavior (Scholte, Engels, De Kemp, Harakeh, & Overbeek, 2007). For example, there is evidence that girls are generally more positive and nurturing toward their younger siblings than boys (Dunn, Deater-Deckard, Pickering, & Golding, 1999), but especially when the younger sibling is a girl (Kier & Lewis, 1998). This latter finding suggests that the gender *combination* of the siblings also plays a role in sibling relationships.

Sibling Gender Configuration and Parenting. With regard to sibling gender configuration and parenting, mothers have been found to be more intrusive and controlling toward firstborn daughters than toward later born daughters and then toward both firstborn and later born sons (Cohen & Beckwith, 1977; Rothbart, 1971). However, in a more recent study firstborn daughters reported warmer relationships with their mother than did second-born sons (Shanahan et al., 2007). In another study, boy–boy dyads were found to receive lower levels of maternal warmth compared with other sibling gender constellations (McHale, Updegraff, Jackson-Newsom, Tucker, & Crouter, 2000). These findings suggest that boys receive less warmth from their mother particularly in comparison with firstborn girls. Other studies on parenting that have examined the impact of sibling gender configuration focused on fathers' and mothers' differential treatment of siblings during early and middle childhood and early adolescence (e.g., McHale et al., 2000; Volling, 1997; Volling & Elins, 1998). These studies show mixed results. For example, in one study, same-gender adolescent dyads reported more differential treatment than mixed-gender dyads (McHale et al., 2000), whereas in a more recent study, higher levels of differential treatment were found in mixed-gender child combinations (Poonam & Punia, 2012). Although no effects of sibling gender configuration have been found for parents of toddlers and preschoolers (Volling, 1997; Volling & Elins, 1998), it must be noted that studies on differential parenting during early childhood often rely on parent-reports, whereas studies focusing on middle childhood and adolescence more often include observations or child-reports. These latter two

measures may be more appropriate when studying differential parenting practices as parent-reports can be prone to social desirability.

The Current Study: A Full-Family Approach

To date, most studies that examined the unique effects of child gender, birth order, or the combination of both characteristics included a single child or parent-child dyad (mostly mother-child) within families, which offers us only a limited view on family structure in relation with family processes. The lack of research that includes fathers and all parent-child dyads is compounded by the fact that most studies focusing on the combined effects of child gender and birth order on parenting during early childhood do not take gender of the other sibling into account. Consequently, the question whether the gender *combination* of siblings in a family has a unique influence on parenting while accounting for birth order remains largely unanswered. Furthermore, most studies focusing on the relation between sibling gender configuration and child and parenting behavior are relatively old, and only few studies used observation methods to examine this topic (e.g., Cohen & Beckwith, 1977; Rothbart, 1971; Volling & Elins, 1998).

In the current study, we investigated differences between families with the four different sibling gender configurations (girl-girl, boy-boy, girl-boy, and boy-girl) in terms of children's early social-emotional behavior as well as parent-child interactions. Regarding child behavior, observed noncompliance and oppositional behavior in response to parenting and parent-reported aggression were examined in both siblings, and empathic concern (parent-report) in the older sibling. Regarding parenting, we observed sensitivity and discipline strategies of fathers and mothers in response to child behavior. We hypothesized that both child behavior and parent-child interactions vary by specific sibling gender configurations. Due to the inconsistent findings on this topic and the lack of research studying gender of both siblings, we decided to examine differences in family processes based on sibling gender configuration in an explorative manner.

Method

Sample

This study is part of the longitudinal study *Boys will be boys?*, which examines the influence of gender-differentiated socialization on the social-emotional development of girls and boys in the first 4 years of life. This article reports on data from the first wave.

Families with two children in the western region of the Netherlands were eligible for participation. Contact details of the eligible families were obtained from municipality records. Families were included if the youngest child was around 12 months of age and the oldest child was around 2 years older at the time of recruitment. Between April 2010 and May 2011, eligible families were invited by mail to participate in the study, asking both father and mother to participate on a home visit each per year for 4 years including videotaping, computer testing, and filling in questionnaires. They received a letter, a brochure with details of the study, and a reply card. The families who replied positively were screened on the following exclusion criteria: single parenthood, severe physical or intellectual impairments of parent or child, having been born outside the Netherlands, and/or not speaking the Dutch language. Of the 1,249 eligible families we approached, 31% ($n = 390$) participated in the study. The participating families did not differ from the nonparticipating families in age of fathers ($p = .13$) or mothers ($p = .83$), the educational level of fathers ($p = .10$) or mothers ($p = .17$), and the degree of urbanization of the place of residence ($p = .77$). For the current article, families in which neither parent had completed the pertinent questionnaires were excluded, as well as families of which no data were available from the observation tasks during the father or the mother visit (total $n = 21$). When a questionnaire was completed by one of the parents, these scores were used as the best estimate of the missing parent's scores. This resulted in a final sample of 369 families. The participating families did not differ from the excluded families regarding age of fathers or mothers, degree of urbanization of residence, and paternal educational level (all $ps > .75$). However, mothers in the participating families had a higher educational level than mothers in the excluded families, $t(388) = -3.92, p < .01$.

In order to study parent-child interactions rather than observing parenting regardless of child behavior, parental discipline strategies were measured in response to child noncompliance (see parenting measures). Families in which one or both of the siblings did *not* show noncompliant behavior during the observed tasks were excluded from the analyses of parenting behavior, which resulted in a subsample of 232 families. The families in this sample did not differ from the excluded families on any of the background variables (all $ps > .17$). However, the oldest siblings in this sample were rated as more aggressive by their parents ($M = 4.40, SD = 3.03$) than children in the excluded families ($M = 3.65, SD = 2.80$), $t(372) = -2.65, p < .01$. Children in the final sample and children of the excluded families did not differ on parent-reported empathic concern (see child measures).

At the time of the first visit, the younger siblings were exactly 12 months old ($SD = 0.02$) and the older siblings were between 2.5 and 3.6 years old

($M = 3.0$, $SD = 0.3$). Fathers were aged between 26 and 63 years ($M = 36.8$, $SD = 5.0$) and mothers were between 25 and 46 years of age ($M = 34.0$, $SD = 3.9$). Most of the participating parents were married or had a cohabitation agreement or registered partnership (93%) and most of the parents had a high educational level (mothers: 81%, fathers: 77%). The sibling gender configurations were as follows: 86 girl–girl (23%), 91 girl–boy (25%), 100 boy–boy (27%), and 92 boy–girl (25%).

Procedure

Each family was visited twice a year within a period of approximately 2 weeks, once with the father and the two children and once with the mother and the two children. The order of father and mother visits was counterbalanced. Families received a yearly gift of 30 Euros and small presents for the children after each visit. Prior to the home visits, both parents were asked to individually complete a set of questionnaires. During the home visits, parent–child interactions and sibling interactions were filmed, and children and parents completed computer tasks. All visits were conducted by pairs of trained graduate and undergraduate students. Informed consent was obtained from all participating families. Ethical approval for this research was provided by the Research Ethics Committee of the Institute of Education and Child Studies of Leiden University.

Measures

Child Characteristics

Aggression. The Child Behavior Checklist (CBCL) for preschoolers (ages 1½–5; Achenbach & Rescorla, 2000) was used to measure aggressive behavior of the two siblings. Both fathers and mothers indicated whether they had observed any of the described 14 aggressive behaviors in the past 2 months on a 3-point scale (0 = *not true*, 1 = *somewhat or sometimes true*, 2 = *very true or often true*). The internal consistencies of the aggression scale for the older sibling were .84 (Cronbach's alpha) for fathers and mothers. The internal consistencies for the younger sibling were .75 (Cronbach's alpha) for fathers and .72 (Cronbach's alpha) for mothers. The CBCL scores of fathers and mothers on aggression were significantly correlated for the older sibling ($r = .59$, $p < .01$), as well as for the younger sibling ($r = .41$, $p < .01$). Furthermore, mean scores on the CBCL of fathers and mothers were not significantly different for each of the siblings ($ps > .34$). To obtain a composite measure for aggressive behavior, father and mother scores were averaged for each of the two children separately.

Child noncompliance and oppositional behavior. Both children's noncompliance and oppositional behaviors toward their parents were measured with a *don't touch task*. During this task, the parent received a bag with attractive toys and was given the instruction to not let the children play with the toys for a period of 2 minutes. Subsequently, both siblings were only allowed to play with the least attractive toy (a stuffed animal) for another 2 minutes, after which the task was finished. Child noncompliance was measured by the number of events during which the child reached for or touched the prohibited toys. During the 10 seconds following the start of an event, parental discipline strategies were coded and no new events were recorded. The coding of events was resumed after these 10 seconds. In addition to noncompliance, we coded the absence (scored 0) or presence (scored 1) of verbal protest throughout the task as an indicator of child oppositional behavior.

A group of nine coders rated the videotapes on child noncompliance and oppositional behavior. Although the parents were observed with both siblings simultaneously, each sibling within a family was coded by a different coder during the father as well as the mother visit to ensure independent ratings. Intraclass correlations (absolute agreement) for noncompliance were all higher than .92, and the levels of agreement (Cohen's kappa) for oppositional behavior were above .74 ($n = 60$). To prevent coder drift, regular meetings were organized. For the current study, both siblings' responses to the task during the first visit were taken as a measure of child noncompliance and oppositional behavior to avoid a learning effect during the second visit.

Empathy. Empathy of the older sibling was measured with the subscale Empathic, Prosocial Response to Another's Distress from the My Child Questionnaire (Kochanska, 2002). Both fathers and mothers filled in whether they considered any of the 13 given empathic responses (e.g., "Promptly notices others' feelings") to be typical of their oldest child on a 5-point scale (0 = *not true*, 1 = *somewhat not true*, 2 = *not true/not incorrect*, 3 = *somewhat true*, 4 = *true*). The internal consistencies on this scale were .62 (Cronbach's alpha) for fathers and .66 (Cronbach's alpha) for mothers. Because fathers' and mothers' scores were significantly correlated ($r = .38, p < .01$), but their mean scores differed significantly ($p < .01$), combined standardized mean scores were computed.

Parent–Child Interactions

Sensitivity. The fourth edition of the Emotional Availability Scales (EAS; Birneng, 2008) was used to measure fathers' and mothers' sensitivity and non-intrusiveness toward the oldest and younger sibling during free play. In

separate sessions, each dyad (i.e., father–oldest, mother–oldest, father–youngest, mother–youngest) received a bag with toys and was invited to play for 8 minutes. Both sensitivity and nonintrusiveness are divided into seven subscales; the first two subscales are coded on a 7-point Likert-type scale and the other subscales are coded using a 3-point Likert-type scale. A team of graduate and undergraduate students were trained by the second author who completed the online EAS training of Zeynep Biringen and who is an experienced coder of parent–child interactions. During the training, three types of alterations were made to prevent persistent interpretation problems and to improve intercoder agreement. These alterations consist of removing subjective criteria, adjustment of the criteria for different scores on certain subscales to make the scales more linear, and improvement of the independence of the separate dimensions by removing overlapping criteria. In addition, one subscale was removed from the nonintrusiveness scale because it referred to child behavior rather than parenting.

Seven coders rated the videotapes on the EAS dimensions. All dyads within the same family (i.e., father–oldest, mother–oldest, father–youngest, mother–youngest) were coded by different coders to guarantee independency among ratings. Furthermore, the EAS dimensions were rated by coders who had not coded child noncompliance and oppositional behavior or parental discipline (see below). Intraclass correlations (absolute agreement) were all higher than .73 for sensitivity and higher than .76 for nonintrusiveness ($n = 60$). During the coding process, the first 100 videotapes were coded twice by separate coders and regular meetings were organized to prevent coder drift.

The scores on sensitivity and nonintrusiveness were significantly correlated for fathers (older sibling: $r = .51, p < .01$, younger sibling: $r = .34, p < .01$), and for mothers (older sibling: $r = .56, p < .01$, younger sibling: $r = .33, p < .01$), but mean scores on the two scales differed significantly for both parents ($ps < .01$). As nonintrusiveness can be considered as part of parental sensitivity to child signals in general, combined standardized mean scores were calculated for fathers and mothers separately regarding each sibling to create a composite measure for paternal and maternal sensitivity.

Parental Discipline. Fathers' and mothers' discipline strategies in reaction to child behavior were measured during the *don't touch task* (see child noncompliance). Parental discipline was measured by coding the parent's responses to every event of noncompliant behavior within 10 seconds after the child had reached for or touched the toys. Two types of active discipline were coded: verbal response (e.g., "no," "you are not allowed to touch them yet") and physical interference (e.g., holding the child or moving the toys out of reach).

Parental discipline was rated by a group of 10 coders. All dyads within the same family were rated by different coders. Furthermore, parental discipline of fathers and mothers were rated by coders who had not coded child non-compliance and oppositional behavior of either one of the siblings in the presence of that particular parent (see child measures). Intraclass correlations (absolute agreement) were all higher than .90 for command and higher than .83 for physical interference. Just like for parental sensitivity, regular meetings were planned to prevent coder drift. Because the amount of parental discipline during the task depended on the number of events during which children showed noncompliant behavior, proportion scores were calculated.

Data Analysis

All measures were inspected for possible outliers that were defined as values more than 3.29 *SD* above or below the mean (Tabachnick & Fidell, 2012). The outlying values were winsorized, meaning that they were given a score that was no more extreme than the most extreme value that fell within the accepted range of a normal distribution. Because aggression and noncompliance of both siblings were positively skewed, logarithmic (\log_{10}) transformations were used for the analyses (Tabachnick & Fidell, 2012).

To assess the differences in child behavior and parent-child interaction patterns between families with two girls, two boys, or a combination of both, multivariate analyses of variance were conducted. Separate models were tested for sibling behavior and for parent-child interactions. Furthermore, to visualize and further elucidate the association of sibling gender configuration with child behavior and parent-child interaction, we created separate biplots for the two models based on nonlinear principal component analysis (CATPCA).

Results

Preliminary Analyses

Correlations between the dependent (child and parent-child interaction) variables are shown in Table 1. All (child and parenting) variables were positively correlated for the older and the younger sibling with the exception of child oppositional behavior. Fathers' and mothers' sensitivity were positively correlated for both the older and the younger sibling, and the same was true for fathers' and mothers' physical interference with the older sibling. Finally, lower levels of noncompliance in the younger sibling were related to higher parental discipline.

Table 1. Correlations for Child Characteristics and Parenting (n = 369).

	1	2	3	4	5	6	7	8	9	10
1. Aggression	.33**	.16**	.13*	-.06	-.11*	.07	.04	-.08	.14*	.10
2. Noncompliance	.02	.49**	.20**	-.04	.03	-.05	-.03	-.26**	.09	.00
3. Oppositional behavior	-.08	-.12*	-.09	-.12*	.04	-.02	.01	-.03	.20**	.18**
4. Empathy older sibling	—	—	—	—	.06	.02	.02	.05	.03	.06
5. Sensitivity: mother	.01	.02	.12*	-.03	.30**	.18**	.06	-.09	-.08	-.03
6. Sensitivity: father	.07	.08	.02	.09	.26**	.32**	.00	-.06	-.10	-.12*
7. Discipline: verbal response mother	.07	-.16**	-.07	.04	-.02	.05	.21**	.03	.39**	.02
8. Discipline: verbal response father	-.07	-.23**	.11*	-.05	.05	.01	.05	.28**	.02	.40**
9. Discipline: physical interference mother	-.01	-.26**	.17**	.05	.01	.03	.44**	.01	.26**	.20**
10. Discipline: physical interference father	-.09	-.33**	.17**	.02	-.08	-.04	.04	.47**	.09	.22**

Note. Correlations for the older siblings are presented above the diagonal (bold), correlations for younger siblings below the diagonal, and correlations between siblings on the diagonal. Empathy was only measured for the older sibling.
*p < .05. **p < .01.

Sibling Gender Configuration and Child Behavior

In Table 2, both the older and younger siblings' scores on aggression, non-compliance, and oppositional behavior, and the older siblings' scores on empathy are presented for the various sibling gender configurations. Sibling gender configuration had a significant effect on child behavior, Pillai's trace $V = 0.11$, $F(21, 1083) = 2.00$, $p < .01$. Regarding the older sibling separate univariate analyses of variance on the dependent variables revealed significant effects on aggression, $F(3, 365) = 3.15$, $p < .05$, $\eta_p^2 = .03$, and oppositional behavior, $F(3, 365) = 4.11$, $p < .01$, $\eta_p^2 = .03$. Post hoc Bonferroni tests showed that boys with a younger brother were rated as more aggressive by their parents than girls with a younger sister ($p < .05$). Furthermore, boys with a younger brother more often showed oppositional behavior toward their parents during the *don't touch task* than girls with a younger brother ($p < .01$). Regarding the younger sibling, we found a significant effect of sibling gender configuration on noncompliant behavior during the *don't touch task*, $F(3, 365) = 4.41$, $p < .01$, $\eta_p^2 = .04$. The post hoc Bonferroni test showed that boys with an older brother displayed more noncompliance than boys with an older sister ($p < .01$).

The biplot in Figure 1 shows that the group mean of families with two boys loaded positively on Dimension 1, which is characterized by relatively high levels of aggression and oppositional behavior of the older sibling and high noncompliance of both siblings, and by moderately lower levels of empathy of the older sibling and oppositional behavior of the younger sibling. The group mean of families with an older girl and a younger boy had a negative loading on Dimension 1 and a positive loading on Dimension 2. Dimension 2 is characterized by high aggression and moderately low oppositional behavior of both siblings. The group means of families with two girls and families with an older boy and a younger girl had near-zero loadings on the two dimensions.

Sibling Gender Configuration and Parent–Child Interactions

In Table 3, both fathers' and mothers' scores on sensitivity and disciplinary strategies in response to child noncompliant behavior are shown for the four groups of families with different sibling gender combinations. Sibling gender configuration had a significant effect on parenting behavior, Pillai's trace $V = 0.22$, $F(36, 657) = 1.44$, $p < .05$, and separate univariate analyses of variance on the dependent variables revealed a main effect on fathers' sensitivity toward the younger sibling, $F(3, 228) = 3.45$, $p < .05$, $\eta_p^2 = .04$. The post hoc Bonferroni test showed that fathers were less sensitive toward their youngest child when they had two boys compared with two girls ($p < .05$).

Table 2. Means and Standard Deviations on Child Behaviors for Different Sibling Gender Configurations ($n = 369$).

	Gender oldest sibling–gender younger sibling					M (SD)	Range	Pillai's F	η_p^2
	Girl–girl ($n = 86$)	Boy–boy ($n = 100$)	Girl–boy ($n = 91$)	Boy–girl ($n = 92$)	Total ($n = 369$)				
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)				
<i>Aggression</i>									
Older sibling	3.60 (2.78) ^a	4.78 (3.21) ^b	3.71 (2.63)	4.31 (3.10)	4.12 (2.97)	0.00–16.50	3.15*	.03*	
Younger sibling	2.67 (1.99)	2.90 (2.17)	2.99 (1.92)	2.72 (2.38)	2.82 (2.12)	0.00–14.00	1.02	.01	
<i>Noncompliance</i>									
Older sibling	6.42 (4.24)	8.00 (5.77)	5.75 (4.62)	8.33 (6.34)	7.16 (5.43)	0.00–24.00	2.07	.02	
Younger sibling	5.35 (5.48)	6.95 (5.82) ^a	4.41 (4.79) ^b	6.21 (5.58)	5.76 (5.50)	0.00–23.00	4.41***	.04**	
<i>Oppositional behavior</i>									
Older sibling	0.10 (0.31)	0.19 (0.39) ^a	0.04 (0.21) ^b	0.08 (0.27)	0.11 (0.31)	0.00–1.00	4.11***	.03**	
Younger sibling	0.65 (0.48)	0.62 (0.49)	0.71 (0.45)	0.74 (0.44)	0.68 (0.47)	0.00–1.00	1.32	.01	
<i>Empathy</i>									
Older sibling	32.74 (5.31)	31.02 (5.86)	32.33 (6.37)	31.60 (5.90)	31.89 (5.89)	14.00–47.50	1.53	.01	

Note. To facilitate interpretation, the nontransformed scores are presented. Different superscripts indicate significant differences between columns.
* $p < .05$. ** $p < .01$.

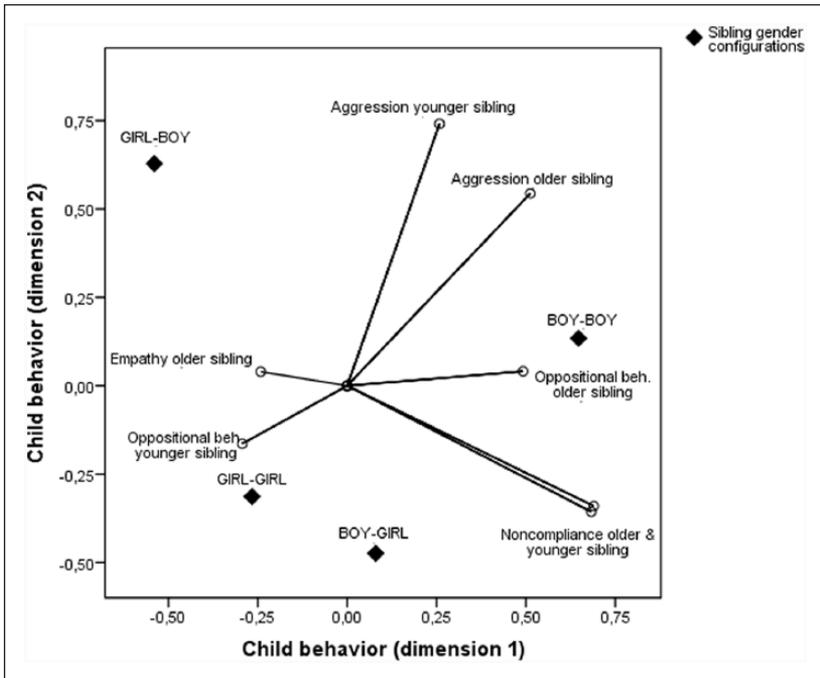


Figure 1. Biplot of child behavior with group means of the four sibling gender configurations.

Note. The first part of the labels for the different sibling gender configurations refers to the gender of the oldest sibling.

The biplot in Figure 2 shows that the group mean of families with two girls loaded negatively on Dimension 1, which can be characterized by high paternal verbal and physical discipline strategies and low sensitivity of both parents. The group mean of families with two boys loaded negatively on both Dimension 1 and Dimension 2. Dimension 2 is characterized by high maternal verbal and physical discipline strategies and by high sensitivity of both fathers and mothers. The group mean of families with an older girl and a younger boy loaded positively on both dimensions, whereas the group mean of families with an older boy and a younger girl had near-zero loadings on the two dimension.

Discussion

Examining the joint effect of sibling gender and birth order on family processes, we found that families with two boys differed from families with two girls and

Table 3. Means and Standard Deviations on Parenting Toward the Oldest and the Younger Sibling ($n = 232$).

Dyad	Gender oldest sibling–gender younger sibling					M (SD)	Range	Pillai's F	η_p^2
	Girl–girl ($n = 53$)	Boy–boy ($n = 65$)	Girl–boy ($n = 60$)	Boy–girl ($n = 54$)	Total ($n = 232$)				
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)				
<i>Sensitivity</i>									
Mother–oldest	22.63 (2.92)	22.47 (2.59)	22.38 (3.03)	22.75 (2.31)	22.55 (2.72)	13.50–27.50	0.24	.00	
Mother–youngest	21.60 (2.70)	21.38 (2.73)	21.85 (2.27)	22.08 (2.47)	21.72 (2.55)	14.00–27.50	0.82	.01	
Father–oldest	21.82 (2.78)	21.32 (3.04)	22.50 (2.85)	21.85 (2.58)	21.86 (2.84)	13.50–27.50	1.81	.02	
Father–youngest	21.72 (2.61) ^a	20.15 (3.06) ^b	20.29 (2.82)	21.00 (3.22)	20.74 (2.99)	12.50–27.50	3.45*	.04*	
<i>Discipline: verbal response</i>									
Mother–oldest	0.73 (0.27)	0.72 (0.27)	0.74 (0.26)	0.71 (0.27)	0.73 (0.27)	0.00–1.00	0.17	.00	
Mother–youngest	0.56 (0.33)	0.48 (0.34)	0.61 (0.36)	0.48 (0.35)	0.53 (0.35)	0.00–1.00	2.17	.03	
Father–oldest	0.68 (0.30)	0.67 (0.31)	0.74 (0.27)	0.67 (0.31)	0.69 (0.30)	0.00–1.00	0.72	.01	
Father–youngest	0.39 (0.38)	0.34 (0.30)	0.48 (0.35)	0.41 (0.36)	0.40 (0.35)	0.00–1.00	1.72	.02	
<i>Discipline: physical interference</i>									
Mother–oldest	0.39 (0.34)	0.51 (0.30)	0.41 (0.33)	0.50 (0.31)	0.45 (0.32)	0.00–1.00	2.04	.03	
Mother–youngest	0.73 (0.31)	0.72 (0.33)	0.80 (0.31)	0.71 (0.30)	0.74 (0.32)	0.00–1.00	1.00	.01	
Father–oldest	0.34 (0.32)	0.49 (0.36)	0.47 (0.34)	0.41 (0.30)	0.43 (0.34)	0.00–1.00	2.28	.03	
Father–youngest	0.60 (0.39)	0.66 (0.38)	0.63 (0.37)	0.65 (0.36)	0.64 (0.37)	0.00–1.00	0.23	.00	

Note. Different superscripts indicate significant differences between columns.

* $p < .05$.

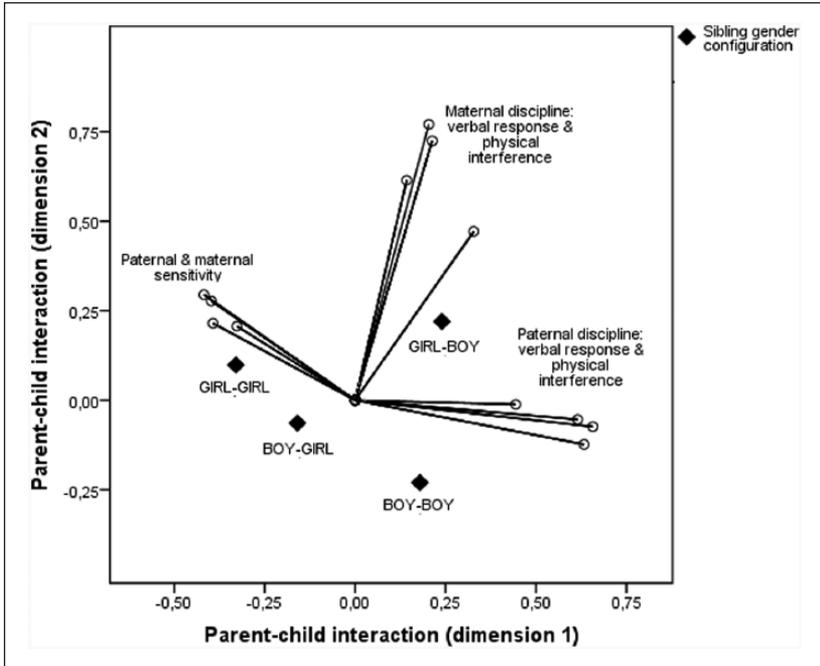


Figure 2. Biplot of parent–child interaction characteristics with group means of the four sibling gender configurations.

Note. The first part of the labels for the different sibling gender configurations refers to the gender of the oldest sibling.

from families with an older girl and a younger boy in terms of both siblings' externalizing behaviors. Boys with a younger brother were rated as more aggressive by their parents than girls with a younger sister and showed more oppositional behavior toward their parents than girls with a younger brother. Boys with an older brother showed more noncompliance toward their parents than boys with an older sister. Furthermore, fathers with two sons were found to be less sensitive toward their youngest child than fathers with two daughters.

Our finding that child behavior in response to parenting is different in families with two boys compared with families with an oldest girl supports family system theories, proposing that family structure plays an important role in daily family interaction patterns (e.g., McHale & Lindahl, 2011). Parent–child interaction patterns develop throughout a child's life and are likely to result from the interplay between parent- and child-driven effects (Granic, 2005; Wilson & Durbin, 2013). Regarding parent-driven effects, our

findings may be partly due to early parental gender role socialization based on gender-typed expectations parents may have of their daughters and sons (Conley, 2000). Fathers and mothers shape their children's gender-role development by modeling gender-differentiated behavior (e.g., Fulcher, Sutfin, & Patterson, 2008), providing their children with both direct and indirect messages about gender roles (e.g., Epstein & Ward, 2011), and stimulating different types of behaviors in girls and boys through gender-differentiated parenting (e.g., Chaplin, Casey, Sinha, & Mayes, 2010; Zahn-Waxler, Crick, Shirtcliff, & Woods, 2006). For instance, fathers engage in more rough-and-tumble and physical play with sons than with daughters (e.g., Flanders, Leo, Paquette, Pihl, & Séguin, 2009). This difference may lead to fewer opportunities for fathers to pick up emotional signals from infant boys (MacDonald, 1987), and therefore potentially less sensitive father-son interactions compared with other dyads, as found in our study.

There is also evidence that parents, particularly fathers, have a preference for their same-gender offspring (Lawson & Mace, 2009; Poonam & Punia, 2012), perhaps resulting in increased paternal involvement in childrearing in families with multiple sons compared with other families (Mammen, 2009). Consequently, children in boy-boy families are likely to be more frequently exposed to examples of masculine behavior, characterized by interpersonal dominance striving and active achievement orientation (McIntyre & Edwards, 2009). This pattern of child behavior is consistent with our findings of more oppositional and noncompliant behaviors in families with two boys compared with families with an oldest girl. Higher levels of child externalizing behaviors in families with two (or more) sons may in turn affect parents' expectations of younger siblings in the family (Whiteman & Buchanan, 2002), potentially resulting in less sensitive parent-child interactions.

Regarding child-driven effects, previous research has shown that boys have a higher genetic tendency for disruptive behavior than girls (e.g., Buckholtz et al., 2008), suggesting that boys may elicit different behavioral responses from their siblings and parents than girls. Given the unique character of the sibling relationship with its numerous opportunities to directly model and reinforce each other's behaviors, preferences, and interests (Jalongo & Dragich, 2008), problematic behavioral patterns in boys may become more pronounced in families with two sons. Externalizing behavior in both siblings has been found to lead to more conflict between siblings and to less sibling warmth and intimacy (Stormshak, Bellanti, & Bierman, 1996). In a related vein, higher levels of sibling conflict during middle childhood predicted more child problem behavior during early adolescence (Fosco, Stormshak, Dishion, & Winter, 2012). At the same time there is some evidence that sibling intimacy is positively related to risk-taking behavior (e.g.,

smoking, skipping school) in adolescent boy–boy pairs (Solmeyer, McHale, & Crouter, 2014), suggesting that brothers may encourage each other's externalizing behaviors. Furthermore, more child-problem behavior in families with two sons can lead to more family and parenting stress (e.g., Hastings, 2002; Neece, Green, & Baker, 2012), which may in turn make parents less able to provide sufficient attention and responsive care to their children (Cummings & Davies, 2002).

Although we found an effect of sibling gender configuration on various aspects of externalizing behavior of both siblings, no differences were found regarding noncompliant behavior and empathy of the older sibling or on aggression or oppositional behavior of the younger sibling. Furthermore, sibling gender configuration did not affect fathers' and mothers' sensitivity toward the oldest sibling or parental disciplinary strategies in response to the children's noncompliant behaviors. At the time of data collection, the younger siblings were 12 months old, and the effects of sibling gender configuration may be less prominent than at later ages. In addition, 12-month-olds are preverbal and their behaviors and parental interaction patterns are therefore likely to be qualitatively different from those found in older children, which may dampen the effects of sibling gender configuration in favor of age-related behavior patterns. Nevertheless, the current study shows that even in families with young children, some effects of sibling gender configuration can already be identified.

The current study has some limitations. First, most participating parents had a high educational level, and included mothers were more highly educated than mothers in the excluded families. In addition, preschoolers in families in which both children showed noncompliant behavior were rated as more aggressive than children in the excluded families, although it should be noted that on average these children still had relatively low scores on child aggression. In sum, the results may not be generalizable to families with different educational backgrounds and to preschoolers with different levels of problem behavior. Second, child aggression and empathy were measured using parental report. Questionnaires can be prone to social desirability and other response biases (Lagattuta, Sayfan, & Bamford, 2012), so future studies on sibling gender configuration in relation with family processes should include observations of child behavior and daily parent–child interaction.

In the present study, we found that families with two boys differed from two-child families with an oldest girl in terms of more externalizing behavior of both siblings, and from families with two girls in terms of lower levels of paternal sensitivity toward the younger child. This study extends previous research by including fathers, mothers, and both siblings, and by showing that differences in child behavior and parent–child interactions in relation to sibling gender configuration can be identified at a very young age.

Longitudinal research extending into later childhood will enable us to disentangle the dynamics through which sibling gender configuration affects family processes and will show whether differences between families become more salient when family interaction patterns have become more ingrained. In sum, our findings highlight the importance of sibling gender configuration for family processes in families with two children, and suggest that particularly families with two sons may show more problematic behavioral patterns compared with families in which the oldest child is a girl.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was supported by a European Research Council Starting Grant awarded to Judi Mesman (project # 240885). Marian J. Bakermans-Kranenburg was supported by the Netherlands Organization for Scientific Research (VICI Grant 453-09-003).

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