Improving Sibling Relationships Among Young Children: A Social Skills Training Model*

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A new approach to improving sibling relationships was evaluated in which social skills training was used to directly coach small groups of children (n = 21) in prosocial sibling behaviors. In comparison to a control condition (n = 21), social skills training was associated with mothers' or fathers' reports of: (1) increased warmth; (2) decreased rivalry; (3) stable levels of agonism and competition; (4) fewer problematic sibling behaviors; and (5) a reduced status/power differential between siblings. Social skills training may hold promise for setting young children's sibling relationships on a positive trajectory.

Disputes among siblings are the most common type of conflict that families face (Straus, Gelles, & Steinmetz, 1980) and may be quite aggressive and even violent (Felson & Russo, 1988; Roscoe, Goodwin, & Kennedy, 1987; Steinmetz, 1978; Straus et al., 1980; Weihe, 1991). Intractable conflictual relations among young siblings have been shown to be predictive of later difficulties, such as antisocial and disturbed behaviors in adolescence (Richman, Stevenson, & Graham, 1982) and adulthood (Patterson, 1982). These factors have led some investigators to refer to sibling relationships as potential "training-grounds" for violence (Steinmetz, 1978) and for establishing chronic coercive interactions with others (Patterson, 1982).

Although resources do exist for assisting families to respond to sibling conflict, they are limited in several ways (Ramsburg & Kramer, 1995). First, most resources are based primarily on clinical or practical experiences and lack both a theoretical foundation and empirical data to support their effectiveness. In addition, resources for younger children focus primarily on promoting their initial adjustment to the birth of a new sibling and generally do not focus on developing competencies for interacting positively and managing conflict once their sibling becomes a more active partner in the interaction. When attention is devoted to sibling interaction (e.g., Leitenberg, Burchard, Burchard, Fuller, & Lysaght, 1977; Levi, Buskila, & Gerzi, 1977; Olson & Roberts, 1987), recommendations are usually reactive (responding in situations where pronounced sibling conflict already exists) rather than proactive and preventive (working to encourage prosocial interaction among siblings before conflictual processes escalate). Finally, most programs are designed to change parents' behavior with the objective of indirectly changing child behavior. Indeed, there is a great deal of evidence to suggest that parents play a substantial role in shaping the quality of children's sibling relationships, particularly as they respond to sibling conflicts (Brody, Stoneman, McCoy, & Forehand, 1992; Ross, Filyer, Lollis, Perlman, & Martin, 1994; Vandell & Bailey, 1992) or work to encourage prosocial sibling behaviors (Kramer & Washo, 1990). For example, Tiedemann and Johnson (1992) found improved sibling behaviors when mothers were taught strategies for promoting child sharing skills. However, even stronger effects may be obtained if we directly support children's acquisition of new sibling interaction patterns. In this research, we evaluate a new approach to improving sibling relationships in which a social skills training model is used to directly coach young children in prosocial sibling behaviors.

The approach of developing interpersonal competencies as a way to improve sibling relationships is unique. However, it is supported by previous research on the early development of sibling relationships (Kramer & Gottman, 1992; Stocker & Dunn, 1990). Kramer and Gottman's (1992) longitudinal study demonstrated the importance of peer relationships and social competence in helping children to establish positive relationships with new siblings. Preschool-aged children and their families were visited in their home every 2 to 3 weeks from the last trimester of their mothers' pregnancy to 14 months following their new siblings' arrival. Observational and self-report data were collected to assess the children's functioning in three salient relationship systems (mother-child, sibling, and best friend peer). Results indicated that the overall quality of sibling relationships at 6 and 14 months post-birth could be reliably predicted from attributes of the children's relationship with their best friend, assessed before their new siblings were born. A follow-up evaluation further indicated that the overall quality of the best friend relationship continued to predict the sibling relationship measures over a 3- to 5-year period. Several interpersonal processes were identified that moderated these effects. These competencies were the ability to sustain play and conversation, to avoid a negative emotional climate, to engage in collaborative fantasy play, and to manage conflict. It was also notable that these friendship variables were significant in predicting the quality of sibling relationships even when controlling for the effects of age, gender, and the quality of parent-child and marital relationships. In a related study, Howe and Ross (1990) found that children's abilities to take the perspective of another child was correlated with friendly sibling relations. The present study extends these lines of research to evaluate whether the direct instruction of some of these social competencies within the peer context will be of value to young children for improving their relationships with siblings.

Enhancing Social Competence

Although there have been no previous models for directly instructing children on how to develop more prosocial interactions with siblings, an established literature exists on helping children improve their relationships with peers. This literature suggests that programs that enhance social competence are helpful for children of a wide age-range who have difficulty establishing successful interactions with peers and making friends (Ladd &

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Mize, 1983; McGinnis & Goldstein, 1990; Michelson, Sugai, Wood, & Kazdin, 1983; Oden & Asher, 1977). The present pilot program draws largely on these established techniques but targets social skills that are relevant for prosocial sibling interaction.

A major assumption underlying social skills training models is that the quality of children's interactions with peers may be enhanced by improving children's competencies in social knowledge, behavioral competence, and skill monitoring. According to Ladd and Mize (1983), successful programs focus on the potential deficits in children's knowledge about what the appropriate goals are for social interaction, which strategies they may use to achieve these goals, and how to apply these strategies in appropriate contexts. In addition, social skill training programs must help children develop abilities for translating knowledge into skilled performance. Finally, children must learn how to accurately monitor and interpret ongoing social interaction and to change their behaviors to fit the situation. Instruction, rehearsal, and feedback are the methods used to teach these skills in effective social skill training programs.

The current pilot prevention program uses techniques developed by Oden and Asher (1977), Mize and Ladd (1990), and McGinnis and Goldstein (1991) to train small groups of 4- to 6-year-old children in a set of social skills fundamental to prosocial sibling interactions. Six categories of social skills were taught over four sessions: (1) initiating play with a younger sibling; (2) ways to accept; and (3) appropriately decline an invitation to play; (4) perspective-taking; (5) dealing with angry feelings; and (6) conflict management. Instruction, modeling, rehearsal, performance feedback, and generalization training were the primary training techniques. Two adult facilitators discussed and modeled each of the targeted social skills. Each child then practiced the skills by role playing with another child and received feedback on their performance through coaching techniques. Generalization of training to the home environment was accomplished using a parent involvement component that allowed parents to help maintain their child's acquisition of sibling-relevant social skills in the home. In addition, a home session was conducted in which the children practiced the skills with their younger sibling while receiving immediate feedback from a coach. We hypothesized that children who received social skill training would engage in more positive sibling interactions after participating in the program in comparison to pre-training levels and in comparison to children in a control condition who received the type of information generally relayed to children in North American society when a new child enters a family.

Method

Participants

The program, "Fun with Brothers and Sisters," was advertised through newspaper ads and flyers distributed to local preschools and day care centers as a service to families wishing to help their children improve their sibling relationship. Of the 64 families who responded and met the eligibility criteria by having a 4- to 6-year-old child with a sibling under 30 months, 42 (66%) chose to participate. Families were randomly assigned to the experimental (n = 21) and control (n = 21) conditions.

Older siblings were 57.65 months of age on average (SD = 10.77) in the experimental group and 60.14 months (SD = 12.64) in the control group. Younger siblings were 18.95 (SD = 8.50) and 21.10 months (SD = 8.57) in the experimental and control groups, respectively. The age difference between siblings was 38.29 (SD = 10.77) and 39.05 (SD = 14.69) months in the experimental and control groups, respectively. In the experimental group, the 21 sibling pairs consisted of 4 older sister-younger sister dyads, 7 older sister-younger brother dyads, 2 older brother-younger sister dyads, and 8 older brother-younger brother dyads. In the control group, there were 9 older sister-younger sister dyads, 6 older sister-younger brother dyads, 3 older brother-younger sister dyads, and 3 older brother-younger brother dyads. Chi square analyses failed to reveal a significant difference in gender constellation between the two groups.

Participants were first-born children in 80% of the families. Fifteen (71%) and twelve (57%) of the experimental and control group families, respectively, were two-child families. Family size did not exceed four children.

All families were maritally intact. With the exception of one African-American family and one Asian family, participants were White. Parents were well-educated with approximately 16 years of education for mothers and 18 years of education for fathers. Median family income was $54,500 and $49,500 for the experimental and control groups, respectively. There were no significant differences between the groups on any of the demographic characteristics we evaluated. Families received no monetary compension for their participation in this project.

Procedures

Although children in the experimental and control conditions received different treatment methods (social skills training versus books and videotapes), all other procedures were exactly the same. All children were visited in their home to collect baseline measures of sibling interaction quality and parental reports of family relationships one week before the program began. Older siblings then met in groups of four or five with two adult facilitators for four weekly 40-minute sessions at the Family Relationships Laboratory at the University of Illinois. The laboratory resembles a family room with a large couch, chair, and assorted play materials. Each session was videotaped by camouflaged cameras that were positioned behind windows. The sessions were visible on monitors outside of the room so that parents could observe their children.

Facilitators were graduate students (one male and one female) in a master's degree program in marriage and family services. Facilitators had undergone over 8 weeks of training that included live observation of practice sessions in preparation for offering this program. Supervision was provided by the first author who is a licensed clinical psychologist.

Following the four campus sessions, children were visited in their homes to help the children apply what they had learned in the laboratory sessions to interactions with their actual sibling. Finally, post-test observations of sibling interaction were conducted in the children's homes during the final week of the study. Parental reports of sibling relationship quality were also collected at this time.

Week 1: Baseline measure of sibling interaction quality. Sibling interaction quality was assessed by videotaping the siblings as they interacted with one another in their homes for 30 minutes. Although parents were told that they could intervene if a child became distressed, parents were not present during the observations. Children were told that the researchers wanted to learn

more about how brothers and sisters play; however, they were not directed to play together. These videotaped interactions of children playing at home prior to participation in the program were later coded for the presence of prosocial skills. Parents also completed a set of questionnaires during this preliminary session (and again at post-test) that assessed their children's temperament and behavior problems, marital satisfaction, family cohesion and adaptability, and demographic characteristics.

Experimental Condition

Weeks 2-5: Treatment sessions on campus. During the four campus sessions, children in the experimental group were taught the rudiments of six relevant social skills: (1) how to initiate play appropriately; (2) how to accept and; (3) appropriately refuse invitations to play; (4) perspective-taking; (5) how to deal with angry feelings; and (6) manage conflict. With respect to the first three skills, children were generally encouraged to initiate play with their siblings. However, we expected that there would be occasions when siblings would not wish to interact and that learning skills for politely refusing a play invitation might circumvent many sibling conflicts. The perspective-taking skills that were taught emphasized the strategy of thinking about a situation from both the child's and the sibling's point of view as a way to open up communication about a potentially conflictual issue. For example, children were taught the simple phrase, "see it my way, see it your way," as a prompt for talking to their sibling about each other's preferences. Skills related to dealing with angry feelings emphasized verbalizing feelings of anger and frustration rather than enacting them. Conflict management strategies incorporated skills in communication, perspective taking, emotional control, and problem solving to help children respond to conflict situations constructively and without aggression. Finally, we identified with the children circumstances under which adults should be called to help resolve conflicts.

Following the model by McGinnis and Goldstein (1990), instruction, modeling, role playing, and positive feedback were used to teach these skills. For example, during the first session, the facilitators discussed appropriate ways of initiating play with a younger sibling, explaining why certain behaviors are more appropriate than others. Scripts were used to ensure consistency across groups. Next, the facilitators used toys and dolls to model the targeted behavior. Three large signs were used as visual cues to help the children adopt a general strategy for approaching problematic interpersonal situations that emphasized delaying impulsive responding, self-reflection, and communication. For each skill, the children were instructed to stop what they were doing (they were shown a "stop" sign), to think about what they wanted to do (the sign depicted a lightbulb over a person's head), and to talk to their younger sibling after they made a decision about how to approach the situation (the sign depicted two people talking). After the skill was modeled, the children participated in role plays in which each child took turns pretending to be an older or younger brother or sister. Different scenarios were used to demonstrate how the skill could be used with siblings who did or did not yet possess verbal abilities. The instructors provided the children with feedback on their performance, praising the children for both good attempts and successful behaviors. Children were then invited to engage in free play for 10 minutes before leaving. During this time, a facilitator actively praised the children for engaging in approximations of the social skills with peers. The second facilitator provided parents with a handout that summarized the purpose of the session and included specific suggestions for encouraging and rewarding the performance of the targeted skill with the child's sibling. Parents were given Weekly Progress Reports to complete during the coming week to track sibling behaviors in the home.

Week 6: Generalization training in the home. One week following the final treatment session on campus, generalization training was conducted in the families' homes. During the course of free play with the sibling, the facilitator prompted and praised the older child for using the social skills taught during the campus sessions. This generalization training session lasted 30 minutes and was videotaped.

Week 7: Post-test measures of sibling interaction quality. Post-test sibling interaction quality was assessed by videotaping the siblings as they played in their home, using procedures identical to those of the initial home visit. Parents also completed a set of post-test questionnaires that assessed current levels of sibling relationship quality and their final evaluation of the program.

Control Condition

Procedures for the control group were matched to those of the experimental group except that social skills training was not used during Weeks 2 through 5. Instead, group discussions, books, and videotapes were used to introduce the topics of initiating play with a sibling, accepting and refusing invitations to play, perspective taking, appropriately dealing with angry feelings, and managing conflict. That is, whereas the experimental group received direct instruction and opportunities to receive feedback as they practiced these behaviors, children in the control group only discussed these behaviors. For example, during the session on how to play appropriately with a younger sibling, children watched a videotape in which a young boy experienced the birth of a new sister and discovered different ways to play with her. After discussing the video, a facilitator read two books on this theme to the children. All books and videotapes were commercially available to families. Scripts were used to ensure consistency across groups.

Parents received handouts each week describing the major issues that were discussed in the session along with specific suggestions about how to continue talking with their children about these issues. However, parents were not given suggestions about how to teach their children how to perform these behaviors. Parents were also given Weekly Progress Reports to complete during the coming week to help monitor weekly changes in sibling relationship quality.

The procedures for the generalization training home visit (Week 6) were the same as those for the experimental group except that instead of reinforcing the use of social skills with the child's actual sibling, the facilitator reminded the target child of the topics and issues they had discussed during the campus sessions. For example, if a conflict arose, the older sibling was reminded about what a particular character from a book or videotape they watched felt or learned about conflict.

Measurements of Constructs

Parental Reports of Sibling Relationship Quality

Sibling Relationship Questionnaire. Furman and Buhrmester's (1985) Sibling Relationship Questionnaire (SRQ Parent

Version) was administered to mothers and fathers both one week before and one week after the laboratory training sessions. Parents rated their children's behaviors on 48 items using a 5-point Likert scale that indexed how typical each behavior is of their children's interactions (1 = *hardly at all*; 5 = *extremely much*). Parental responses on the SRQ are summarized with four scales: Warmth and Closeness, Rivalry, Conflict, and Relative Status/Power. Sample items for these scales include: (a) "How much do _____ and this child tell each other everything?" (Warmth and Closeness); (b) "Who usually gets treated better by mother, _____ or this sibling?" (Rivalry); (c) "How much do _____ and this sibling disagree and quarrel with each other?" (Conflict); and (d) "How much does _____ tell this sibling what to do?" (Relative Status/Power). As with the other self-report measures used the study, the report of one parent was randomly selected from each family to assess reliability. Internal consistency coefficients derived from the current sample were .94, .81, 79, and .88, for Warmth and Closeness, Rivalry, Conflict, and Relative Status/Power, respectively. Furman and Buhrmester (1985) reported a mean test-retest reliability coefficient over a 10-day period of .71. Test-reliability correlations for the current sample, obtained over a 12-week period, were satisfactory for Warmth and Closeness ($r = .58$, $p < .01$) and Conflict ($r = .45$, $p < .05$) but were nonsignificant for Rivalry and Relative Status/Power.

PEPC-SRQ. The Parental Expectations and Perceptions of Children's Sibling Relationship Questionnaire (PEPC-SRQ; Kramer & Baron, 1995) was used to assess parents' appraisals of the quality of their children's sibling relationship by considering the degree to which parents' current perceptions of their children's relationship deviate from their standards or expectations for their relationship. Using a 5-point Likert scale (1 = *never*; 5 = *always*), parents rated how often they believe each of 24 behaviors occurs in a realistic, high quality sibling relationship between children of the same ages and gender constellation as their children. For example, parents rated the frequency with which "physical aggression such as hitting or pushing" or "protectiveness such as looking out for the other's welfare" occurs in a "good" sibling relationship. This represents the parent's *standard* or goal for that behavior. In a separate portion of the questionnaire, parents rated how often the same behaviors occur in their own children's sibling relationship (1 = *never*; 5 = *always*). For example, parents are asked to indicate how frequently "physical aggression" or "protectiveness" occurs in their children's relationship. This score represents the *observed* behavior of their children. Discrepancy scores served as summary indices of sibling relationship quality and indicated the extent to which parental perceptions of their children's observed behavior deviated from their standards for that behavior. Discrepancy scores (computed as the standard minus observed behavior) were summarized using three scales: Warmth (13 items), Agonism (8 items), and Rivalry/Competition (3 items). Positive discrepancy scores indicate that the standard or expectation for a particular type of behavior is higher than the observed frequency of that behavior (an optimal outcome for Agonism and Rivalry/Competition). Negative discrepancy scores indicate that the observed behavior is occurring more frequently than the parent expects (an optimal outcome for Warmth). Standardized item alpha coefficients for the current sample were .92 for Warmth, .91 for Agonism, and .78 for Rivalry/Competition. Based on the current sample, test-retest reliability was .64 ($p < .001$), .45 ($p < .05$), and .51 ($p < .01$) for Warmth, Agonism, and Rivalry/Competition, respectively, over a 12-week pre-intervention period.

The two measures of sibling relationship quality were moderately correlated. The correlation between the SRQ and the PEPC-SRQ discrepancy score measures of Warmth was $-.55$, $p < .001$ at Time 1 and $-.30$, $p < .05$ at Time 2. Conflict as indexed by the SRQ also correlated with the PEPC-SRQ Agonism discrepancy scale, $r = -.47$ $p < .01$ at Time 1 and $-.72$, $p < .001$ at Time 2. Interestingly, scores on the Rivalry SRQ scale did not significantly correlate with those produced using PEPC-SRQ discrepancy scores for Rivalry/Competition at Time 1; however, the correlation at Time 2 was .38, $p < .01$. Upon closer examination, it appears that these scales are measuring very different constructs. Whereas the PEPC-SRQ items tap competitive sibling behaviors, the SRQ items address parents' perceptions of their differential treatment of children.

Weekly Progress Reports. This instrument was developed to determine if parents' perceptions of children's sibling interaction quality changed on a weekly basis throughout the four weeks of on-campus training. Parents rated the degree to which they observed 10 prosocial behaviors and 5 negative behaviors during the previous week on a 5-point Likert scale (1 = *never*, 5 = *almost always*). Examples of prosocial behaviors included "one child invited the other to play" and "older child accepted the younger's refusal to play without excessive anger" whereas negative behaviors included "children yelled at one another" and "children physically fought with one another." Internal consistency was .79 (alpha) for the prosocial scale and .84 for the negative scale. Progress was measured by calculating the number of behaviors that improved (i.e., ratings that changed in a positive direction from week 2 to 5), got worse (i.e., ratings that changed in a negative direction from week 2 to 5), and remained the same across the four weekly sessions.

Observational Assessment of Social Skill Use

An observational coding system was designed to measure the occurrence of social skill use exhibited by the children when interacting with their siblings at home. Every 30 seconds, coders indicated which of six targeted skills (initiating play, accepting an invitation to play appropriately, perspective-taking, refusing an invitation to play appropriately, dealing with angry feelings appropriately, and management of conflict) were initiated by the older sibling. Two independent coders, blind to treatment condition, coded 50% of the videotaped interactions. Inter-rater agreement was as follows: initiating play = 91%; accepting an invitation to play = 95%; perspective-taking = 97%; appropriately rejecting an invitation to play = 99%; appropriately expressing angry feelings = 99%; and, conflict management = 99%. However, as children were not observed to engage in the latter three social skills with sufficient frequency, subsequent analyses were conducted using only the first three social skills.

Potential Moderating Variables

In order to gather specific data on subjects that may be related to program effectiveness, a variety of child and family characteristics were assessed.

Child temperament. The EAS Temperament Survey for Children: Parental Ratings, developed by Buss and Plomin (1984), was used to assess three categories of temperament: Emotionality, Activity, and Sociability/Shyness. Mothers completed two copies of this questionnaire one week before participation in the program, once with regard to their older child and once for their younger child. Buss and Plomin report that the 20-

item instrument has a stable factor structure, as well as adequate internal consistency (M = .83) and test-retest reliability (correlations ranged from .58 to .80 over a one-week period). Internal consistency was .88, .83, and .80 (alpha) for Emotionality, Activity, and Sociability/Shyness, respectively, for the current sample.

Child behavior problems. The Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1974) was administered to mothers one week before participation in the program. Mothers indicated on a 3-point scale how often their children exhibited a set of potentially maladaptive behaviors. Three summary scores indicate the extent of internalizing, externalizing, and total behavior problems. Internal consistency for the current sample was .97, .84, and .98 (alpha) for internalizing, externalizing, and total behavior problems, respectively.

Marital adjustment. The Locke Wallace Marital Adjustment Test (Locke & Wallace, 1959) was administered separately to both mothers and fathers one week before participation in the program. Internal consistency was .76 (alpha) for the current sample.

Family cohesion and adaptability. The FACES III Questionnaire (Olson, Portner, & Lavee, 1985) was used to assess levels of family cohesion and adaptability. Family cohesion is defined as the degree of emotional bonding that is evident from family members' behaviors. Adaptability refers to a family's ability to change its power structure, role relationships, and rules in response to situational and developmental stress. This instrument was administered to mothers one week prior to participation in the program. Internal consistency was .80 and .62 (alpha) for cohesion and adaptability, respectively, for the current sample.

Family demographics. A questionnaire assessing a range of demographic characteristics (e.g., parents' occupation, age, education, hours worked outside of home, years of marriage, income), was administered to mothers one week before the program began.

Parent Evaluation Form

At the end of the study, parents of children in the experimental and control conditions completed a brief questionnaire about their opinions of the program. Parents were asked to indicate on a 5-point Likert scale the degree to which they agreed that (1) their child made positive comments about the program; (2) the program was helpful to their child; (3) they would consider enrolling their child in future sessions; and (4) they would recommend the program to other parents. Open-ended questions were also included to assess parents' opinions about the most helpful components of the program and to obtain their suggestions for improving the program.

Results

Preliminary Analyses

Preliminary analyses were conducted with data collected at pre-test to discover whether there were any statistically significant differences between the experimental and control groups before the start of the study that may have influenced program effectiveness. As shown in Tables 1 and 2, no statistically significant differences were found between the groups when comparing the temperamental and behavioral characteristics of the younger and older siblings or family cohesion and adaptability. Interestingly, although mother's reports of marital adjustment did not differ between the two groups, fathers in the experimental group reported lower marital adjustment than fathers in the control group, $F(1,37) = 5.04$, $p < .05$.

Table 1
Group Differences in Child Temperament and Child Behavior Problems (Maternal Reports)

	Temperament				
	Experimental		Control		
	M	*SD*	*M*	*SD*	*F*(1,41)
Older Sibling					
Shyness	2.65	(1.30)	2.45	(0.88)	0.33
Emotionality	2.76	(1.21)	2.85	(0.98)	0.06
Sociability	3.71	(0.78)	3.64	(0.73)	0.08
Activity	3.90	(0.92)	3.75	(0.85)	0.27
Younger Sibling	*M*	*SD*	*M*	*SD*	*F*(1,39)
Shyness	2.28	(1.08)	2.60	(0.99)	0.95
Emotionality	2.32	(1.06)	2.30	(0.72)	0.01
Sociability	3.74	(0.68)	3.69	(0.82)	0.05
Activity	4.18	(0.73)	4.16	(0.55)	0.01
	Child Behavior Problems				
	Experimental		Control		
	M	*SD*	*M*	*SD*	*F*(1,39)
Older Sibling					
Internalizing	10.75	(8.16)	10.40	(7.87)	0.02
Externalizing	9.80	(8.97)	10.35	(7.65)	0.04
Total Behavior Problems	27.35	(17.90)	24.95	(16.14)	0.20
Younger Sibling[a]	*M*	*SD*	*M*	*SD*	*F*(1,20)
Internalizing	5.90	(6.54)	4.09	(3.86)	0.61
Externalizing	22.60	(18.49)	15.36	(8.37)	1.38
Total Behavior Problems	36.40	(28.95)	25.46	(14.97)	1.22

[a]CBCL scores were not available on younger siblings under the age of 2 years.

The groups were also similar at pre-test with respect to children's sibling relationship quality with one exception (see Tables 3 and 4). Fathers in the experimental group rated their children as higher on Relative Status/Power than fathers of children in the control group, $F(1,41) = 6.03$, $p < .01$.

Preliminary analyses were also conducted to ascertain whether children's age and gender were associated with any of

Table 2
Group Differences in Marital Adjustment and Family Cohesion and Adaptability

	Marital Satisfaction				
	Experimental		Control		
Marital Adjustment	*M*	*SD*	*M*	*SD*	*F*(1,37)
Mothers	107.00	(30.34)	116.32	(17.49)	1.30
Fathers	96.11	(31.68)	115.11	(18.94)	5.04*
	Family Cohesion and Adaptability				
	Experimental		Control		
Mothers' Reports	*M*	*SD*	*M*	*SD*	*F*(1,37)
Adaptability	26.85	(7.21)	25.06	(4.64)	0.80
Cohesion	38.95	(10.15)	43.22	(3.83)	2.90
Fathers's Reports	*M*	*SD*	*M*	*SD*	*F*(1,37)
Adaptability	26.45	(5.97)	27.17	(4.37)	0.18
Cohesion	38.90	(7.63)	42.44	(3.22)	3.34

*$p < .05$.

Table 3
Mothers' and Fathers' Reports of Sibling Relationship Quality on the SRQ

	Pre-Test							
	Experimental Group				Control Group			
	Mothers		Fathers		Mothers		Fathers	
Sibling Relationship Characteristics	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Warmth	66.65	(15.02)	65.50	(8.98)	67.85	(13.84)	70.33	(8.52)
Status/Power[a]	9.25	(3.08)	10.00	(5.76)	7.73	(2.52)	6.13	(3.66)
Conflict	17.80	(7.68)	22.30	(6.63)	19.33	(9.35)	21.33	(6.77)
Rivalry[b]	19.05	(2.21)	18.65	(2.13)	18.73	(2.02)	19.52	(2.64)
	Post-Test							
	Experimental Group				Control Group			
	Mothers		Fathers		Mothers		Fathers	
Sibling Relationship Characteristics	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Warmth	68.26	(10.83)	56.00	(22.11)	62.38	(16.18)	61.68	(15.68)
Status/Power[a]	8.32	(3.16)	7.00	(3.96)	8.38	(3.38)	7.75	(5.80)
Conflict	20.58	(6.77)	17.58	(10.18)	21.75	(12.07)	20.38	(11.58)
Rivalry[b]	17.95	(2.12)	15.95	(6.88)	19.28	(1.85)	19.38	(2.20)

[a]Treatment Condition x Observation effect, $F(1,39) = 3.28$, $p < .06$, for fathers' reports.
[b]Treatment Condition x Observation effect, $F(1,39) = 5.93$, $p < .05$, for mothers' reports.

the pre-test indices of sibling relationship quality. Only 2 out of 20 correlations involving the age of the elder child was significant. Sibling dyads that included relatively older earlier-born children were described by their fathers as exhibiting higher levels of sibling Warmth than they expected to see in a good sibling relationship (PEPC-SRQ), $r = -.32$, $p < .05$, as well as greater Rivalry (SRQ), $r = .56$, $p < .001$. Five out of 20 associations between the age of the later-born child and sibling relationship quality were significant. Sibling dyads that included relatively older later-born children were rated by their mothers as having Warmer sibling relations ($r = -.32$ and .39, $p < .05$ on the PEPC-SRQ and SRQ measures, respectively), a lower Status/Power differential (SRQ), $r = -.30$, $p < .05$, as well as more Agonism (PEPC-SRQ), $r = -.53$, $p < .001$, and Conflict (SRQ), $r = .55$, $p < .001$. A larger age spacing between siblings was also linked with mothers' reports of less Warmth, $r = .33$, $p < .05$, and fathers' reports of less Agonism on the PEPC-SRQ, $r = .40$, $p < .01$. Taken together, these correlations suggest that as the age of the younger child increases, or when there is closer age spacing, siblings are more engaged with one another in both positive and negative ways.

Few variations in sibling relationship quality were found in accordance with children's gender or the gender constellation of the sibling dyad. One-way ANOVAs revealed that parents reported greater Rivalry for older male-younger female sibling dyads ($M = 20.77$) than for dyads consisting of an older female and younger male ($M = 18.45$), or two males ($M = 18.58$), $F(3,38) = 2.96$, $p < .05$.

For both groups of children, the initiation of play, acceptance of an invitation to play, and engagement in perspective-taking at pre-test were positively correlated with the age of the elder child, r's = .57, .54, and .46, $p < .01$, respectively. Perspective-taking at pre-test was also less likely to occur with younger laterborn children, $r = -.32$, $p < .05$. Interestingly, these associations were not significant at post-test. No other associations were

Table 4
Mothers' and Fathers' Reports of Sibling Relationship Quality on the PEPC-SRQ

	Pre-Test							
	Experimental Group				Control Group			
	Mothers		Fathers		Mothers		Fathers	
Discrepancy Scores	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Warmth[a]	2.23	(1.61)	1.79	(1.47)	1.61	(1.05)	1.50	(1.08)
Agonism[b]	–0.13	(1.83)	–0.43	(1.32)	–0.60	(1.62)	–0.33	(1.55)
Rivalry/Competition[c]	0.22	(1.69)	0.96	(1.12)	0.34	(1.22)	0.74	(1.42)
	Post-Test							
	Experimental Group				Control Group			
	Mothers		Fathers		Mothers		Fathers	
Discrepancy Scores	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Warmth[a]	1.34	(1.01)	1.34	(1.20)	2.08	(1.15)	1.22	(0.72)
Agonism[b]	–0.24	(1.61)	–0.40	(1.38)	–0.84	(1.10)	–0.80	(1.36)
Rivalry/Competition[c]	0.04	(1.78)	0.70	(1.40)	0.35	(1.73)	–0.46	(1.58)

[a]Treatment Condition x Observation effect, $F(1,39) = 8.10$, $p < .01$, for mothers' reports.
[b]Treatment Condition x Observation effect, $F(1,39) = 3.29$, $p < .07$, for fathers' reports.
[c]Treatment Condition x Observation effect, $F(1,39) = 5.57$, $p < .05$, for fathers' reports.

found between the demonstration of social skills and children's age and gender.

In summary, the significant correlations involving the age of the older and younger children prompted us to include these variables as covariates in subsequent analyses.

Hypothesis Testing

Three main hypotheses were tested. First, it was predicted that children in the social skills training (experimental) group would engage in more positive interactions with their sibling after participating in the program in comparison to their pre-training levels and in comparison to the control group, as measured through parental reports. Second, it was predicted that greater improvements in sibling relationship quality would be associated with more frequent enactment of the social skills taught in the program. Third, it was hypothesized that parents of children in the experimental group would appraise the program more positively than parents of children in the control group.

Parental reports of sibling relationship quality. A series of repeated measures MANCOVAs was used to determine if the experimental and control groups differed significantly in sibling relationship quality over time using parents' reports on the SRQ. A 2 (Treatment Condition) x 2 (Observation) repeated measures MANCOVA, with age of the older and younger siblings as covariates, was first conducted to assess change over time using mothers' SRQ scores for Warmth and Closeness, Relative Status/Power, Conflict, and Rivalry as dependent variables. A significant treatment condition by sibling relationship characteristic interaction effect was found, $F(3,37) = 2.82$, $p < .05$, indicating that scores varied for the two groups when different dimensions of the sibling relationship were under study. Follow-up univariate repeated measures ANCOVAs for each of the three sibling relationship characteristics revealed a significant treatment condition by observation interaction effect for maternal reports of Rivalry, $F(1,39) = 5.93$, $p < .05$. As shown in Table 3, perceived Rivalry decreased over time for the experimental subjects while increasing slightly for the control subjects. No other significant effects were found using maternal reports on the SRQ.

A parallel series of repeated measures MANCOVAs was then conducted using fathers' scores on the SRQ. Here, a significant interaction effect for observation and sibling relationship characteristic, $F(3,37) = 248.97$, $p < .001$, was found. Subsequent univariate ANCOVAs revealed a main effect for treatment condition for Relative Status/Power, $F(1,39) = 3.69$, $p < .05$. Fathers in the experimental group perceived a greater Relative Status/Power differential in their children's sibling interaction in comparison to the control group. In addition, a treatment condition by observation interaction effect for Relative Status/Power was marginally significant, $F(1,39) = 3.28$, $p < .06$. According to paternal reports, the experimental group tended to exhibit less of a Status/Power differential over time while the control group displayed a small increase. Whereas this finding could indicate that participation in social skills training is associated with a decrease in Relative Status/Power over time, this effect could also be due to unusually high scores on Relative Status/Power for the experimental group at pre-test.

Parental Reports on PEPC-SRQ. A parallel series of repeated measures MANCOVAs was conducted using maternal reports on the PEPC-SRQ. An interaction effect for treatment condition and observation was found, $F(2,39) = 4.50$, $p < .05$, indicating that mothers' reports varied according to treatment condition and observation. A main effect for sibling relationship characteristic, $F(2,39) = 17.12$, $p < .001$, was also found.

Follow-up univariate ANCOVAs indicated a significant treatment condition by observation interaction effect for maternal reports of Warmth, $F(1,39) = 8.10$, $p < .01$. As shown in Table 4, according to maternal experience, the experimental group improved in Warmth while the control group became worse between the pre- and post-test assessments.

A corresponding MANCOVA, using fathers' discrepancy scores for sibling Warmth, Agonism, and Rivalry/Competition, revealed a significant interaction effect for observation and sibling relationship characteristic, $F(2,38) = 21.24$, $p < .001$, as well as a main effect for sibling relationship characteristic, $F(2,38) = 18.52$, $p < .001$. Subsequent univariate ANCOVAs revealed a significant treatment condition by observation interaction effect for paternal discrepancy scores on Rivalry/Competition, $F(1,39) = 5.57$, $p < .05$. As shown in Table 4, fathers in the control condition reported a rather steep decrease in their discrepancy scores for Rivalry/Competition, representing perceptions of poorer sibling relationship quality over time, while fathers in the experimental condition reported rather consistent levels of Rivalry/Competition, with respect to their standards.

These analyses also revealed a treatment condition by observation interaction effect that reached marginal significance for fathers' discrepancy scores for Agonism, $F(1,39) = 3.29$, $p = .07$. Whereas fathers in the experimental group reported consistent discrepancy scores for Agonism over time, fathers in the control group reported increased Agonism, relative to their standards (see Table 4). Thus, according to paternal reports, the experimental conditions may have provided a stabilizing influence that prevented Agonism from increasing.

Sibling relationship quality assessed weekly by parents. The next set of analyses were conducted to determine if sibling relationship quality as measured through weekly parental reports differed in accordance with treatment condition from pre- to post-test. Three one-way ANCOVAs were then conducted to discover if there were any significant differences between the groups from pre- to post-test according to the number of behaviors that were rated as *improved, worse,* or *same*. The analyses revealed a significant main effect for treatment condition for the number of sibling behaviors that got worse over time, $F(3,32) = 4.53$, $p < .05$. An average of 2.4 items (16%) of the 15 total sibling behaviors were reported as becoming worse between pre- and post-test for the experimental group in comparison to 4.2 items (28%) for the control group. Thus, parents in the control group observed their children to demonstrate more negative sibling interactions throughout the course of the program relative to parents of children in the experimental group. The proportion of behaviors that improved and stayed the same did not differ as a function of treatment group.

Did They Do What We Taught Them?

The next set of analyses evaluated the extent to which children in the experimental and control groups demonstrated the social skills we taught them in their live interactions with their sibling and, further, whether the demonstration of these skills was correlated with parents' reports of positive sibling relationships. Mean frequencies of observed social skill use for the 30-minute pre- and post-test home observations are presented in Table 5.

Children in both groups were much more likely to initiate play with a sibling at both pre- and post-test than respond appropriately to an invitation to play or demonstrate rudimentary perspective-taking skills.

A 2 (treatment condition) x 3 (social skill type) repeated measures ANCOVA revealed a significant interaction effect for social skill and observation, $F(2,37) = 28.31$, $p < .001$. This suggests that children demonstrated the three targeted social behaviors to different degrees at the two observations. Follow-up analyses indicated a significant treatment condition by observation interaction effect for perspective-taking, $F(1,37) = 3.39$, $p < .05$. A similar treatment condition by observation interaction effect for accepting a sibling's invitation to play reached marginal significance, $F(1,37) = 3.06$, $p < .06$. As shown in Table 5, children in the experimental group engaged in more perspective-taking and were more likely to respond positively to their sibling's requests to play following participation in the program whereas children in the control condition reduced their use of these skills.

We next tested whether greater improvement in sibling relationship quality, as perceived by parents, was related to greater enactment of the social skills at post-test. Change scores were computed indicating the degree to which children improved on each of the SRQ scales from pre- to post-test. Partial correlations were then computed between these change scores and the observational measures of social skill use with siblings at post-test, controlling for pre-test levels of social skill use.[2] Children in the experimental group who were rated by their mothers on the SRQ as showing more Warmth in their sibling interactions at post-test were observed to exhibit more perspective-taking ($r = .47$, $p < .05$) and initiation of sibling play ($r = .37$, $p < .10$) in their post-test interactions with their sibling, when controlling for their initial levels of skill use. These associations were not significant for the control group ($r = .05$ and $-.12$, respectively). Furthermore, R to z transformations indicated that the differences between the corresponding correlations were significant at $z = 1.91$, $p < .06$. In addition, children who were rated by their mothers as showing less Rivalry in their sibling interactions at post-test were observed to exhibit more frequent initiation of sibling play ($r = .45$, $p < .05$) and more perspective-taking ($r = .33$, $p < .10$), when controlling for pre-test levels. Again, the corresponding partial correlations were not significant for the control group ($r = .06$, and .05, respectively). The difference in the partial correlations for initiation of sibling play derived from the experimental and control groups was significant at $z = 1.67$, $p < .10$. No significant partial correlations were obtained when mothers' reports of improvements in sibling Conflict were correlated with observed social skill use.

Moderating Variables

The next set of analyses investigated whether children who demonstrated the most gains in sibling relationship quality and acquired more social skills through the program had particular characteristics. No significant associations were found between changes in the sibling relationship quality scales and any of the age or gender variables. As for temperamental characteristics, greater improvement in mothers' reports of sibling Warmth and Closeness (SRQ) was found when elder children were reported to be higher in emotionality, $r = .48$, $p < .05$. Treatment gains were not associated with the occurrence of internalizing or externalizing behavioral patterns. Although there was no evidence to suggest that changes in sibling relationship quality were affected by family structure or SES, greater improvement in sibling Warmth and Closeness and Conflict was evident when mothers of children in the experimental group worked fewer hours outside the home, $r = -.58$, $p < .01$ and $r = -.47$, $p < .05$, respectively. Thus, children may benefit most from the program when an adult is available to support the acquisition of social skills at home. More improvement in sibling Rivalry was related to fathers' reports of less cohesion in the family, $r = -.48$, $p < .05$. No associations were found between changes in sibling relationship quality in accordance with parental reports of marital quality.

Table 5
Observed Social Skills Use during Pre- and Post-test Free Play Interactions with Siblings

	Experimental Group		Control Group	
Social Skill	*M*	*SD*	*M*	*SD*
Initiation of Sibling Play				
Pre-test	20.20	(13.00)	19.14	(15.16)
Post-test	17.90	(12.43)	19.55	(17.57)
Accepted Sibling's Invitation to Play[a]				
Pre-test	3.42	(2.61)	3.57	(4.14)
Post-test	5.30	(5.08)	2.50	(3.99)
Perspective-taking[b]				
Pre-test	1.74	(2.73)	2.76	(3.92)
Post-test	2.75	(4.12)	1.40	(2.56)

[a]Treatment Condition x Observation effect, $F(1,37) = 3.06$, $p < .06$.
[b]Treatment Condition x Observation effect, $F(1,37) = 3.37$, $p < .05$.

With respect to the demonstration of more social skills between pre- and post-test, we found that elder children were more likely to show an increase in accepting an invitation to play from their younger sibling when that sibling was older, $r = .48$, $p < .05$, when the family was viewed by fathers to be more cohesive, $r = .49$, $p < .05$, and when the younger child[3] was described as having fewer internalizing, $r = -.70$, $p < .05$, externalizing, $r = -.80$, $p < .001$, and total behavior problems, $r = -.83$, $p < .001$ at pre-test.

Consumer Satisfaction

Significant differences were found between parents' reports of how helpful the program was to their family in accordance with treatment condition. Whereas 70% of the parents in the experimental group either agreed or strongly agreed with the statement that the program was helpful to their child ($M = 2.29$, $SD = .47$), only 30% of the parents in the control group ($M = 2.85$, $SD = .99$) endorsed those items, $F(1,27) = 3.65$, $p < .06$. Similarly, whereas 70% of parents in the experimental group ($M = 2.24$, $SD = .90$) indicated that they would consider enrolling their child in future sessions, only 38% of parents in the control group ($M = 3.00$, $SD = 1.35$) responded in this manner. Furthermore, whereas 82% of the parents in the experimental group ($M = 1.76$, $SD = .75$) said that they would recommend this program to other parents, only 45% of the parents in the control group ($M = 2.69$, $SD = 1.11$) endorsed this response, $F(1,27) = 7.23$, $p < .01$.

Responses to the open-ended questions on the final evaluation suggested that parents in the experimental condition perceived their children to have become more interested in initiating interaction with their younger sibling, learned the targeted social skills, and to have benefitted from the program's emphasis on promoting prosocial sibling behaviors rather than reducing conflict. In contrast, several parents of children in the control group remarked that although their children enjoyed coming to the sessions they were not sure that they learned anything. Several par-

ents remarked that exposure to stories and videotapes that dramatized problems in sibling relationships may have been counterproductive as they represented opportunities for "rehearsing and refining the negative points of sibling relationships." Recommendations for enhancing the program made by parents of children in the experimental group included adding more campus and home sessions, involving younger siblings in the campus sessions whenever possible, and including scenarios that reflect the sometimes "irrational" behaviors of younger siblings.

Discussion

Results of this study support the assertion that social skills training may be useful in setting the sibling relationship on a positive trajectory. Social skills training in the peer context may promote prosocial sibling encounters as well as decrease some forms of negative interactions between siblings. As detailed above, there is evidence to suggest that sibling-relevant social skills training may be associated with either mothers' or fathers' reports of: (1) increased sibling warmth; (2) decreased levels of sibling rivalry; (3) stable levels of agonistic and competitive sibling interactions; (4) lower levels of problematic sibling behaviors; and (5) a lower status/power differential. Furthermore, children in the experimental group who were rated by their parents as getting along better with their sibling at post-test were more likely to demonstrate the social skills that we taught them during actual sibling interactions, particularly perspective-taking and initiating play. These associations were not found for children in the control condition. Thus, although unique improvements were not found for the social skills training group on every dimension studied, there is evidence to suggest that this type of program can promote more prosocial sibling interactions among young children.

Taken together, the results of the present study support the use of the peer group as an effective context for helping children to acquire and practice social skills relevant to sibling relationships. As suggested in previous research (Kramer & Gottman, 1992; Stocker & Dunn, 1990), children's interactions with peers may indeed help prepare them for encounters with younger siblings. The finding that perspective-taking was associated with greater reported improvements in sibling warmth and rivalry is consistent with Howe and Ross' (1990) suggestion that sibling relationship quality may be enhanced by strengthening children's perspective-taking abilities. In line with Kramer and Gottman's (1992) results, children in the current study who improved the most in sibling relationship quality were more likely to initiate play and conversation with their sibling.

The ability to engage in role playing activities and to receive feedback from peers and instructors in a non-emotionally volatile environment may provide children with opportunities to plan how they can make their time with their sibling more fun. In addition, the emotional support received from children experiencing similar circumstances with their own siblings may also contribute to the effectiveness of social skills training. Furthermore, teaching siblings social skills within the peer context may be economical. Since many children face similar challenges in relating to siblings, it is sensible to work with multiple children at once within existing peer groups, for example, in schools, after-school programs, religious institutions, or summer camps.

The decision to provide social skills training to children in small groups was prompted by a desire to help large numbers of children. It was also consistent with recent research on peer-sibling linkages (Kramer & Gottman, 1992; Stocker & Dunn, 1990). However, it is possible that different effects may be found if social skills are taught in a different context, for example, exclusively in the home with the sibling dyad or by including parents as coaches. It will be important to empirically test for differences due to training context in subsequent research.

The Significance of More Negative Sibling Interaction Among the Control Group

To provide a rigorous test of the effectiveness of social skills training, an alternate condition was devised that controlled for attention from peers and supportive group leaders, as well as structured opportunities to consider common challenges that arise in sibling relationships. However, the discovery that children in the control group demonstrated more negative interactions with their sibling over time was surprising. This opens the possibility that some of the typical methods (e.g., books and videotapes) used by many parents to help their children get along better may inadvertently increase the amount of negative interactions between siblings. This explanation, although disturbing, was voiced spontaneously in the final evaluation form by several parents in the control group. An alternative explanation may be that children in the 4- to 6-year-old age range normally exhibit worse sibling relationships as their younger siblings age and become more mobile and capable of interfering with their activities. Furthermore, social skills training may have been successful in mitigating these negative effects in the experimental group. The veracity of these explanations should be tested in future research by studying sibling dyads with diverse age spacings and by including a wait list control condition. If it is true that materials from the popular press are associated with iatrogenic effects, we would expect that sibling relationship quality would decline with the popular press materials but remain stable over time for children in the wait list control condition. In contrast, declines in sibling relationship quality for the wait list control condition would suggest the presence of developmental effects.

Limitations of the Current Study

Several caveats need to be considered when interpreting the current results. First, due to the small number of subjects involved in this pilot program, statistical power was limited. Large changes between pre- and post-test scores were needed to produce statistically significant findings. It is also important to note that the current sample represents a non-clinical sample. Parents did not view their children as having significant sibling relationship difficulties when they began the program. The use of a larger and clinically-referred sample would probably have revealed more significant differences between the treatment conditions. Thus, the current findings are best viewed as showing the potential of social skills training to prevent sibling strife among non-distressed 4- to 6-year-old children and their younger siblings.

The present program consisted of only four teaching sessions within the peer context. Although one could argue that the obtained results are impressive given the fact that only four sessions were used, it may be advantageous to include more teaching sessions. However, this may be expensive and may create scheduling problems for families that may lead them to avoid participating. Future researchers may need to be creative in determining how to increase the time allotted for training but still keep the program short and intensive.

Program effectiveness may also increase with additional generalization training sessions in the home. The efficiency in terms of children's learning gains and program costs would need to be carefully evaluated to support this expansion. It may also be desirable to incorporate additional social skills into the curriculum such as more varied techniques for managing conflicts or dealing with angry or emotional siblings. Furthermore, the parental component of the program may be enriched to include structured sessions that focus on additional ways to encourage the use of social skills at home. A formal series of training sessions, although possibly expensive, may be more effective in helping parents to support the generalization of training to the home. Again, the cost-effectiveness of this addition would need to be critically evaluated.

Finally, the participants in the current study were demographically homogeneous. Very different results may emerge with families who represent a different structure, ethnicity, or socioeconomic status, and with children of different developmental levels.

In summary, the present study suggests that a method of directly training prosocial sibling behaviors within the peer context may be beneficial for improving sibling relationship quality. Although additional research is needed to replicate the present findings, it appears that helping children to learn effective ways to relate to a sibling early on may be a most productive way of setting their relationship on a positive trajectory.

Notes

[1]Similar results were obtained when the age difference between the siblings served as the covariate.

[2]Given that partial correlations necessarily produce lower correlations than univariate correlations, and because of the exploratory nature of this investigation, we report partial correlations that are significant at $p < .10$.

[3]These analyses refer to younger children over 24 months of age.

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