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Enhancing Sibling Relationships to Prevent Adolescent Problem Behaviors: Theory, Design and Feasibility of *Siblings Are Special*

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Abstract

Siblings play a significant but neglected role in family socialization dynamics, and focusing on the sibling relationship is a non-stigmatizing point of entry into the family for prevention programming. *Siblings are Special (SAS)* was designed as a universal program that targets both sibling relationship and parenting mediating processes in middle childhood to prevent behavior problems in adolescence. We describe the theoretical framework underlying *SAS*, the *SAS* curriculum, and the feasibility of the program based on a study of 128 middle-childhood aged sibling dyads. Data on the quality of program implementation, program fidelity, siblings' engagement, and ratings of impact indicated the *SAS* program was acceptable to families and schools, that the curriculum could be implemented with high fidelity, that siblings and parents participated at high levels and were highly engaged, and that, from the perspective of group leaders, school administrators and parents, the program had a positive impact on the siblings.

Keywords

Prevention; Siblings; Family; Middle Childhood; Early Adolescence; Risky Behavior; Substance Use

Enhancing Sibling Relationships to Prevent Adolescent Problem Behaviors: Theory, Design and Feasibility of *Siblings Are Special*

Sibling relationships are central in individual and family life. Although family size in the U.S. has declined, most individuals have at least one sibling, and siblings play an important role in children's daily experiences. Indeed, children in the U.S. today are more likely to live in a household with a sibling than with a father (McHale, Kim, Whiteman & Crouter, 2007). Furthermore, time use research shows that European American children spend more of their free time with siblings than with anyone else, and among minority groups with strong familism values, siblings serve important roles as caregivers and companions (McHale et al., 2007).

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Although largely neglected by prevention scientists, sibling relationships influence adjustment and development across the lifespan in spheres ranging from peer and romantic relationships, health and health risk behaviors, and pro-social versus anti-social life course trajectories. The research summarized below supports the idea that strengthening sibling relationships is an ideal approach for promoting healthy family functioning, fostering youths' psychological health and social competence, and preventing health risk behaviors such as substance use. However, despite the substantial influence of sibling relationships on pro- and anti-social life course trajectories, only a handful of intervention programs has targeted sibling relationships (e.g., Bank, Kothari, Snyder, Wilson, & Feingold, 2011; Kramer, 2004; Siddiqui & Ross, 2004).

Toward developing a framework for sibling-focused prevention, we first provide a conceptual model, distilled from current research, which captures the pathways through which sibling relationships in middle childhood influence the later risk behaviors of each child. Next, we describe the *Siblings Are Special (SAS)* prevention program, which was built on this conceptual frame and designed to promote positive sibling and family relationships and enhance youth well-being; *SAS* also was designed to overcome the pervasive problem of low family participation in youth-oriented prevention programs. Finally, we provide an overview of a randomized trial of the program, and present data to demonstrate that the program can be implemented with fidelity in an afterschool setting and to document its appeal to youth, parents, and school personnel.

How Do Siblings Influence Youth Development and Adjustment?

Beginning in early childhood, sibling interactions provide an arena for developing and practicing relationship skills. Close, everyday contact coupled with the emotional intensity of many sibling exchanges fosters the development of social understanding (e.g., Dunn, 1998), and social support from siblings plays a role in adjustment beginning in childhood. For instance, sibling warmth is linked to peer acceptance and social competence in childhood (Stormshak, Bellanti, Bierman, & CPPRG, 1996), and to later intimate relationships (Bank, Patterson, & Reid, 1996). Lifelong bonds between siblings develop because of the time siblings spend together, the support and guidance they provide, and the family identity and experiences they share.

Sibling relationships involve more frequent and intense conflict than other close relationships. Observational research shows that sibling conflict and aggression are common (Berndt & Bulleit, 1985). In a survey of family conflict, 70% of families reported physical violence between siblings, and over 40% of children were kicked, bitten, or punched by their siblings during a one year period (Steinmetz, Straus, & Gelles, 1981). During their conflictual exchanges, siblings serve as models and shape one another's emotional responses and social behaviors. In their everyday shared activities, they also can expose one another to antisocial attitudes, behaviors, and peers (Patterson, Dishion, & Bank, 1984). Sibling reinforcement is particularly important in the development of antisocial behaviors, such as colluding against parental authority, and risk behaviors, such as substance use and delinquency. The term, sibling deviancy training, was adapted from research on peer deviancy training and is used to describe these mutual reinforcement processes between siblings (Bullock & Dishion, 2007).

Given the foregoing brief summary of research on sibling relationships, it is not surprising that the characteristics of these relationships have been linked to a range of child and adolescent outcomes, including depression, identity and self esteem, aggression, delinquency, school adjustment and achievement, peer and romantic relationships, and substance use and other health risk behaviors. Sibling relationship effects are evident even

after the effects of parent-child and peer relationships are taken into account (Kim, McHale, Crouter, & Osgood, 2007; Rende, Slomkowski, Lloyd-Richardson, & Niaura, 2005).

Sibling relationships develop within a family system: Parenting and parent-child relationships impact sibling relationship quality, with harsh and authoritarian parenting linked to more conflictual sibling relationships (McHale, Updegraff, Tucker, & Crouter, 2000), and sibling relationships also influence the quality of parent-child and marital relationships (Dunn, Deater-Deckard, Pickering, & Golding, 1999; Stocker & Youngblade, 1999). For example, siblings who argue and fight frequently may elicit harsh and authoritarian parenting and even parental withdrawal. Indeed, parents report that sibling conflict is their most significant child-rearing challenge (Perlman & Ross, 1997) and the most frequent source of parent-child disagreements (McHale & Crouter, 1996).

A Model of Sibling and Family Influences on Youth Development and Adjustment

Our theoretical model, shown in Figure 1, builds on the research literature on sibling influences to target the key pathways through which sibling conflict can affect youth development and adjustment. The first pathway extends through siblings' experiences outside the family, primarily with peers and in school settings. The second pathway emerges within the family. Our ideas about several of these mechanisms are informed by the work of Patterson and colleagues (Bank, Burraston, & Snyder, 2004; Patterson, 1984; Patterson, DeBaryshe, & Ramsey, 1989).

The extra-familial peer/school pathway begins with siblings' reinforcement and modeling of one another's coercive interactional behaviors, behaviors that arise in the context of sibling conflict (Slomkowski, Rende, Conger, Simons, & Conger, 2001). The central idea is that, via negativity and coercion, the sibling relationship represents a "training ground" for the development of a generalized negative, conflictual, and coercive interpersonal style associated with poor self control (Patterson, 1984). As with coercion in the parent-child relationship, which has received the greatest amount of research attention, children internalize a working model of conflict resolution as based on coercion, and generalize this approach to peers and others outside the family. Patterson et al. (1989) report that youth who develop this negative interpersonal orientation encounter relational difficulties at school with peers and are perceived negatively by teachers (Lewin, Hops, Davis, & Dishion, 1994; Stormshak, et al., 1996). These youth then affiliate with peers who have similar problematic interpersonal and behavioral styles, both as a result of their own friendship choices as well as educational grouping into low achieving and behavior disorder classes (Dishion, Patterson, Stoolmiller, & Skinner, 1991; Patterson, et al., 1989). As a result of conflicts with teachers, these youth also develop low levels of school attachment, and their affiliations with similar peers reinforce negative school attitudes and behaviors (e.g. skipping class, disruptive behavior). Finally, affiliation with antisocial peers represents the proximal context for exposure to and reinforcement of serious antisocial behaviors and substance use (Erickson, Crosnoe, & Dornbusch, 2000; Keenan & Shaw, 1995; Patterson, et al., 1989; Wills & Cleary, 1999).

Evidence supports the influence of *sibling reinforcement of coercive style* on problem behaviors via peer difficulties. As noted, hostility and aggression between siblings are common (Patterson, 1984; Straus, Gelles, & Steinmetz, 1980) and predict antisocial behavior and substance use (Bank, et al., 2004; Brody et al., 2003). Sibling conflict also is associated with lower peer/social competence (Bank, et al., 2004; Stormshak, et al., 1996), and peer problems are linked to lower school attachment and deviant peer groups (Dishion, et al., 1991; Patterson, et al., 1989). In this way, sibling conflict and coercion can lead to risky behavior through its effects on youth's experiences in school and with peers.

A second mechanism in the model operates through the sibling relationship itself. We described how sibling deviancy training can promote antisocial and risk behaviors. Siblings aid in deviancy training by serving as antisocial models, reinforcing antisocial behaviors and attitudes, and colluding to undermine parental authority (Bullock & Dishion, 2002). Siblings also act as partners in crime, engaging together in risky behaviors (Rodgers, Rowe, & Harris, 1992), and they may expose each other to risks, including illicit substance use, delinquent behavior, and association with antisocial peers (Bank, et al., 2004; McGue & Sharma, 1995). Of special concern is that older siblings and their friends expose younger siblings to risky activities.

Another important pathway operates through broader parenting and family dynamics, and is grounded in an ecological systems framework (Bronfenbrenner, 1979). The *family effects* model posits that conflictual and coercive sibling interaction is a stressor for parents (McHale & Crouter, 1996) and disrupts competent, engaged parenting—which leads alternately to harsh and authoritarian discipline and parental disengagement (Dishion, Nelson, & Bullock, 2004; Patterson, et al., 1984). Prior research links sibling conflict to parental negativity and low levels of parental involvement, knowledge, and monitoring (Brody, Kim, Murry, & Brown, 2003; Kim et al., 2007). Other research shows how negative sibling interactions reverberate through the family system, with impacts on the inter-parental relationship (Stocker & Youngblade, 1999), which is a powerful influence on parental adjustment and parenting quality. Thus, the disruptive effects of sibling conflict on parenting competence and family relationships can undermine several factors important for promoting positive child adjustment.

The theoretical model presented is based on studies with varying degrees of controls for internal validity. For example, some of the literature used to support the pathways may not account for sibling correlations that are due to genetic similarity between sibling pairs (e.g., Kim, McHale, Crouter, & Osgood, 2007; Patterson, 1984; Rende, Slomkowski, Lloyd-Richardson, & Niaura, 2005). Other studies that use more rigorous designs (e.g., Rodgers, Rowe, & Harris, 1992) provide evidence that sibling effects can be shown even after controlling for shared genetic factors. Taken as a whole, the sibling effects literature provides strong support for the effects siblings have on each other.

Implementation Feasibility

As a result of the joint action of several sets of processes, negative sibling relationship qualities and experiences operate as risk factors for youth adjustment problems. As risk factors, sibling dynamics are an important focus of preventive intervention with youth. An intervention focused on sibling relationships is warranted for other reasons, as well. Currently, the most widespread substance use prevention programs for youth are school-based approaches focused on modifying youths' attitudes towards substance use and enhancing skills for self control and peer relationship management. Such programs can achieve high penetration rates, but relatively low dosage leads to small effects. Less widespread are family-focused prevention programs. Such programs can achieve larger effect sizes, but often achieve limited family recruitment. For universal, family-focused interventions, recruitment rates have ranged from 3% to 35% (Heinrichs, Bertram, Kuschel, & Hahlweg, 2005; Meek, Lillehoj, Welsh, & Spoth, 2004; Spoth, Clair, Greenberg, Redmond, & Shin, 2007). Programs requiring attendance at multiple sessions conducted outside of the home tend to have rates in the lower part of that range (Meek, et al., 2004; Spoth, et al., 2007), given their higher level of demands on families' time and resources. *SAS* was designed to overcome these barriers by appealing to a primary parent complaint (sibling conflict), and staging readily accessible program delivery.

In addition to assessing the appeal of the program to families, this feasibility study also was aimed at assessing whether the program could be implemented with fidelity. One of the important barriers to effective implementation of evidence-based programs is a breakdown in processes supporting high implementation quality when programs are implemented under real-world conditions (Durlak & DuPre, 2008). Thus, our goal was to implement the program under as close to real-world conditions as possible in order to illuminate issues regarding fidelity, beginning with this feasibility pilot. We invited a wide range of schools, across a large region of a northeastern state, which included rural and non-rural communities and populations with a mix of ethnic backgrounds. We hired Group Leaders who would be likely intervention staff in a dissemination stage—i.e., a mix of college students interested in working with youth and professional school personnel such as teachers and guidance counselors.

In addition to assessing the quality of the implementation across several domains, such as the perceived quality of the group leader training, the quality and fidelity of Group Leaders' program delivery, we also were interested in participant reaction to the program. Thus, we assessed the level of participation in the program and the perceived utility of the program components.

In summary, as a first step in documenting the utility of *SAS*, we describe a pilot implementation of the program with middle childhood-age sibling dyads. Although the implementation occurred in the context of a randomized trial, we report only on feasibility here as collection of outcome data is ongoing. In the following pages we provide an overview of the *SAS* curriculum and then use data collected as part of our study: (a) to assess the quality of program implementation including, quality of Group Leader (GL) training; (b) to measure the fidelity of program implementation using both objective observer ratings and GL reports; (c) to document siblings' engagement; and (d) to provide a preliminary assessment of perceived program impact.

METHODS

The *Siblings Are Special* study was designed both as a feasibility pilot and a multisite randomized control trial. Elementary schools were invited to participate and asked to assist with recruitment of sibling dyads. Within each school, sibling dyads were randomly assigned to receive the intervention or control conditions. The *SAS* curriculum was designed to be delivered by two trained GLs in a series of twelve weekly 1.5 hour sessions plus an additional three, 2.5 hour family-night sessions interspersed throughout the program. The intervention groups consisted of 4 sibling dyads. Outcome data, not reported here, are being collected at pretest, posttest, and one-year follow-up through home visits.

Participants

Families were recruited from elementary schools in Central Pennsylvania. A total of 128 sibling dyads ($N=256$ children) were recruited. Each dyad included a 5th grader and a younger sibling in the 2nd through 4th grades. "Sibling" was defined by social role as opposed solely to biological relatedness: Dyads living in the same household for at least the past three years, who shared the same parental figures, were included in the study. Of the sibling dyads in the sample, 6 did not share the same biological father and 1 did not share the same biological mother. The sample included 106 dual-parent, 19 single-mother, and 3 single-father families. At pretest, 125 mothers and 97 fathers provided data.

School districts and their constituent schools with kindergarten through 5th grade classrooms were identified within a two hour driving radius of the study team's university, a region that included rural areas, towns and small cities. A total of 71 schools were invited to participate;

of these, 32 were considered passive refusals (i.e., did not contact us) and 21 were active refusals, citing reasons such as competing commitments, school improvement projects, school construction, struggles with budget and staff cuts, or lack of interest. Of the 18 schools that agreed to participate, 2 did not have sufficient numbers of eligible families. The remaining 16 schools implemented *SAS*. Participating schools and non-participating schools had very similar characteristics along dimensions for which we had data, such as size of school (5th grade cohort average was 80 students in participating and 78 in non-participating schools), proportion free/reduced lunch (49% vs. 52%), and proportion White (67% vs. 76%).

Following school recruitment, invitations were sent to all eligible families with a fifth grade student and a younger student in 2nd through 4th grade. Interested families returned a postcard or contacted us by phone or email. In some cases, school staff assisted by calling families as a follow-up to the letter. We were unable to obtain precise information on the number of families meeting eligibility requirements in two schools, but in the remaining 14 schools where we had such information, there were 289 eligible families, of whom 113 (39%) agreed to participate.

Data collection and study protocols were approved by the University's Institutional Review Board. Families in the intervention and control conditions received a popular book on parenting siblings to avoid sibling rivalry (Faber & Mazlish, 1998) and monetary compensation for each wave of data collection. In addition, intervention siblings were told that they would receive \$2 for each program session they attended with an additional dollar for perfect attendance. Due to the overall high rates of program attendance, we decided to compensate all children for the maximum amount (\$25); to maintain comparability across conditions, we gave control children the same amount. Each school received \$500 to offset costs for facility use.

The SAS Program

As a universal, school-based intervention focused on siblings, *SAS* was designed to be non-stigmatizing. Concerns about sibling conflict are common in parents, and the program targets children's relationships, not parents' behavior. Instead, parents were involved in a collaborative and supportive role through biweekly contact with GLs and through family sessions where they learned about program activities and how to encourage children to practice the program tools at home. From a family systems perspective, enhancing sibling relationships influences parenting and parent-child relationships by reducing the need for parent intervention in sibling disputes, reducing parent and inter-parental stress, and promoting family warmth.

The intervention was aimed at middle childhood aged children for both strategic and practical reasons. First, it was designed to promote sibling and family relationships just prior to older siblings' transition to middle school, a risk-related transition. In addition, middle childhood is a primary focus of social skills training interventions, and a body of work documents the efficacy of such programs (Bierman, 2004). Social skills training programs may be especially effective for children at this age because children are able to learn and practice basic principles of social problem solving; further, allegiances to the peer group have not yet undermined the referent power of adult GLs or overshadowed the salience of dependency needs within the family. We also focused on this developmental period because it is characterized by the centrality of siblings in one another's daily activities: In middle childhood, children spend more of their free time with siblings than they do with either parents or peers (McHale et al., 2007). Finally, the timing of the intervention was practical. The presence of both siblings in a single school building facilitates bringing both children together after school and transporting them home. In addition, parents' attendance at family

sessions at the local elementary school is convenient, uses a familiar location, and supports family-school relationships which are valued by school administrators.

In *SAS*, skill learning takes place within the context of the sibling relationship; generalization to the home is expected given that both relationship partners have learned the skills together and that parents are able to coach them, thereby supporting those skills. *SAS* promotes skills in six domains, hypothesized to mediate impact on child and sibling relationship adjustment (see Figure 2).

(1) We conceptualized *sibling relationship skills* as emotion understanding and self control, perspective taking, social problem solving, conflict resolution, and fair play skills. These skills are the focus of most contemporary social skills training programs for school age children (Bierman & Erath, 2006). *SAS* strategies for promoting these skills were adapted from the evidenced-based PATHS social-emotional curriculum (Greenberg, Kusche, Cook, & Quamma, 1995) and the Fast Track social skills training curriculum (Bierman, Greenberg, & Conduct Problems Prevention Research Group, 1996).

Beyond skills required in egalitarian, peer-like relationships, the curriculum incorporates the complementary role elements of the sibling relationship, focusing on skills pertaining to older siblings' roles as models, caregivers, and sources of advice, and younger siblings' roles as family members and responsibility for their own behaviors and contributions to the sibling "team." The program supports both siblings' perspective-taking around roles and status differentials and encourages both siblings to serve as role models by practicing their skills at home in front of their parents and sibling.

(2) *Cognitions regarding sibling relationships* were operationalized in terms of children's attributions about their siblings' intentions and goals in the sibling relationship, as well as their attitudes and norms about sibling and family roles. The curriculum aimed to enhance children's actual and perceived efficacy in working out "win-win" solutions to sibling disagreements and conflicts. We expected that attributions of blame and negative intentions would diminish through promoting siblings' understanding of family roles and relationship norms and increased social understanding and problem solving skills.

With respect to relationship norms, the curriculum was designed to reduce negative attributions that blame a sibling for inequities by building children's normative beliefs about the age-graded nature of privileges, competencies and responsibilities. In addition, a primary goal of the program was to build siblings' view of the dyad as a mutually supportive team by fostering siblings' awareness of how they are alike, by increasing their involvement in shared constructive activities, and by promoting their understanding that, in a close relationship as in the case of team membership, the well-being and success of the self is intrinsically connected to that of the partner. By enhancing siblings' sense of "we-ness" or "team," and older siblings' recognition of the extent to which they serve as models for younger siblings, our goal was to motivate older siblings to act as protectors for younger siblings and to reduce the likelihood that they would expose younger siblings to negative influences such as deviant peers and risky attitudes and behaviors. We also expected the older siblings' recognition of their role and responsibilities to translate into an enhanced commitment to avoid experimentation with substances.

(3) The program aimed to promote *sibling relationship activities* in terms of time siblings spend together, who else is present (e.g. parents, peers), and what activities siblings engage in (e.g., hanging out vs. playing games). Prior work has established a link between time spent in unstructured and unsupervised activities and risky behaviors; the underlying mechanisms include boredom, lack of attachment to social institutions and positive adult role models, and opportunities to engage in risky behaviors that arise outside of adult

supervision. In contrast, involvement in constructive activities such as hobbies or organized sports marks opportunities for acquiring competencies and skills, fosters close relationships, and promotes identity formation (McHale, Crouter, & Tucker, 2001). Younger siblings are more likely to model the positive qualities of their older siblings when the two spend time on constructive activities together, and they are more likely to model negative sibling qualities when the siblings spend time together in unstructured situations, such as hanging out. Further, siblings' time in constructive activities and activities that include parents is linked to positive adjustment and family dynamics (McHale, et al., 2007). In *SAS*, we aim to enhance sibling joint decision-making regarding shared time and by fostering parental involvement in orchestrating and joining in constructive activities with the sibling dyad.

(4) *Parental behavioral management* includes parents' strategies for promoting positive and minimizing negative sibling exchanges. Improving parents' behavior management skills, such as establishing rules and providing reinforcement and consequences, is a common approach in parent programs that focus on management of a single child. Parent-focused interventions that have addressed sibling relationships also have targeted parents' behavior management skills, with documented short term positive effects (Kennedy & Kramer, 2008; Siddiqui & Ross, 2004).

(5) *Parental mediation of sibling conflict* refers to parental strategies for helping siblings resolve their conflicts. In naturalistic settings parental intervention frequently involves providing solutions or using threats of punishment to keep siblings from fighting (Perlman & Ross, 1997; McHale et al., 2007). Controlling and authoritarian strategies do not provide opportunities for siblings to learn and adopt a negotiation-oriented conflict resolution style, however, and are linked to more sibling negativity. In contrast, when parents act as mediators, they help siblings resolve conflicts and enhance siblings' feelings of efficacy and competence regarding their relationship. Even a brief (1.5 hour) parent intervention promoting mediation of sibling disputes was found to reduce levels of sibling conflict; conflict resolution styles also changed in the direction of greater child self-direction and control (Siddiqui & Ross, 2004). The *SAS* curriculum used a similar but even briefer approach in the context of family nights to teach parents mediation skills for intervening in sibling conflict, and to help them gauge when to apply these mediation skills versus behavior management techniques.

(6) *Parental involvement in siblings' activities* includes parents' time spent with siblings as well as parents' orchestration and knowledge of siblings' shared activities. Parental involvement and monitoring are important themes in current evidence-based family programs targeting adolescent substance use and other risk behaviors. As noted, the curriculum aimed to foster parents' abilities to help their children become involved in mutually enjoyable, constructive activities together and to sensitize parents about the importance of both their knowledge of and direct involvement in their children's activities. This material was framed in terms of the family's preparation for the challenges of emerging adolescence and conveyed during a family night session. In addition, sibling homework activities were designed to elicit the assistance or involvement of parents with the dyad.

As in many programs developed for use with children, we utilized concrete images, phrases and labels when possible to encapsulate cognitive-behavioral and relational strategies. For example, we utilized "Feeling Balloons" to describe degrees of emotional experience, traffic lights to guide self-regulation, and a "Compliment Circle" as a routine means of ending a group session that families could incorporate into their week.

Program Implementation and Fidelity

The *SAS* curriculum was delivered by pairs of GLs, who were selected based on their experience working with children and leading groups or teaching. GLs received a total of 24 hours of formal training delivered across 3 days spread throughout the intervention period. Supervision consisted of weekly conference calls between project staff and each GL pair after each session, as well as feedback on audiotaped sessions. The afterschool program consisted of 12 weekly group sessions for each group of four sibling dyads, delivered by two trained GLs. The sessions included limited didactic presentation, active games, some written exercises, role-playing, and discussion. Sessions began with a fun warm-up activity or review, then continued with a mix of discussion and skill application, and always ended with a “Compliment Circle” in which each sibling dyad was encouraged to share a compliment about their sibling with the group (Bierman, et al., 1996). Three “Family Fun Night” sessions were scheduled to be evenly spaced throughout the 12 after school sessions. During the first half of each session, parents learned the tools and techniques being taught to their children in the after-school sessions and how they could best support and coach their children in applying those skills at home. Simultaneously in a separate room, children reviewed activities that they collectively taught their parents when families reconvened. The second half of the family sessions entailed a demonstration by the siblings to their parents and a fun activity that each family engaged in together to practice skill application. These sessions ended with family members sharing compliments with each other.

Measures

Sources of Data—GLs ($N = 22$) recorded attendance and they completed both post-session and post-intervention ratings of implementation, fidelity, and participation engagement as well as a post-program rating of perceived program impact.

One observer coded the audiotapes of 3 sessions for each of the 16 groups of siblings for program fidelity and child engagement. The three sessions were the same for each group, and chosen to reflect an early, middle, and late session in the curriculum, and included variation in program activities and content. The observer was trained by two of the co-authors (MH and KS). After training, the two trainers and the observer each rated seven sessions for reliability purposes. Across all codes, 55% of pair-wise comparisons of the trainers with the observer were in exact agreement, and 99% of comparisons were within one point difference.

All intervention parents ($N = 64$ families) were asked to complete a feedback survey at the end of the final family night (if not present, they were mailed the survey). A total of 92 surveys were completed by parents from 57 families (in 35 families, both mother and father completed surveys; mothers only in 20 families; and fathers only in 2). In addition, 13 of 16 School Administrators (SA) completed a brief questionnaire describing their perceptions of program implementation and siblings’ engagement in the program.

Table 1 provides sample items, alphas, and ICCs for all measures described below.

Instruments: Engagement—GLs recorded attendance at all (afterschool and family night) sessions. To assess children’s engagement, we used observer, parent, SA, and GL reports. GLs rated siblings’ engagement after each session and at the end of the program; sibling collusion; and parent engagement at the family nights. As an indicator of the appropriateness of the program’s expectations for family involvement, mothers and fathers were asked to rate their satisfaction with the amount of involvement the program expected from parents.

Program Implementation Quality—Following program completion, GLs rated the quality of training and supervision and the overall quality of their teamwork. SAs rated the quality of program delivery in the school context.

Program Fidelity—The observer rated audiotapes of afterschool sibling sessions for fidelity of program delivery. GLs also rated their own fidelity to the manualized curriculum immediately following each session and an overall score at the end of the program. The percentage of content presented was calculated for each session and family nights by GL reports (i.e. “How much of the core information did you and your partner present for this session?”) and by observer ratings (i.e. “How much of the planned material did the Session Leaders cover during this section?”). Response choices ranged from 1=a little, <40% to 5=Nearly all, 95–100%. Answers were recoded to reflect the percentile range and means were taken across GL reports and Sessions.

Perceived Program Impacts—GLs rated their perceptions of the effects of *SAS* on the siblings. Mothers and fathers rated the perceived utility and family’s use of each of 6 “tools” with correlations between parents’ ratings of each tool ranged from $r = .30$ to $.62$ (all $ps < .05$). Finally, mothers and fathers rated how informative they found family nights.

RESULTS

Table 2 reports average scores for all of the measures of *SAS* program delivery. Beginning with *engagement*, program attendance was very high. The average attendance rate for child program participants across the 12 sessions was 88%. All dyads attended at least one afterschool session; one dyad stopped attending after the first session, and one dyad stopped attending after the third session. The average attendance rate for families at the family night sessions was 78% (average attendance excluding five families who did not attend any family night sessions was 85%). GLs, observers, SAs and parents provided positive ratings on *children’s engagement* in the afterschool sessions. Parents’ reports were particularly high as were SA ratings (all well above 4.0 on these 5-point scales). Mothers’ and fathers’ ratings also suggested that program expectations for their own involvement were “about right” (i.e., a score of 3 on this 5-point scale, where 1 = *too little* and 5 = *too much involvement*).

Ratings of *program implementation quality* by GLs and SAs also were very positive, above the mid-point of these 5-point scales or better. GLs also rated their teamwork highly, and they gave lower but still positive ratings to the quality of their training and supervision. SAs gave very high ratings to the relationship between the school and project staff and to children’s reactions to the afterschool sessions.

Fidelity of each session was rated by the GLs, and observers rated 25% of sessions as well. Means for both GLs and observers were high, approaching the ceiling, though there was some variability particularly in observer ratings. GLs reported that they presented 94% of the content across all sessions while observer ratings indicated that 84% of the content was presented. GLs also gave high ratings to the fidelity of the family night sessions and estimated that they presented 94% of the content. Finally, the GLs’ ratings of overall program fidelity approached ceiling.

Perceptions of *program impact* were obtained from GLs and parents. GLs provided an overall rating of the effects of the program on sibling relationships. Although GLs’ reports were variable, the average rating was well above the scale midpoint. Parents’ ratings of the 6 program tools revealed that mothers’ ratings were generally higher than fathers’, but that across both parents, compliments were the most highly rated tool, followed by the yellow and red lights, talking stick, feelings dictionary, and feelings thermometer. Because each

family may appreciate different program tools, we also examined the highest rating a parent gave to any of the tools. The average highest rating by mothers was 4.00 (SD= 0.91), and by fathers was 3.65 (SD = .90). In addition, 88% of mothers and 81% of fathers rated at least one tool as at least “somewhat” useful for their family (equivalent to the midpoint on the 1 to 5 rating scale).

DISCUSSION

Despite the substantial influence of sibling relationships on youth, few prevention programs have aimed to reduce mental health or problem behaviors by harnessing sibling influences. Through its focus on sibling dynamics and by promoting support for and involvement in the sibling relationship by parents, the *SAS* program was designed to promote individual, dyadic, and family-level changes. Specifically, *SAS* aimed to enhance siblings’ positive communication and problem solving abilities, increase sibling support while reducing sibling conflict, enhance positive parenting vis-à-vis sibling relations, and improve both parent and child adjustment. This report addressed whether the program design and content is acceptable to families and schools, whether families engage in the program, whether *SAS* can be implemented with fidelity by GLs, and whether, from the perspective of GLs and parents, the program had a positive impact. Future research will document program outcomes based on the randomized trial design when outcome data collection is complete.

A first issue is whether families will enroll in a sibling-focused program. It is difficult to generalize from participation rates attained in a study to real-world participation rates. Research studies include both barriers such as the burden of data collection, loss of privacy, and risk of data security breach, as well as incentives such as monetary compensation. In this study, data collection at pretest and posttest during family home visits included videotaped family interaction, which can be a significant barrier for some families. Nonetheless, the sibling relationship focus and school context seemed to have facilitated recruitment of eligible families: almost 40% of families with siblings in the target age range participated in the study. This is a high participation rate, especially in comparison to participation rates in other multi-session, family programs. As we had hoped, many parents seemed to welcome support around reducing sibling rivalry and conflict and improving sibling relationship quality. Moreover, this rate of participation was obtained for an experimental program; program recruitment may be even more successful if recruitment materials can discuss the demonstrated benefits for children and families of the program. Moreover, positive experiences for one cohort of youths and parents may be conveyed informally to later cohorts, thus building a positive reputation for a program over time and yielding greater participation. In such instances, parents may plan for program participation in advance; whereas our recruitment took place in the fall when extracurricular afterschool activities (especially sports teams) were already in place and sometimes conflicted with group scheduling.

Consistent with the relatively high recruitment rate, attendance at both sibling and family sessions was quite high. Attendance rates of almost 80 to 90% likely reflect a fairly high level of engagement and positive reception of the program. The high rate of family session attendance in particular was impressive, especially given the difficulties we sometimes experienced scheduling sessions around family/youth evening activities, as well as weather-related issues and cancellations that arose during the winter months in our target communities. Providing dinner no doubt facilitated attendance, however, dinner was usually only pizza, and thus not likely to have been the primary motivator. Our view is that siblings’ engagement in the program promoted their parents’ initial involvement given that the family nights were designed, in part, to allow the children to show their parents what they had been doing and what they had learned in the after school sessions. Once the parents attended a

family night, they then became engaged in the program themselves. Indeed, observers, GLs, and (especially) parents rated siblings as highly engaged in the sessions. Parents also reported that the expectations for family involvement were appropriate and, importantly, not too high; burdensome requirements can lead to frustration, resistance, and burn-out. Thus, the combination of generalization practice for the siblings to do at home, sometimes involving parents, and the three family sessions seemed to be an appropriate dosage from the parents' perspective.

The research study context may have had both positive and negative effects on school uptake of a prevention program, given both the general wariness of some administrators to outside research and untested programs as well as the interest displayed by other administrators in research and in providing innovative services for families. We achieved a lower participation level among schools than families in this initial effort. Administrators who declined participation cited competing demands, and in a few cases, lack of interest.

Administrators whose schools became involved in the study, however, provided very positive ratings of their school's experiences. Of particular importance regarding the feasibility of school-based prevention programs is the acceptability of the intervention to administrators. In this case, SAs gave high ratings to both their contacts with project administrative and intervention staff and their perceptions of students' reactions to the *SAS* program. These indicators may translate into administrators' ongoing support.

Implementation fidelity requires attention to training and supervision of facilitators. GLs who carried out *SAS* gave generally positive ratings of these experiences; however, the average score left room for improvement. In follow-up debriefing, GLs recommended more guidance for managing child problem behaviors. We noted that children seemed less well-behaved in the sibling as compared to classroom context. The sibling context can be emotionally powerful, and siblings have entrenched behavior patterns that can be difficult to manage. Thus, attention to behavior management skills is an important area for future training.

Both observers and GLs rated program fidelity quite highly. GL ratings were so high, however, that their average ratings neared the ceiling, and there was little variability. There is likely a self-report bias inherent in GLs' own reports of their fidelity in conducting the groups. The observer ratings, although a little lower than the GLs', were sufficiently high to yield the conclusion that the program was generally implemented with fidelity to the curriculum manual. In prior research on prevention programs, adherence ratings have been found to range from 40 to 90% across studies (Spoth, Gyll, Redmond, Greenberg, & Feinberg, 2011). Based on our review of several such studies, it appears that adherence ratings of 70% to 90% indicate a reasonably well implemented program that offers the opportunity for positive program outcomes (e.g., Botvin, Baker, Dusenbury, Tortu, & Botvin, 1990; Feinberg & Kan, 2008; Spoth, Shin, Gyll, Redmond, & Azevedo, 2006). Whether such outcomes are achieved, of course, depends on other factors, including the appropriateness of the actual content, match between content and participant needs, participant engagement, facilitator style. In this context, it appears we were successful in both designing a curriculum that was capable of being implemented well (i.e., not too complex, not too much material to cover in a limited amount of time) and training facilitators to do so.

Both GLs and observer ratings indicated high levels of sibling engagement in *SAS*, suggesting that the program appeals to children. The combination of high engagement and high fidelity impart confidence that children received intended program messages.

Across the domains assessed, the least impressive results were found for the perceived utility of the program tools. GL ratings of perceived impact on siblings and parent ratings of informativeness of the program as a whole were relatively high (about a 4 on the 5-point scale). However, average parent ratings of the utility and helpfulness of the specific tools taught were lower, generally about the mid-point on the scale range. On the other hand, not all tools will be helpful for all families, and 80% to 90% of parents identified at least one tool that was perceived to be at least somewhat helpful at home. Parents rated as most helpful the technique of giving compliments that was used in each sibling and family session, followed by the self-regulation traffic light tools.

We were surprised in this initial pilot to witness the depth of work involved in the compliment circles; often youth and sometimes parents were at a loss as to how to compliment family members. Over time, we developed greater appreciation for appropriate expectations regarding compliments and ways to stage instruction and promote development of the quality of compliments. Feeling identification and assessment tools were rated as less helpful. It may be that emotion identification and parental emotion coaching can be fostered through ways that do not involve such explicit tools. On the other hand, the compliment circles and self-regulation traffic signal tools were utilized across many sessions, and included in multiple contexts. It may be that this approach facilitated participant learning and acceptance of those tools, and consequently greater generalization (and thus perceived helpfulness) in the home environment.

Lessons Learned for Practice

Taken together our findings suggest that implementing a sibling-focused preventive intervention as a afterschool program is a feasible approach, although future results will indicate if the program is effective in promoting family protective factors and improving sibling relationship quality. The after-school nature of the program minimizes the impact on classroom time often seen in school-based interventions, but takes advantage of the centrality and non-stigmatizing context of the school for families. Eligible families enrolled at a high rate compared to other family programs; and family members attended at a high rate and were highly engaged in the program. Multiple reminders about upcoming afterschool and family fun nights were critical to achieving good attendance. Group Leaders can do this, but we found it works best to provide administrative support for scheduling and reminders. Although the requirements for parent involvement were appropriate, there appears to be room to enhance the utility of specific tools included in the curriculum.

The curriculum and training process was structured in a way to ensure high fidelity across our trained GLs and across diverse school environments. There is room for improvement in training and supervision processes. First, we recommend more training and guidance for managing child problem behaviors in sibling groups. We noted that children seemed less well-behaved in the sibling as compared to classroom context. The sibling context can be emotionally powerful, and siblings have entrenched behavior patterns that can be difficult to manage. Second, because group leaders tend to rate their own fidelity very high with little variability, we recommend providing more guidance and early feedback to group leaders about how to accurately rate the fidelity of each session.

School administrators reacted positively to the implementation of the program, and documentation of positive outcomes of the program may further enhance attractiveness of the program to schools. Importantly, this study documents that a sibling-relationship focus is a feasible approach with potential for high-quality implementation and substantial penetration. Given the high levels of sibling conflict and violence and the critical influence of siblings on each other's development, such documentation of feasibility is important in

itself. In a future report, we will assess whether the *SAS* program is efficacious as well as feasible.

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Biographies

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Mark is a faculty member in the Prevention Research Center at Penn State University. His research has focused on family relationships, including sibling, parent-child, and coparenting relations. He has explored questions relating to the ways in which siblings may find their own niches (i.e., become differentiated). This work has examined the ways that parent-child relations influence sibling relationships. His prevention research includes developing and testing a program to enhance coparenting relations, and developing a new model for supporting the health of mothers. The oldest of four children, he has three children of his own, ranging in age from 6 to 12, which allows Mark to closely observe the triangles and coalitions that come and go among siblings.

Kari-Lyn Sakuma, Ph.D., MPH

Kari-Lyn is a Research Associate in the Prevention Research Center at Penn State University. She has written and developed numerous prevention curricula including on smoking and alcohol prevention for adolescents in California, Hawaii, and China, and obesity prevention among multi-ethnic youth. Also the oldest of four children, Kari-Lyn has intimate knowledge of sibling feuds and alliances.

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Michelle is a Research Associate in the Prevention Research Center who received her Ph.D. in Human Development and Family Studies at Penn State. She has focused on prevention program evaluation, work-family issues, and family relationships. The oldest of four, Michelle has two children—a 15-year-old and an 8-year-old—and has observed that even a large age difference does not prevent sibling rivalry.

Susan McHale, Ph.D.

Susan is a professor in the Department of Human Development and Family Studies and the Director of the Social Science Research Institute and Children, Youth, and Families Consortium. She has studied siblings and families, including why two children from the same family are often different from each other and sibling influences on development and adjustment in childhood and adolescence. She is the second born of four children, and has two children in college, a daughter and a son.

Highlights

- Focusing on the sibling relationship is a viable prevention approach for targeting prosocial and antisocial behaviors.
- Family engagement was high, as indicated by enrollment and participation as well as reports of participant engagement in sessions
- The Siblings Are Special Curriculum can be implemented with high fidelity.

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Figure 1.
Conceptual model of pathways from sibling conflict to adjustment problems and risk factors for antisocial behavior and substance use

Figure 2.
Intervention theory

Table 1

Measures

Measure	Source	Target	Sample Items	Answer Choices	Number of Items	Alpha	ICC
Engagement	Observer	Sibling	"Were the siblings engaged in the discussions and activities?"	1=Resistant to 5=Very enthusiastic*	4	0.91	
	Parents	Sibling	"Did your children enjoy the SAS program?"	1=Not at all to 5=Very much	1	na	
	School Administrators	Sibling	"What type of feedback have you heard about the SAS after school program from students?"	1=negative to 5=positive	1	na	
	Group leaders- post session	Sibling	"Were the siblings engaged in the discussions and activities?"	1=Resistant to 5=Very enthusiastic	5	0.96	0.74
Collusion	Group Leader-post session	Parent	"Were the parents engaged in the discussions?"	1=Resistant to 5=Very enthusiastic*	2	0.86	
	Group Leader-post program	Sibling	"How often did the children seem to team up against you, the leaders, during the after school sessions?"	1=Almost never to 5=Almost always	5	na	
Implementation Quality	Group Leader-post program	GL	"How well did training prepare you to deliver the curriculum as written?"	1=Not at all/Poor to 5=Extremely well/Excellent	8	0.91	
	Group Leader-post program	GL	"How well did you and your partner collaborate with each other?"	1=Not at all/Poor to 5=Extremely well/Excellent	5	0.94	0.40
	School Administrators	GL	"In terms of their professional and respectful conduct toward you, school staff, families, and students, how would you rate the GLs?"	1=Not at all/Poor to 5=Extremely well/Excellent	5	0.89	
Program Fidelity	Observer	GL	"Did the GLs present the material clearly?"	1=Not clear to 5=Extremely clear*	5	0.78	
	Group Leader-post session	Gls	"How clearly did you present the exercises so they were easy to follow by the siblings?"	1=Not clear to 5=Extremely clear*	5	0.80	0.00
	Group Leader-post program	GLs	"How well did you deliver, as written, the after school sessions/family nights?"	1=Not at all to 5=Very much	5	0.64	0.04
Perceived Program Impacts	Group Leaders-post program	Sibling	"Did SAS have a positive impact on the siblings' relationship?"	1=Not at all to 5=Very much	4	0.91	0.75
	Parents	Sibling	"How helpful has this tool been to your family?"	1=Not at all to 5=Very much	4	.81-.89	
	Parents	Program	"How informative did you find the Family Fun Night?"	1=Not at all to 5=Extremely	3	.82-.94	

* In cases where the scale included items with different answer ranges, ratings were transformed to a 20-point scale.

Table 2

Ratings of program dimensions by group leaders (GL), observers (OB), mothers (M), fathers (F), and school administrators (SA)

	<i>M</i>	<i>SD</i>	Possible Range	Actual Range
<u>Program Engagement</u>				
Sibling engagement (OB)	13.7	2.3	4.75–20	9.1 – 16.4
Sibling engagement (GL)	16.0	1.9	4.60–20	12.1 – 18.5
Sibling collusion (GL)	1.7	0.5	1–5	1 – 4.4
Parent engagement (GL)	4.0	0.5	1–5	2.9 – 5
Sibling enjoyment (M)	4.4	0.9	1–5	1 – 5
Sibling enjoyment (F)	4.5	0.7	1–5	2 – 5
Child reactions to SAS (SA)	4.9	0.3	1–5	4 – 5
<u>Program Implementation</u>				
Training and supervision (GL)	3.6	0.6	1–5	2.5 – 4.6
Teamwork (GL)	4.2	0.8	1–5	2.4 – 5
Parent satisfaction (M) *	3.1	0.4	1–5	2 – 4
Parent satisfaction (F) *	3.0	0.3	1–5	2 – 4
Quality of program delivery (SA)	4.5	0.7	1–5	3.3 – 5
<u>Program Fidelity</u>				
Afterschool sessions (OB)	17.1	1.5	4.60–20	12.6 – 18.9
Afterschool sessions (GL)	19.0	0.8	4.60–20	17.3 – 20.0
Overall program (GL)	4.6	0.3	1–5	3.8 – 5.0
<u>Perceived Program Effectiveness</u>				
Program impact on siblings (GL)	3.9	0.6	1–5	2.8 – 5.0
Utility of program tools				
Red light (M)	3.2	1.0	1–5	1 – 5
Red light (F)	2.8	0.7	1–5	1.3 – 4.3
Yellow light (M)	3.3	0.9	1–5	1 – 5
Yellow light (F)	2.9	0.8	1–5	1.3–4.8
Feelings dictionary (M)	2.6	1.2	1–5	1 – 5
Feelings dictionary (F)	2.1	0.8	1–5	1 – 5
Feelings thermometer (M)	2.4	1.0	1–5	1 – 4.5
Feelings thermometer (F)	2.1	0.8	1–5	1 – 4
Talking stick (M)	2.6	1.3	1–5	1 – 5
Talking stick (F)	2.3	1.1	1–5	1 – 5
Compliments (M)	3.7	1.0	1–5	1 – 5
Compliments (F)	3.4	0.9	1–5	1.8 – 5
Informative FFN (M)	4.1	0.8	1–5	2 – 5
Informative FFN (F)	3.8	0.9	1–5	2 – 5

Note:

* Scored on a 5-point scale where 1 = too little, 3 = just right and 5 = too much