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A Family-Based Social Skill Intervention

for Managing Sibling Conflict

by

Stephanie C. Babbitt

A dissertation

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy in the Department of Psychology

Idaho State University

Summer 2018

To the Graduate Faculty:

      The members of the committee appointed to examine the dissertation of STEPHANIE C. BABBITT find it satisfactory and recommend that it be accepted.

                               Mark Roberts, Ph.D.
                               Major Advisor

                               Maria Wong, Ph.D.
                               Committee Member

                               Steven Lawyer, Ph.D.
                               Committee Member

                               Robert Rieske, Ph.D.
                               Committee Member

                               Bryan Gee, PhD, MEd, OTR/L, BCP
                               Graduate Faculty Representative

Human Subjects Committee Approval Page

January 20, 2016

Stephanie Babbitt
Psychology
MS 8112

RE: regarding study number IRB-FY2016-152: A Randomized Controlled Trial Comparing a Skill Building Approach with Standard Treatments for Managing Sibling Aggression

Dear Ms. Babbitt:

Thank you for your responses from a full-board review for your study listed above. These responses qualify for expedited review under OHRP regulations. This letter is to confirm that I have approved your study.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

You may conduct your study as described in your application effective immediately. The study is subject to renewal on or before Jan 19, 2017, unless closed before that date.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Tom Bailey (208-282-2179;   email humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

Human Subjects Committee Re-Approval Page

November 9, 2016

Stephanie Babbitt
Psychology

RE: study number IRB-FY2016-152: A Randomized Controlled Trial Comparing a Skill Building Approach with Standard Treatments for Managing Sibling Aggression

Ms. Babbitt:

I have reviewed your application for revision of the study listed above. The requested revision involves : Proposing to drop the control condition of my study due to recruitment issues we have been experiencing. We have also lowered the desired sample size from 20 families to 10 families. These changes were approved by my committee on 10/31/16. I have attached the proposed changes to the eligibility and treatment consent forms. For the treatment consent form, we added a paragraph about using data gathered during the "follow up" sessions, if necessary: Excerpt
Follow-up Sessions

If follow up services are indicated, we ask that parents collect Behavior Record Card data tracking noncompliance and/or sibling aggression throughout the follow up period. These data will help us determine the effectiveness of follow up procedures to meet treatment goals. These data are part of our research into the Family Version of Sibling Conflict Resolution Skill Training. Follow up procedures are tailored to the family's needs at the conclusion of the research protocol. As with all recommendations given to any parents' participation in the ISU Psychology Clinic, you have the right to accept or reject any recommendations and the right to withdraw any time without any penalty."

The eligibility consent form document changed such that "random assignment" has been removed throughout the document. Additionally the purpose of the study changed to: "The purpose of the program is to teach children to resolve common sibling conflicts. We will evaluate if: 1) the children learned these skills; 2) the children's fighting is reduced".

You are granted permission to conduct your study as revised effective immediately. The date for renewal remains unchanged at 1-19-2017, unless closed before that date.

Please note that any further changes to the study must be promptly reported and approved. Contact Tom Bailey (208-828-2179; email humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIP
Human Subjects Chair

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A Family-Based Social Skill Intervention for Managing Sibling Conflict

Dissertation Abstract--Idaho State University (2018)

Sibling aggression is a common referral for clinical psychologists, yet little is known about best practices regarding its treatment. Standard treatments for sibling aggression presume a motivational deficit, and therefore, aim to restructure the environmental contingencies (e.g., timeout or token economies) to enhance sibling motivation to inhibit aggression. However, a subset of aggressive children may be insensitive to motivational treatment strategies. Treatment failure for these children may be partially explained by a limited set of sibling problem-solving abilities. Specifically, some children may resort to aggressive reactions to routine sibling conflict since they lack skillful alternatives. In contrast to motivational approaches, skill-building treatments focus on expanding the child's repertoire of alternative, pro-social reactions to sibling conflict. The current project was designed to evaluate an uncontrolled clinical trial of a new skill building approach to decrease sibling aggression, referred to as the SCRST-FV (Sibling Conflict Resolution Skill Training – Family Version). Following a two-week baseline measurement, five families with aggressive, skill-deficit siblings completed the five-week SCRST-FV protocol. Baseline measures included evaluations of sibling skills to standardized sibling conflicts presented in an extended, interaction role-play test (i.e., The Sibling Conflict Resolution Scale-III or SCRS-III), as well as daily counts of aggressive interactions recorded by parents on a Behavior Record Card in the home. Treatment consisted of five clinic sessions targeting common sibling conflicts and skillful alternatives to physical fighting. Siblings role-played the targeted skills and parents practiced detecting conflicts, reinforcing skills, and prompting skill use when needed. Parents reinforced skills and helped the children when conflicts were not adequately

resolved at home. Upon completion of the five-week intervention, all baseline measures were repeated. As predicted, siblings significantly enhanced their repertoire of social skills from pre- to-post intervention as measured by the SCRS-III, replicating and extending prior research. Siblings also displayed significant decreases in the frequency of aggression from pre- to-post intervention, suggesting that a skill building approach may be a sufficient treatment. Several methodological limitations, however, limit the replicability and generalization of outcomes.

Key Words: Sibling Conflict, Aggression, Skill-Building Intervention

Introduction

The purpose of the introduction is to provide a brief overview of three topics: 1) sibling conflict; 2) available measures for assessing sibling conflict; and 3) known interventions for aggressive siblings. Additionally, the rationale for the current project and relevant hypotheses are provided. For a more comprehensive review of the literature on sibling conflict, please see Babbitt (2015) or Grimes (2013). The originally proposed project was designed to extend the existing literature by conducting a randomized clinical trial to reduce sibling aggression, comparing a skill building approach to a traditional parent mediated motivational program. Given a lack of qualified referrals, a revised project was approved by the dissertation committee to evaluate an uncontrolled, clinical trial with aggressive, skill-deficit referred siblings in the 4.0 – 11.9 year age range.

Sibling Conflict: A Brief Review

Normal sibling conflict is expected to develop after the birth of a second child as the maternal attention shifts to the youngest sibling (Vandell, 1987). Conflict among siblings emerges as the younger sibling matures and sibling interactions increase in frequency (Abramovitch, Corter, & Lando, 1979; Lawson & Ingleby, 1974). Young children display high rates of sibling conflict. Indeed, children between the ages of 18-24 months can be expected to experience eight, high-intensity conflict episodes per hour on average during free play conditions in the home setting (Dunn & Munn, 1985). However, normal sibling conflict decreases in frequency and intensity as the siblings mature (i.e., one to two conflict episodes per hour in middle childhood) (Dunn 1988; Dunn & Munn, 1985; McHale & Gamble, 1989).

Although conflict is a common occurrence among young children, siblings are also a primary source of companionship (Buhrmeister & Furman, 1987) and social learning (Dunn &

Herrera, 1997; Shantz & Hobart, 1989). In some cases, younger siblings can acquire routine

social skills from their older sibling. For instance, younger siblings can adopt more sophisticated

conflict resolution skills, such as verbal justification and perspective taking, from the models

provided by their older sibling (Dunn & Herrera, 1997; Shantz & Hobart, 1989). Thus, younger

children can actually increase their repertoire of social skills by engaging in conflict resolution

with an older sibling.

Unfortunately, sibling conflict can escalate to a clinical problem and become a common

referral for clinical psychologists. High rates of sibling conflict have been associated with

negative outcomes in later life, such as bullying, antisocial behavior, and substance abuse (Ensor,

Marks, Jacobs, & Hughes, 2010; Low, Short, & Snyder, 2012). Additionally, internalizing

disorders, such as anxiety and depression, have also been linked to high rates of sibling conflict

in middle childhood (Kim, McHale, Crouter & Osgood, 2007; Stocker, Burwell, & Briggs,

2002). Patterson (1984, p. 184) has gone so far as to hypothesize that poorly monitored and

ineptly disciplined siblings are "…the key pathogens in the deviancy process". Therefore,

clinical psychologists need to assess and intervene when high frequency sibling conflict persists

during the pre-school and middle childhood periods (i.e., 4 to 12 year olds).

Assessment of Sibling Conflict

Many measures and methods exist for assessing sibling conflict, including self-report,

informant report, and observational measurements. Each method will be briefly reviewed.

Self-Report and Informant Report Measures for Assessing Sibling Conflict.

Self-report measures used to assess sibling conflict and conflict resolution strategies

include structured interviews and questionnaires completed by children. These measures are low

in cost and aim to directly sample the beliefs of children. Rose and Ascher (1999) created a

structured interview designed to measure children's conflict resolution skills with peers. More recently, researchers have adapted the original structured interview put forth by Rose and Ascher (1999) to evaluate sibling conflict resolution skills (McGuire et al., 2000; Ross, Siddiqui, Ram, & Ward, 2004; Wilson, Smith, Ross, & Ross, 2004).

Questionnaires provide an alternative strategy for assessing informant beliefs about the sibling relationship. Examples include: the Sibling Relationship Questionnaire (SRQ) developed by Furman and Buhrmester (1985), the Brother-Sister Questionnaire (BSQ; Graham-Berman, 1994), the Sibling Relationship Inventory (SRI; Stocker & McHale, 1992), the Sibling Behavior and Feelings Questionnaire (SBFQ; Mendelson, Aboud, & Lanthier, 1994), and the Sibling Inventory of Behavior (SIB) developed by Hetherington, Henderson, and Reiss (1999). Many of these questionnaires have both self-report (for older dyads; i.e., 8.0 years and above) and parent informant versions (for younger dyads; e.g., SRQ, BSQ, SIB). These measures sample both positive and negative aspects of sibling interactions, such as empathy (BSQ, SIB), warmth (SRQ), coercion (BSQ), and conflict (SBFQ, SRQ). For a comprehensive overview of these measures, please see Grimes (2013) or Babbitt (2015).

Self-report measures of sibling conflict have both strengths and weaknesses. Both structured interviews and questionnaires reliably sample the beliefs of the children or parent informants. Unfortunately, research on these measures is limited and the psychometric properties of these tools have not always been investigated. Specifically, the lack of treatment validity for all of the instruments listed above is problematic (i.e., does the measurement improve the treating clinician's intervention decisions?). Also, many self-report assessment tools can only be used with older dyads (usually over the age of 8), given the literacy demands of the measure. Therefore, while self-report measures are essential for furthering our understanding of child

beliefs about the sibling relationship, other forms of assessment are needed to provide an empirical basis for clinical decision-making. Specifically, clinicians need to decide whether to intervene or not, and if intervention is indicated, guidance on the focus of that intervention.

Nevertheless, informant-completed rating scales are the most common assessments tools for measuring sibling conflict. These scales require parents to rate their children's behavior and perceived social skills with siblings and/or peers. Four different rating scales are available: the Home and Community Social Behavior Scales (HCSBS; Merrell & Caldarella, 1999), the Parental Expectations and Perceptions of Sibling Relationship Questionnaire (PEP-SRQ; Kramer & Baron, 1995), the Sibling Conflict Questionnaire (SCQ; Reed, 1992), and the Sibling Social Behavior Scale (SSBS; Graham-Bermann & Cutler, 1994). In general, these instruments possess adequate psychometric properties (Howe, Karos, & Aquan-Assee, 2011; Kennedy & Kramer, 2008; Kramer & Baron, 2011; Kramer & Rady, 1997). The HCSBS and PEP-SRQ have been shown to be sensitive to treatment. For example, Thomas and Roberts (2009) found that children were rated as more socially competent on the HCSBS after sibling conflict resolution skills training, compared to children in a wait-list control group. Additionally, Grimes (2013) found improved HCSBS following a similar sibling conflict resolution skill-building program. Recently, Babbitt (2015) reported that younger siblings were rated as significantly more socially competent by their parents following a parent training protocol for managing sibling conflict, while older siblings did not appear to improve. A multi-project report by Nakaha, Grimes, Nadler, and Roberts (2016) failed to find correspondence between the SCQ and overt sibling interaction measured in clinic analogs. The HCSBS, however, was sensitive to improved sibling conflict resolution skill repertoires, but in contrast to Babbitt (2015), only for older members of the sibling dyad (i.e., in the 8-12 year range). An important qualifying feature of parent report

measures in the sibling literature is that the instruments are not always designed to assess *sibling* conflict resolution skills, but measure more general social acceptance and competence with peers instead (i.e., HCSBS).

In summary, parent-report measures are a common form of assessment used to evaluate sibling relationships. These measurement tools are especially helpful in attempts to understand relationship quality in younger dyads who are too immature to use self-report measures. Similar to child self-reports, however, outcomes are limited to parent's beliefs about their children, which are subjective, and as noted above, are poor proxies for overt sibling interaction and repertoire skills.

Observational Methods for Assessing Sibling Conflict.

A limited number of observational methods for assessing sibling conflict and conflict resolution skills exist. Unfortunately, only a subset of these measurements has exhibited acceptable psychometric properties (Blackford, 1993; Williams, 1990; Wood, Michelson, & Flynn, 1978; Thomas, 2004). Only observational methods relevant to the proposed project will be reviewed here. For more information on observational coding systems for sibling conflict or sibling conflict resolution, please see Grimes (2013), Babbitt (2015), or Nakaha et al. (2016).

Behavior Record Cards. Behavior Record Cards, or BRCs, allow professionals to track specific overt behaviors (e.g., sibling aggression or sibling skill use) in contexts outside the laboratory/clinic. For example, Nadler and Roberts (2013) trained parents to code episodes of child aggression and noncompliance in the home and the community. Parents were asked to track these behaviors over a period of two weeks. Parents displayed adequate accuracy when compared to a professional observer in the home. Additionally, the BRC system yielded good reliability (odd-day even-day $r > .70$ for all codes) and moderate concurrent criterion validity

(Nadler & Roberts, 2013). Babbitt (2015) adapted the BRC system introduced by Nadler and Roberts to track independent social skill use by target siblings, as well as parent attempts to help siblings resolve conflicts in the home. While the psychometric properties of BRC counts of sibling skill use and parent prompts to facilitate skills (i.e., "Help") are unknown, results from Babbitt (2015) suggested that parents were willing and able to track sibling skill use in the home, as well as their own attempts to help siblings implement conflict resolution strategies. Nakaha et al. (2016) proposed that BRC frequency counts of sibling aggression in the home be used to identify excessively aggressive dyads (i.e., 1.2 fights per day or higher) and as a treatment outcome measurement. Shaw (2010) defined a treatment goal for middle childhood referrals based on BRC data to be 2.0 or fewer combined episodes of aggression plus noncompliance per week over a 2-week period. Taken together, BRCs appear to provide important information about clinically relevant behaviors displayed outside the professional setting.

   Sibling Play Analog. The Sibling Play Analog (SPA; Nakaha, 2007; 2010; summarized in Nakaha et al., 2016) is a 20-minute play observation in a laboratory setting. The SPA was designed to measure the quality of preschool and middle childhood sibling interactions during unstructured free play. During the observation siblings are asked play with pre-selected toys while the parent is "busy". The presence of a parent in the room during SPA observations varies depending on the age of the sibling dyad. Dyads at least 7 years old are instructed to play without the presence of an adult, while younger dyads, ages 2 to 6 require parental supervision. The SPA is coded via partial-interval sampling in 20-second intervals for the presence or absence of five codes: Verbal Harassment, Angry-Yelling, Physical Antagonism, Justification, and Cooperative-Play. Research with the SPA suggests that it is sensitive to the expected developmental advancements in interaction quality of normally developing siblings. Moreover, performance on

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the SPA has been shown to be significantly correlated with the SCRS-III average item scores (Nakaha et al., 2016). Nakaha et al. suggests that clinicians use the SPA for identifying deviant interactions between middle childhood dyads. Based on local norms, dyads between 7 and 11.9 years should display virtually zero instances of aggression combined with high levels of cooperative play (approximately 40%) maintained by justifications (approximately 20%) and only minor levels of verbal harassment (approximately 10%).

   Sibling Conflict Resolution Scale-III. The Sibling Conflict Resolution Scale-III (SCRS-III; Thomas & Roberts, 2009; Grimes, 2012; reported in Nakaha et al., 2016) is a 16-item behavior analog designed to gauge a child's conflict resolution repertoire. Each item is based on content validity work reported by Roberts, Arnold, and Mangum (1992) and requires the child to solve routine sibling problems. A more detailed account of the SCRS-III is provided in the Method Section below. The SCRS-III yields data that have been shown to be internally consistent, reliable, sensitive to treatment, and moderately predictive of sibling play quality. Grimes (2012) found that the SCRS-III yields reliable average item scores across two parallel forms. The SCRS-III also possesses clinical utility for the decision to intervene with skill building versus a parent mediated motivational approach for addressing sibling aggression. Given the standard error of measurement (0.2 SCRS-III units), Nakaha et al. (2016) recommended that children with SCRS-III average item scores of 3.8 or less would be good candidates for skill building interventions.   An SCRS-III score of 4.0 implies consistent use of context appropriate verbal solutions to resolve sibling conflicts. Consequently, a child with an SCRS-III score of 3.8 or less may be fighting with his/her siblings as a result of an impoverished repertoire of skills, rather than a motivational problem. In contrast, children with SCRS-III scores above 4.2 consistently use appropriate verbal skills in the SCRS-III testing environment.

Improving such children's repertoire is unlikely, given three intervention studies to date (Thomas & Roberts, 2009; Nakaha et al. 2005; Babbitt, 2015). In each of those projects, siblings exposed to standardized skill building averaged at best an SCRS-III score of 4.2 post training. Note that the maximum SCRS-III average item score is 5.0. Children in the 3.8 to 4.2 range, fall in a range of uncertainty. Such children can improve their repertoires, as shown by Babbitt's older sibling cohort, which improved significantly from an average of 3.9 to 4.2 post intervention.

Observational measures of sibling conflict and aggression add objective information about sibling functions, independent of the general beliefs of either a parent informant or school aged child. However, these benefits come with noticeable limitations, as current observational measures like the SCRS-III require extensive training to administer, are costly in terms of time, and require the presence of more than one professional.

Sibling Conflict Intervention

There are numerous interventions for sibling conflict, although fewer exist specifically for reducing physical aggression among siblings (Kramer, 2004; Vandell & Bailey, 1992). Broadly speaking, available interventions for treating sibling aggression include skill building approaches and motivational approaches.

Motivational Approaches. Motivational approaches focus on managing sibling aggression through operant principles. These approaches assume the child possesses a motivational deficit (as opposed to a skill deficit), and therefore, aim to restructure the environment to encourage the child to inhibit aggression. Only minor efforts are engaged to encourage the use of alternatives to aggression (e.g., brief parent-child discussions about options to physical aggression following timeout or token fines). Parent Management Training (PMT) is the primary example of a motivational approach for managing disruptive behavior in early

childhood (e.g., Eyberg & Robinson, 1982; McMahon & Forehand, 2003; Webster-Stratton & Reid, 2007) and middle childhood (e.g., Kazdin, 2005; Patterson, Reid, & Eddy, 2002). In PMT, parents are instructed to reinforce prosocial behaviors and punish misbehavior (e.g., with token fines and/or timeout).

Reviews of PMT suggest that such interventions have proven to be an effective therapeutic strategy for decreasing general childhood disruption (Chambles & Ollendick, 2001; Eyberg et al., 2008) and managing sibling aggression in particular (O'Learly, O'Leary, & Becker, 1967). For example, Jones, Sloan, and Roberts (1992) demonstrated the benefits of a timeout routine for decreasing sibling aggression in pre-school aged siblings. This study utilized an alternating treatment design comparing "don't" instructions with immediate timeout for aggressive behavior. The results suggest that timeout effectively reduced fighting among preschool siblings, whereas instructing children to "Stop Fighting" did not. Although children ceased aggression upon the maternal instruction to do so, aggression frequencies remained stable or actually increased under "Stop Fighting" conditions for some participants.

Standard PMT techniques do not systematically target replacement skills for sibling aggression. It is assumed that siblings already possess alternative skills to aggression, which may not be the case. Of concern with PMT is that children may simply avoid fines and/or timeout by avoiding one another, rather than learning to resolve problems through discussion, compromise, and/or acceptance. So, although PMT has been applied successfully in managing sibling conflict, some families may need additional interventions designed to directly teach replacement skills for aggression. In order to increase children's repertoire of skills, some early PMT strategies have investigated a social skills training component. For instance, Olson and Roberts (1987) randomly assigned clinic-referred aggressive siblings in the 2 to 10 year age

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range to one of three conditions: Social Skills (SS), Timeout (TO), or Combination (COMBO). Families attended four treatment sessions. Parents in the TO condition were trained with a combination of videotape and role-play to recognize and implement a timeout routine when their children were aggressive. Children in the SS condition were trained via videotaped modeling and role-playing to use a variety of skillful alternatives to aggression, such as: ignoring, using appropriate verbal assertions, requesting adult assistance, sharing, and negotiation. Children and parents in the COMBO condition were exposed to both timeout and skills. Overall, parents in the TO and COMBO conditions yielded the least amount of child aggression on BRCs by treatment blocks 2 and 3, while parents in the SS only condition yielded continued high frequencies of child aggression (over 3 per day) across the three treatment blocks. These results suggest that including timeout, or a similar form of discipline for older children (e.g., token fines), might be necessary to block the reinforcing effects of coercion (Olson & Roberts, 1987). Nevertheless, these results must be interpreted with caution as this study lacked a no-treatment control group and included 2-3 year olds, for whom we have no evidence that we can induce more complex conflict resolution skills. Moreover, researchers did not assess the children's social skill repertoire at pre- or post-intervention, since this project pre-dated the evolution of the SCRS-III. It is, therefore, unknown whether children in the study, particularly those children assigned to the SS condition, were actually in need of skill building and/or developmentally ready to profit from the SS training conditions. It is presumed that some in the SS condition were skillful, but opted for aggression given it historical reinforcement. Consequently, the skill building protocol may have been both unnecessary and/or ineffective.

A different methodology was used by Shaw (2010) to address the same research question with middle childhood referrals. Eligible families were randomly assigned to two different

orders of the intervention components, all of which were designed to reduce sibling aggression and one of which (Social Skills) was designed to encourage replacement skills. Unlike Olson and Roberts (1987), Shaw restricted her sample to the middle childhood age range (7-12 years), thereby targeting children who have proven to be sensitive to skill building on the SCRS-III. Moreover, baseline measures on the SCRS-III indicated a need for skill building in most participating children. Treatment components were introduced in two orders: Standard Order (1. Token Reinforcement/Fine; 2. Timeout; and 3. Social Skills) versus a Control Order (1. Social Skills; 2. Token Reinforcement/Fine; and 3. Timeout). Both orders were associated with decreasing BRC aggression rates, with no significant differences between the two orders. SCRS-III data were obtained pre-treatment to provide a baseline, but not as an eligibility function, nor as an outcome measurement. Consequently, the role of the Social Skill component to decreased aggression could not be adequately determined.

Skill Building Approaches. Skill building approaches are considered a front-line prevention program for aggressive school-aged children (Lochman et al., 2015). The "Coping Power" intervention developed by Lochman and Wells (1996) at the University of Alabama is well recognized as the gold standard prevention program for at-risk youth in middle childhood. The failure of peer interaction skills to emerge has long been hypothesized to underlie aggressive and antisocial behavior in pre-adolescent children, setting the stage for future conduct problems in adolescence. In other words, a subset of aggressive children may lack adequate problem-solving abilities and, thus, resort to aggression as the only tool in their repertoire. See Patterson (1982) for the theory and correlational support for developmental pathways to adolescent conduct disorder. In general, current skill-building interventions are designed to   improve children's social skills in order to decrease current or future sibling or peer aggression.

Kramer and Radey (1997) examined how social skill training impacted sibling dyadic interactions in the children of community volunteers (i.e., non-clinic referred). Participants were taught social skills, such as how to initiate play, accept and decline an invitation, cope with anger in others, and resolve conflicts. Kramer and Radey evaluated the delivery of the social skills training by manipulating the training method: direct face-to-face training, through books, videotapes, or group discussion. The results suggested that children who received face-to-face social skills training were perceived as improved in levels of warmth and interactions with their siblings, while children in the videotape, books, or discussion conditions were not. This suggests that overt practicing is an important component of social skills interventions.

Thomas and Roberts (2009) examined methods to assess and intervene with sibling conflict. The SCRS-III was used to evaluate sibling conflict resolution skills before and after intervention, relative to a no-treatment control group. In the experimental condition siblings participated in social-skill training targeting verbal reasoning, assertiveness, and acceptance skills. The results indicated children in the sibling conflict resolution skills training condition significantly improved in their skills on the SCRS-III and on parent's perception of social functioning at home (HCSBS, referenced above). In contrast, children in the measurement/wait-list control condition did not improve on either measurement. Similarly, Grimes (2013; reported in Nakaha et al., 2016) demonstrated that sibling conflict resolution skill training (SCRST) was associated with an increase in children's repertoire of skills in a laboratory setting. Families attended a 1-hour social skills training each week for five weeks. Siblings between the ages of 5.0 and 11.9 demonstrated significant differences from pre- to post-training in conflict resolution skills. This finding did not generalize, however, to the home or to SPA laboratory settings.

Recently, Babbitt (2015) modified the SCRST training program (Grimes, 2013; Nakaha et al., 2016) into a parent training protocol to promote setting generalizability. Eight families with at least two siblings between the ages of 4.0 and 11.9 years completed the Sibling Conflict Resolution Skills Training-Parent Version (SCRST-PV) protocol. Eligible participants recruited from the community completed the pre-intervention assessments, including: the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), SPA, and SCRS-III. At least one target sibling scored below 3.8 on the SCRS-III at baseline. Parents then completed the 5-week SCRST-PV protocol. Unlike the standard SCRST program, children were not present for the five treatment sessions of the Parent Version of SCRST. The focus was on teaching parents to recognize routine sibling conflicts, optional skillful responses to those conflicts, how to positively reinforce siblings for skillful responses, and how to prompt children when help was needed. As noted above, BRCs were used to track independent skill use by the target siblings and parental attempts to "help" the siblings get along. BRCs were publicly displayed in the home (stickers signified skill use, check marks indicated help given). Stickers were exchanged for agreed upon activity and material reinforcers at the end of each week. The post-intervention measurements were administered upon completion of the SCRST-PV, repeating all pre-intervention measurements other than the CBCL. Children independently demonstrated the skills at home, but sometimes required prompts (help). Both younger and older siblings significantly improved their performance on SCRS-III after their parent completed the SCRST-PV, signifying that sibling's social skill repertoires were increased, despite the absence of direct training by the therapist. However, there was no control group in Babbitt's project, nor did participants display evidence of pre-intervention aggression in the home on BRCs. Nevertheless, Babbitt integrated the parent into an active role for promoting and reinforcing sibling skill use in the home, a strategy that has

moved the field forward in addressing externalizing disorders of pre-adolescent children since the 1960s.

Summary of Literature Review

Current interventions for decreasing sibling aggression include both motivational approaches, such as PMT, and social skills training. Both approaches have been demonstrated to be effective treatments for decreasing sibling aggression. However, these different interventions are hypothesized to address two distinctly different socialization failures. With children who lack an adequate repertoire of alternative conflict resolution skills, gaining that repertoire may be sufficient to reduce sibling aggression. On the other hand, children with a lengthy history of successfully managing sibling conflicts with coercion may persist in using aggression, despite an adequate repertoire of skills. Skills require cognitive effort and may fail. Indeed, accepting what cannot be changed is one of the key skills introduced in current sibling conflict resolution skill building (Nakaha et al., 2016). Finally, if Patterson's developmental models are applicable to a specific middle childhood referral, both skill deficits and coercion may present simultaneously.

Project Overview

Aggressive, skill-deficit children were to be randomly assigned to either a skill building condition (SCRST-FV) or a parent management condition (PMMP). Note the use of the abbreviation, FV, which will be used hereafter, standing for the "Family Version" of SCRST. All children were evaluated for changes in home aggression frequency (BRC), changes in Sibling Play Analog (SPA), and changes on the SCRS-III. Parents completed general ratings of child misconduct on the Child Behavior Checklist. Parent ratings were also obtained post intervention to evaluate parent appraisals of intervention component effectiveness and the degree of implementation difficulty. Follow-up clinic procedures, while not part of the formal project,

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were offered to supplement the effects of the primary intervention (e.g., offering parent management components to children randomly assigned to the skill building, and vice versa), if treatment goals were not met by the randomly assigned intervention protocol.

Hypotheses

1. Children in the SCRST-FV condition will manifest significantly improved SCRS-III average item scores from pre- to post-intervention, as well as significantly decreased mean daily frequencies of sibling aggression.

2. Children in the PMMP (Parent Mediated Motivational Protocol) conditions will display significantly reduced sibling aggression and noncompliance with adult instructions from pre- to post-intervention on BRC mean daily frequencies. PMMP recipients will not, however, improve their conflict resolution skills from pre- to post-intervention on the SCRS-III. Children in the PMMP conditions will be perceived by parents to possess reduced CBCL Aggression Subscale T-scores.

   - Hypothesis 2, unfortunately, was not evaluated. The PMMP condition had to be eliminated from the dissertation's design as a result of the failure to recruit a sufficient number of eligible families. The dissertation committee approved the discontinuation of the PMMP condition in October 2016.

Method

Participants

The original plan was to recruit approximately 20 **"eligible families"**. To be eligible for the study, each family had to have at least two siblings between the ages of 4.0 and 11.9 years. If more than one sibling dyad from the same family met age criteria, the parent report of the dyad most likely to physically fight was the first selection criterion; the second criteria was the age of the children, giving preference to dyads over 7.0 years; the third selection criteria was the dyad in the closest age proximity to each other. Using these criteria, the two selected children from each family are hereafter referred to as the "target siblings". Both target siblings were required to score a 4.2 or lower on the SCRS-III and at least one of the target siblings displayed a mean daily aggression rate of one standard deviation above the normative mean provided by Nadler and Roberts (2013): for younger members of the dyad that rate was 0.7 aggressive acts per day; for older members of the dyad that rate was 0.6 aggressive acts per day. Note that the dissertation committee originally approved a mean daily aggression rate of 1.0 for project eligibility, which was subsequently reduced with committee approval in reaction to recruitment difficulties. Families were excluded from the study if either sibling met *DSM-5* criteria for Intellectual Disability or Autism Spectrum Disorder, since these special populations might be less responsive to the skill building approaches offered in the project. All other siblings in the home were encouraged to participate in the project's home components (e.g., the parent help and positive reinforcement system) and clinic training sessions, but were not evaluated pre- and post-intervention with the project's four outcome measurements: the SCRS-III, Behavior Record Cards (BRCs), the Sibling Play Analog (SPA), and the Child Behavior Checklist (CBCL).

The family recruitment process included contacting/visiting local agencies about the project, posting announcements in the local newspaper, and one local television appearance. The recruitment process commenced in January 2016 and continued through June 2017.   In October 2016 the dissertation committee was reconvened to consider altering the methodology to accommodate the lack of eligible families willing to participate in the project. The committee agreed to focus the project on an uncontrolled, clinical trial of the SCRST-FV, rather than the planned randomized clinical trial comparing the SCRST-FV to the conventional PMMP protocol. The extensive methodology describing the PMMP protocols during the prospectus meeting has been removed from the Method section below. Only one eligible family had completed the PMMP protocol at the time the dissertation committee agreed to eliminate the PMMP condition from the project.

Recruitment data obtained during the dissertation's duration from January 2016 to August of 2017 were as follows:

Families (n)	Status Assigned
11	Reacted to announcements but never scheduled (variety of reasons)
9	Scheduled for Evaluation 1, but no-showed and were unable/unwilling to reschedule
4	Completed Evaluation 1 and then dropped out
6	Completed Evaluations 1 and 2; found to be ineligible for inclusion
2	Randomly Assigned to PMMP: 1 completed the protocol; the other dropped out after 2 treatment sessions

7   Assigned to SCRST-FV: 5 completed the protocol; 1 dropped out after

Session 1; 1 completed the 5 treatment sessions, but dropped out

without completing the post treatment evaluations

Procedures

Measurements

1. Behavior Record Card (BRC)

Behavior Record Cards (BRCs) were used to track episodes of sibling aggression and

noncompliance with adult instructions for two-week periods both pre- and post-intervention.

During the 5-week SCRST-FV protocol, participating families used the BRCs to count parental

prompts (i.e., "Help") to encourage siblings to use targeted skills when conflicts were not being

resolved, as well as token reinforcement administered for the unprompted use of targeted skills.

BRC training during the evaluation phase of the project was a two-step, standardized

videotaped training procedure (Nadler & Roberts, 2013) designed to help parents detect and

record instances of noncompliance and aggression. Step 1 was a guided practice component,

which was followed by test scenarios (Step 2). BRC Noncompliance Training was performed

first, followed by BRC Aggression Training. After each practice scenario (17 for noncompliance

and 15 for aggression), the parent coded occurrence or nonoccurrence on a sample BRC. The

trainer then discussed the parent's decision, socially reinforced correct decisions, and labeled

why that decision was correct. If the parent made an error, the trainer discussed the reason why

the parent should have coded (or not coded) noncompliance and/or aggression. In Step 2 of BRC

training, parents completed an accuracy test using a videotape that contains new scenarios (20

for noncompliance and 22 for aggression). The appropriate parent response was to make a tally

mark in the relevant column on the BRC per occurrence for each target behavior during the test

scenarios. The trainer did not respond to the parent unless an error was made (either commission or omission). Errors were discussed immediately, accompanied by the reasons for correct coding. If four or more errors were made during the test scenarios, the parent would have been required to repeat the test scenarios until mastery (accuracy at 80% or higher) was demonstrated. This did not occur at any point in the project as all parents successfully passed the testing portion of the BRC training on their first attempt.

The duration of the videotape training and testing was approximately 45 minutes. Children were not informed of the parent home observation procedure. Parents were provided with a BRC for home coding and scheduled for the next evaluation session, which was approximately one week later; a new BRC was provided following the next evaluation session, yielding the second week of BRC data.

2. Sibling Play Analogue (SPA)

The Sibling Play Analog is an observation in a laboratory setting. The targeted sibling dyad was asked to play with pre-selected toys for 20 minutes while their parent was "busy". The presence or absence of two prosocial behaviors (Cooperative Play and Justifications), as well as three coercive behaviors (Verbal Harassment, Angry-Yelling, and Physical Antagonism) were coded during each 20-second interval from video recordings. If at least one of the targeted siblings was over age seven (three of the five completing SCRST-FV families), the children were read the following statement:

"Your mom is going to work in a different room, filling out forms for us. We want to see how you two get along, when you have to wait for your mom. We have some different games and toys you can play with while you wait. See the camera up there? We will

have to videotape you two so we can look at it later and see how you got along while

your mother works. Okay? Understand? Thanks!"

If both of the targeted children were under at seven years (two of the five completing SCRST-FV

families), the parent remained in the room with the children during the 20-minute SPA

observation. Parents were instructed as follows (Nakaha, 2010):

"I want your children to play with the available toys. Have your children play while you

work. Do whatever you would normally do to help them play by themselves, such that

you can complete your adult work. If you finish the work, please continue to "look busy"

and help them play by themselves, as needed. Certainly, don't allow any dangerous or

destructive activities."

Parents then read these specific instructions to the children once the researcher vacated the room:

"I want you to play by yourselves with these toys while I work. I will be busy, so please

play by yourselves. See the camera? The ISU teachers will be videotaping to see how

you get along. Thanks."

Coding of the SPA videotapes used a 20-second partial-interval sampling system to detect the

presence (one or more times) versus the absence of each of the five codes in each interval.

a) Verbal Harassment (VH): threatening talk, negative evaluations, or rude expressions

b) Angry-Yelling (AY): angry in tone, can include crying, and must be sibling directed

c) Physical Antagonism (PA): grab, rude touch, or fight

d) Justification (J): an explanation and/or reason why the sibling should obey a "Do X" or

"Stop Y" instruction; an explanation and /or reason why a sibling instruction was

disobeyed.

e) <u>Cooperative Play (CP)</u>: an interactive sequence of actions by both siblings to perform a

common task or take turns in a structured game

3. The SCRS-III Forms A & B

The SCRS-III is a content valid, extended interaction, behavioral role-play test in which

each sibling is independently exposed to 16 discrete scenarios (Nakaha et al., 2016). Each

scenario is presented by a Narrator and an Actor (who portrays the sibling role). Children have

up to three trials in each scenario to "…show their best behavior…" in response to the presented

conflict. The scenarios in the SCRS-III represent common conflicts for 4.0 to 11.9 year old

European-American children in the home setting. Children are repeatedly given the instruction

to "…show me your best behavior, the way your mom, dad, and teachers want you to act toward

your brother/sister (name)." The purpose is to sample the child's current skill repertoire, rather

than what they might currently do in natural settings. The children are given a score from 1 to 5

for each scenario, where:

1 = physical aggression

2 = negative verbalization

3 = neutral

4 = incomplete verbal solution

5 = sophisticated verbal solution

The child's highest score across the three trials is used to determine his/her total score on

the SCRS-III. The total score is the child's average item score. Note that item administration

ceases if the child scores "5" on any trial or after all three trials have been administered. The

average item score serves as the indicator of the child's current repertoire for resolving routine

sibling conflicts. Children were randomly assigned to SCRS-III Form A or Form B at pre-

intervention. At post-intervention each child completed the alternate form. SCRS-III takes approximately 25 minutes to complete per child. All SCRS-III administrations were videotaped for subsequent scoring. The administration booklets used by the Narrator and Actor are available, but not reproduced here.

4. Child Behavior Checklist (CBCL)

The Child Behavior Checklist (CBCL) is an informant-based questionnaire designed to screen for behavior problems in children and adolescents. The CBCL was completed for each targeted sibling during pre-intervention and post-intervention assessment periods by the primary participating parent. Only the Aggressive Behavior and Rule-Breaking subscales were scored and evaluated.

5. Treatment Acceptability Ratings

During the second post intervention session, parents were provided a voluntary opportunity to complete rating scales designed to sample the their opinions about: 1) the usefulness of each of the five classes of sibling conflict resolution skills; 2) the difficulty of implementing the recommended Help and Reinforce procedures in the home; 3) the usefulness of the Help and Reinforcement procedures in the home. Each item is responded to on a 7-point, bipolar scale designed by Shaw (2010) and adapted for the current project. Parents were asked to consider submitting the completed form to the clinic office staff; no identifying marks were included on the form, insuring anonymity of responses (Shaw 2010). Only one form was collected per family. All five completing SCRST-FV families submitted the form.

Overview of Project Methodology

Participants constituted a clinical sample recruited via public announcements. Participants completed two pre-intervention assessments at the ISU Psychology Clinic, followed by five SCRTS-FV treatment sessions over the course of approximately five weeks, followed by two post intervention assessments. All families were offered follow-up procedures as needed, based on BRC data and parent interest.

Pre-intervention. The following outlines the sequence of assessments performed during the two pre-intervention sessions. Data collected during the two-week baseline period were used to determine if families met inclusion criteria. All participating parents reviewed, discussed, and agreed to the Eligibility Consent Form prior to embarking on the two-week pre-intervention period.

Session 1: Pre-Intervention Eligibility Phase

- Parents completed all standard ISU Psychology Clinic forms (e.g., Application, ISU Psychology Clinic Consent From, and Fee Agreement)
- Eligibility Consent Form
- Clinical interview with parent(s) performed while targeted siblings completed the 20 minute SPA during the same period (if at least one member of the dyad was 7 years or older)
- ALTERNATIVELY: If both siblings were between 4.0 to 6.9 years, the parent remained present in the SPA room with the children; children completed the SPA, while the parent completed CBCLs for both target siblings
- BRC Training for parent
  - Sent Home:

- BRC Training Handout

- BRC for Week 1

Session 2: Pre-Assessment (approximately 1 week after Session 1)

- Reviewed BRC with parent in private

- Parent completed CBCL for both siblings (if not completed during Session 1) while children completed SCRS-III one at a time

- Completed parent interview if time precluded completion during Session 1

- BRC for Week 2

If a family qualified for the study after the two week Pre-intervention Eligibility Phase, they were asked to consider participation in the formal project at the outset of the family's third visit to the clinic. Random assignment to either the SCRST-FV intervention or the control condition (i.e., the age appropriate PMMP intervention) was made prior to the third clinic visit, based on available data. Random assignment procedures were in place from February 2016, until discontinued in October 2016, following committee discussion of the difficulty of recruiting eligible participants. Thereafter, the project offered only the SCRST-FV condition. Note that final eligibility awaited the second week of BRC data from the home, even if both children meet the SCRS-III criteria (i.e., < 4.3). Ineligible families were offered clinic interventions consistent with interview, questionnaire, clinic observations, and BRC data. Note that the clinic evaluation fee was waived for all families who completed the two session, two week evaluation phase of the project. Were ineligible families found to need interventions, they were required to pay standard clinic intervention fees based on the ISU Psychology Clinic's current sliding scale. In contrast, eligible participants were charged the reduced research fee for each intervention session in the protocol (five sessions). Further, those who completed the five-session protocol and the two-

week post-intervention evaluations received a $50 credit toward their accumulated clinic fees, including any follow-up fees. Follow-up sessions were charged at the standard ISU Psychology Clinic rate. Specifically, some children in the SCRST-FV protocol were likely to need motivational procedures (e.g., allowance systems, fines, timeouts), and some children in the PMMP protocol were likely to need sibling conflict resolution skill training. Of the five families completing the SCRST-FV protocol, four of five elected to receive follow-up sessions. The one family that completed the discontinued PMMP protocol also received follow-up sessions.

General Description of the SCRST-FV Intervention

The SCRST-FV protocol is a five week, five session, skill building intervention based on Grimes (2013), Nakaha et al., (2016), and Babbitt (2015). Siblings and their parents were taught a variety of sibling conflict resolution skills in a systematic and graduated fashion across the five sessions. Reinforcement for home use of targeted skills was continuously in effect, along with parent "Help" in resolving conflicts at home when needed.

Each session was led by a primary therapist with the aid of two assistant therapists who served as actors during role-plays. Generally, the actors portrayed the child roles during training sessions, while the therapist portrayed parent roles. Both parents were encouraged to attend with their children. However, at least one parent was required to attend all five intervention sessions with both target siblings.

A token reinforcement system was used during all five SCRST-FV therapy sessions. Children were awarded tokens in the form of a plus mark on a large, dry-erase board for each correct role-play (two tokens) and each correct answer (one token) to therapist questions. Children also received two tokens for each independently displayed conflict resolution skill in the home, detected by the trained parent who awarded a sticker on the BRC for that child under

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the BRC column for that specific skill. Points were accumulated and saved or exchanged for prizes, activity coupons, or money from the Clinic Store.

Each session began with a discussion of the topic, structured by a handout and a behavior record card (BRC). Each handout specified the conflict situations and optional conflict resolution skills a child could use to resolve the conflict. BRCs were introduced during the first session and parents were instructed to track unprompted use of specific SCRS-III skills (i.e., praise plus token reinforcer given) and prompts used following mistakes made by children (i.e., "Help"). At the beginning of subsequent sessions (i.e., two through five), the BRC was reviewed and children were awarded points for independent skill use in the home. A private meeting with the parent was then convened to address any parent concerns and to orient the parent to the upcoming lesson. Home points and token reinforcements earned in the clinic were accumulated each session. Children saved or exchanged points/tokens at the Clinic Store upon completion of each session. After each session a new BRC card was given to the parents with the newly introduced skills added to the card.

After introducing the session topic, handout, and BRC for that week, each conflict (e.g., an unshareable toy/family resource that both siblings want to use at the same time) was modeled, as well as skillful (e.g., taking turns) and unskilled (e.g., angry, yelling, stomping off) child reactions to that conflict. The adult actors manipulated a "Brother Doll" and a "Sister Doll" during training sequences. Models of parenting reactions to child efforts were also provided, although not for every element of that session's curriculum. Next, the siblings role-played the targeted skill(s) for the relevant context. Correct role-plays earned two tokens on the Dry Erase Board. On some occasions, parents practiced detecting the conflict, waiting and observing child efforts, and presenting a combined labeled social reinforcer plus token reinforcer for unprompted

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independent skill demonstrations by children or by the actors. Parents also practiced prompting the child(ren) when mistakes were made instead of the targeted skill (i.e., "Help"). Only social reinforcers were used following skillful resolutions that were preceded by a parental prompt. Given time constraints and the necessity of retaining the interest and attention of all participants, parent token reinforcement and prompting rehearsals were not performed for every skill presented during the session. Throughout the modeling and role-play processes, the therapist asked children specific questions about the mistakes or skillful responses made by the actors, or in the case of skillful role-playing, about what their sibling or parent had just done correctly. As noted above, correct answers to questions yielded one token reinforcer on the Dry Erase Board. Upon completion of the first defined targeted skill for that session, the next skill was introduced and the sequence of training repeated. Children accessed the Clinic Store at the end of each session.

        Review Component. Beginning with Session 2, siblings role played skills introduced during the previous session. Parent skills of delivering token reinforcement and Help at home were sampled during that review process. For example, when the siblings successfully displayed the desired skill, parents were often asked to practice awarding token reinforcement on a practice BRC. If the siblings successfully role-played all of the previous session's skills during the review, the actors presented a scenario that included a mistake so that the parent had an opportunity to practice "helping." If the parent made an error during the review, the mistake was discussed and the actors repeated the sequence, which allowed the parent a second trial. The content of each lesson is described below for each of the five SCRST-FV sessions.

General Session Outline Applicable to all five SCRST-FV sessions

1. Actors Model Conflict → Aggression

    a. Query directed at target siblings:

        i. What did the dolls do wrong?

        ii. Why is it wrong?

    b. Siblings awarded clinic points for correct answers.

2. Actors Model Skill

    a. Query directed at siblings:

        i. What is one smart thing that the dolls did differently this time?

    b. Siblings awarded clinic points for correct answers; errors or no-response resulted in a variety of teaching strategies, including re-modeling, adding prompts ("hints") prior to re-questioning, and asking a skillful older sib.

3. Siblings Role-play Skill

    a. Siblings awarded clinic points for correctly role-playing skill; errors or no-response evoked an expanded variety of teaching strategies, including re-modeling and various prompts during the role-play sequence itself, including therapist proximity, gestures, verbal directions, shaping, and fading initial prompts during immediate re-trials after successful responses guided by prompts.

4. Model Parent Token Delivery on BRC

    a. Parent role-played token reinforcement for skill use following the therapist model (Beginning in Session 2, the parent role-play of token reinforcement were integrated into step 3, when possible)

5. Model Parent Help

a. Parent role-played Help following the therapist model with the actors. Note that if children made mistakes during role-plays, the primary therapist engaged training options discussed above, rather than asking the parent to Help their own children during initial trials with a new skill; parent Help was used during the Review process of Sessions 2-5.

Session 1: SCRST-FV

The first session focused on sibling disputes that occur over toys or household equipment that belong to the whole family. This includes items that can be shared (e.g., blocks or Legos), as well as items that are not shareable (e.g., a computer), and considers instances when a decision about who can access the object first arises. Skills for Session 1 are outlined below:

1. Requesting access to shareable items currently in use by a sibling

    a. make a polite request

    b. provide a reason

    c. provide another reason

    d. wait quietly

    e. socially reinforce the sibling for granting joint access

2. Request taking turns with non-shareable items

    a. making a polite request

    b. provide a reason

    c. suggest turn-taking turns

    d. request to be informed when that turn can be taken

    e. socially reinforce the sibling for allowing the turn to be granted

3. Suggest a tie-breaking strategy when both want to go first

a. acknowledge that both want to go first

b. allow the other to go first, and that it means you get to go tfirst next time, OR

c. suggest a tie breaking strategy

- "Rock/Paper/Scissors"

- Coin Toss

- Cultural Jingle alternating pointing (e.g., "Eenee, Meenee, Minee Mo, Catch a tiger by the toe, if he hollers let him go, my mother says you go first").

The parents were sent home with a BRC and a handout for Session 1. The BRC for Week 1 included columns for Share, Take-Turns, Tiebreak and Help.

Session 2-SCRST-FV

Review. The children were asked to role-play the appropriate skill in each of the three conflicts presented in Session 1 (i.e., Share, Take-Turns, and Tiebreak) for review.

The second session was designed to introduce conflicts over sibling noncompliance to common requests one sibling might make to his sister/brother, as well as skillful resolutions given noncompliance. The therapist and his/her assistants acted out scenarios in which one child disagrees with a sibling request to which there is a legitimate choice, (e.g., when a sibling wishes to borrow another child's personal possession, desires a playmate, or wants help with a task). The child who received the request always had the right to either deny or to grant the request. The general skills for Session 2 are as follows:

1. Sibling Requests

a. ask nicely

b. provide a reason

c. give more reasons

d. make a deal (quid pro quo)

e. take "no" for an answer

The therapist and actors modeled three common conflicts, as well as conflict resolution strategies across these three different contexts:

1. Sibling 1 wants to borrow property from Sibling 2

2. Sibling 1 wants a playmate and Sibling 2 is currently occupied

3. Sibling 1 wants help from Sibling 2

The parent was sent home with a new BRC and a handout for Session 2. The new BRC included the previous skills from Session 1 (i.e., share, take-turns, tie-breaking, and help), and added Session 2's skill on a column labeled "Sibling Requests".

Session 3-SCRST-FV

Review. The children were asked to role-play the appropriate skill in each of the conflicts presented in Session 2 (i.e., sibling noncompliance following a request to borrow the sibling's property, a request for a playmate, and a request for help). Parents were asked to respond appropriately to the sibling's attempts (i.e., Help siblings if necessary, or award token reinforcement if the siblings successfully displayed the skills).

The third session introduced assertiveness skills for managing sibling violations of the other's personal rights. Three scenarios in which one child is violating the other child's rights were used to practice the skills:

1. taking the sibling's property without permission;

2. invading the child's space (room/bed);

3. violating a limit previously set by the sibling.

The therapist and actors demonstrated these three common conflicts and conflict resolution strategies for each of the scenarios using the following skill set:

1. Given a Violation of Rights: takes personal property without permission OR enters room without permission, OR ignores sibling limit placed on conditional use:

    a. Assertive statement + reasons

    b. Provide additional reasons

    c. Seek assistance from an adult for continued violation of rights by the sibling

The parent was sent home with a new BRC and a handout for Session 3. The new BRC included the previous skills from Session 1 and 2 (i.e., share, take-turns, tie-breaking, sibling requests, and help), and added a new column for Session 3's skill of Assertiveness. To manage space on the BRC, the three skills involving disputes over objects were often listed under one column labeled, "Object Disputes".

Session 4-SCRST-FV

Review. The children were asked to demonstrate the appropriate skill in each of the conflict scenarios presented in Session 3 (i.e., assertiveness skills when a sibling: takes personal property without permission OR enters room without permission OR ignores a previously established sibling limit). Parents were asked to respond to the sibling's attempts (i.e., Help siblings if necessary, or praise and award a token on a BRC).

The fourth session introduced skills to manage verbal harassment of one sibling by another.

1. Given Verbal Harassment of Sibling 2 by Sibling 1 while Sibling 2 was actively engaged in a task at a table (e.g., school project; drawing):

a. Polite responsivity (e.g., smile, comment on Sib 1's "complaint", be social) to deflect the verbal rudeness, if that fails…

b. Polite responsivity PLUS active ignoring (turn head/body away from Sib 1), if that fails…

c. Polite responsivity, active ignoring, and suggest the sibling "join in" the activity or an alternative activity (e.g. "there are plenty of materials here if you'd like to play too"; OR "there are lots of things you might do, such as…") if that fails…

d. Polite responsivity, active ignoring, suggest activity, followed by Verbal Assertion ("Please leave me alone; I need to do this by myself." if that fails…

e. See adult assistance when the sibling disobeys the assertive statement

Parents were taught to reinforce the sibling's right to be left to do his/her work/project in peace, supporting the Sibling 2's's suggestions to find alternative activities to substitute for Sibling 1's continued teasing/harassment of Sibling 2.

The parent was sent home with a new BRC and a handout for Session 4. The new BRC included the previous skills from Sessions 1, 2, and 3 (i.e., object disputes, requests, assertiveness and help). In order to fit skills on to one BRC for two siblings, "Manage Tease" was considered an extension of assertiveness and therefore, the new BRC was identical to the previous week's.

Session 5-SCRST-FV

Review. The fifth and final session of the SCRST-FV protocol provided a review of all skills presented during Sessions 1 through 4. Siblings and their parents reviewed the skills in the same format as the review component of Sessions 1-4 by role-playing with the actors. Each of the conflict scenarios were sampled at least once for a minimum total of six role-plays. The

actors created a parent Help situation or a parent token reinforcement situation to review these two essential parenting skills. Children continued to earn tokens and receive feedback throughout the review process.

The fifth session also introduced the use of Session 3 Assertiveness skills to be applied when a sibling manifests rude touching or actual physical aggression. Children were taught to step back, stand up, and point firmly at the sibling and sternly state, "Don't Touch Me!" Below is a breakdown of Session 5 Assertiveness skills:

1. Verbal Harassment (Session 4) escalates to rude touch (e.g., ignoring provokes rude touch),

    a. Stand and gesture to demonstrate assertiveness with one's body

    b. Assertive statement (e.g., "Don't touch me!")

    c. Seek assistance from parent if rude touch continues

2. Rude Touch escalates to physical aggression (i.e., push aggressively)

    a. Actor responds to assertiveness with:

        i. "I'll touch you if I want to!!!"

        ii. Pushes doll

    b. Model skill to immediately seek adult assistance for physical aggression

The parent was sent home with a new BRC and a handout for Session 5. The new BRC included the previous skills from Sessions 1, 2, 3, and 4 (i.e., object disputes, requests, assertiveness, and Help). Again, in order to save space on the BRC and to prevent parents from having to manage two different cards (one BRC per child), we included Managing rude touch as an extension of Session 3's assertiveness skills and therefore, the BRC sent home was identical to the two previous week's.

Post-intervention The following outlines the sequence of procedures and assessments performed during the two post-intervention sessions that followed the successful completion of the five SCRST-FV sessions. Note that at least one week of home BRC data collection was obtained after SCRST-FV Session 5 and before Post Intervention Session 1

Session 1: Post-Intervention Assessment

- The returned BRC was reviewed with the family and points were awarded for the Clinic Store Accounts, based on tokens earned at home for unprompted skill use.

- The parent repeated (in private) the BRC training protocol to re-sensitize her/him to accurately record aggression and noncompliance that occurred at home during the 2-week post intervention period that followed. Those two BRCs were kept private from the children, as per all procedures for the initial 2-week baseline period. In addition to coding sibling aggression on the private BRCs, parents were to continue all current SCRST-FV home procedures and retain records on two public BRCs, which included Help and Reinforce. The two public BRCs were virtually identical to that sent home after SCRST-FV Session 5.

- The Clinic Store Exchange process was performed as per the end of each SCRST-FV session; the two public BRCs were reviewed with the children.

- Both the public BRCs and the private BRCs were constructed for a two-week period, necessitating 2 BRCs for both the public and private formats.

Session 2: Post-Assessment (approximately 2 weeks after Session 1)

- The returned public BRCs were reviewed with the family and points were awarded for the Clinic Store Accounts, based on tokens earned at home for unprompted skill use.

- Children repeated the Sibling Play Analog.

- Each child then individually repeated the SCRS-III, using the alternate form from that used at pre-intervention.

- The parent completed a CBCL for each sibling during the SPA or SCRS-III administrations.

- The parent was invited to complete the Treatment Acceptability Form and submit it without family identification to the Psychology Clinic Office staff.

- Once all child assessments were completed, the parent met in private with the therapist to consider child progress and optional courses of action. Recommendations were based on graphs of BRC child aggression and noncompliance from pre- to post-intervention, professional judgment based on clinical normative expectations for ages of the participating children, and parental preferences.

- The children accessed the Clinic Store to exchange accumulated points, including points earned during the 2-week post intervention period.

Results

The following family characteristics of the six families who completed all five sessions of the SCRST-FV protocol were obtained during the initial assessment session at the ISU Psychology Clinic.

Family Demographic Characteristics

Family #	Culture	Younger Sib Age (Sex)	Older Sib Age (Sex)	Family Size	Active 3rd sibling?	Marital Status	Parent Participation
7	Euro-American	8.3(F)	10.1(F)	5	6.0 (F)	Divorced	Mother; Father sporadic
9	Hispanic	4.9(M)	6.5(F)	7	None	Married	Mother
13	Hispanic	5.1(M)	6.0(F)	6	None	Married	Mother
15	Euro-American	6.0(M)	8.5(F)	6	3.9 (F)	Married	Mother; Father Sporadic
16	Euro-American	5.9(M)	7.3(M)	6	4.2 (M)	Married	Mother & Father
26	Euro-American	7.6(F)	10.0(M)	6	None	Divorced	Mother; Father (once)

Each family's Social Economic Status was estimated using the Barratt Simplified Measure of Social Status (BSMSS) (2006). This index yields a score between 8 (i.e., Less than 7th grade education + unskilled labor) and 66 (i.e., graduate degree + professional position), which purportedly possesses ordinal value, appropriate for correlational analyses. The BSMSS is not meant to identify specific social economic categories. For the six families who qualified for the project and who completed the SCRST-FV protocol, the average BSMSS score was 42.8 (range 12 to 66; standard deviation = 20.9). Notably, The BSMSS system, which was designed to be completed by college students participating in research on campus, does not define

"homemaker" or "student" as possible parent occupations. Therefore, the other parent's occupation was used for Families 7, 13, and 16, since the occupation role defined by Barratt is the average of the parents' two occupational scores.

Observer Accuracy Estimates

SCRS-III item scores were based on the scoring system described by Nakaha et al. (2016). Revisions to that scoring system were made for the current study in order to eliminate coder confusion regarding repetitions of requests and repetitions of verbal assertions. Based on the number of requests and/or verbal assertions, a child's response to a specific item could range from as high as a 4 (i.e., ≤ 2 repetitions) to as low as a 2 (i.e., 3 or more repetitions). Two coders were involved in scoring all available SCRS-III administrations. The primary coder was kept unaware of the session status (pre- or post-treatment). The reliability coder served as the trainer of the primary coder and was aware of the session status. Only the primary coder's data were used for analyses; the reliability coder's data were used to estimate the accuracy of the primary coder's data. Training included discussion, modeling, and reviews of independent coding efforts to clarify disagreements. Practice videotapes were available from families who consented to the project, but subsequently discontinued for a variety of reasons. The primary and reliability coder independently scored the SCRS-III administrations reported below in Table 1, which included ten SCRS-III pre-tests and four SCRS-III post-tests.

First, the average item scores for each child obtained independently by each coder were compared. Group mean scores are reported in Table 1. Two statistical comparisons were performed to evaluate the degree of coder correspondence. First, the correlation between the two independent coders was calculated, yielding inter-observer reliability coefficients of $r = .923$ at pre-test and $r = .923$ at post-test. Agreement at the item level was also calculated. The number of

exact agreements across each item was divided by the number of opportunities (i.e., 16 items for

each SCRS-III test times the number of independently coded SCRS-III-measurements). These

agreement ratios are also included in Table 1.

Table 1

Observer Accuracy Estimates for SCRS-III

Pre vs Post SCRS-III: Sibling	Primary Coder $\overline{X}$ (S$_x$)	Reliability Coder $\overline{X}$ (S$_x$)	Item Agreement Ratios
Pre-SCRS-III: Younger Sibling	3.6 (0.7)	3.5 (0.6)	89% (71/80)
Pre-SCRS-III: Older Sibling	3.9 (0.4)	4.0 (0.3)	79% (63/80)
Post-SCRS-III: Younger Sibling	3.8 (0.3)	4.1 (0.4)	72% (23/32)
Post-SCRS-III: Older Sibling	4.5 (0.2)	4.5 (0.1)	97% (31/32)

Observer accuracy data were not obtained for the SPA at pre- or post-testing. SPA

accuracy data have been previously reported by Nakaha et al. (2016, Table 1, p.126) for both

occurrence agreement ratios and inter-rater reliability coefficients for the five codes of the SPA:

Angry-Yell, Verbal Harassment, Physical Antagonism, Justification, and Cooperative Play.

Occurrence ratios derived by independent review of videotapes ranged from 50% to 100%, while

inter-rater reliability coefficients ranged from $r = .738$ to $r = .992$ (Nakaha et al., 2016).

Data Analyses

For all six participating families, the SCRST-FV sessions were videotaped. Note that one family dropped out after completing the SCRST-FV protocol without completing post-treatment testing. SCRS-III data were missing at post-testing for two younger and one older sibling as a result of audio recording malfunction (both children in Family 13) and refusal to participate (the younger sibling from Family 7). These unfortunate events reduced the sample sizes and statistical power for pre- versus post-treatment analyses, but not for the process data obtained during the five SCRST-FV sessions reported below for all six families.

Descriptive Process Data obtained during SCRST-FV Sessions

Essential training elements common to all five SCRST-FV sessions are reported below for each session separately. Specifically, for each session the number of models presented to all family members was counted, as well as the number of role-plays and questions directed at the two target siblings (Table 2). Table 3 provides the number of models and role-plays across sessions for the two parenting skills: Helping and Reinforcing. The number of tokens earned by target siblings in each SCRST-FV session is presented in Table 4, while session duration data are offered in Table 5. Sample size across Tables 2-5 was six families for Sessions 1-3. Sample size was reduced to five families for Sessions 4-5. The SCRST-FV curriculum was adjusted for Family #13 as a result of limitations in developmental readiness to address the complicated Verbal Harassment curriculum of Session 4 and a need to emphasize methods to manage Rude Touch and Fight during Session 5. Consequently, Family #13's curriculum was not comparable to the other five families during Sessions 4 and 5, and therefore, excluded.

Table 2

Child Skill Training Across Sessions

Session #	Therapist Models		Younger Sibling		Older Sibling	
	Mistakes $\overline{X}$ (S$_x$)	Skills $\overline{X}$ (S$_x$)	Questions $\overline{X}$ (S$_x$)	Role-Plays $\overline{X}$ (S$_x$)	Questions $\overline{X}$ (S$_x$)	Role-plays $\overline{X}$ (S$_x$)
1	5.0(1.1)	8.5(1.2)	17.8(9.3)	3.2(0.8)	19.3(5.3)	3.5(0.5)
2	2.4(1.1)	3.8(0.8)	16.2(9.0)	2.8(1.6)	16.6(9.2)	2.8(1.6)
3	2.5(0.8)	4.0(0.9)	9.0(4.4)	3.0(1.7)	13.2(9.6)	3.0(1.7)
4	1.6(0.9)	4.6(0.9)	11.4(2.0)	4.0(2.2)	15.8(2.3)	5.0(0.0)
5	1.2(0.4)	2.6(0.9)	11.6(3.0)	4.8(2.7)	12.2(2.9)	6.0(0.0)

Table 3

Parent Skill Training Across Sessions

Session #	Therapist Models		Parent Role-Play	
	Help $\overline{X}$ (S$_x$)	Reinforce $\overline{X}$ (S$_x$)	Help $\overline{X}$ (S$_x$)	Reinforce $\overline{X}$ (S$_x$)
1	1.3 (0.5)	1.5 (0.8)	1.7 (0.5)	2.7 (1.0)
2	0.2 (0.4)	0.4 (0.5)	2.6 (1.1)	2.8 (2.7)
3	1.2 (1.5)	0.7 (0.5)	4.5 (2.8)	2.2 (1.8)
4	0.4 (0.9)	0.4 (0.9)	5.0 (2.1)	4.0 (2.1)
5	1.4 (0.5)	1.4 (0.9)	5.0 (2.0)	4.6 (0.9)

Table 4

Tokens Earned by Targeted Children Across Sessions

Session #	Younger Siblings $\overline{X}$ (S$_x$)	Older Siblings $\overline{X}$ (S$_x$)
1	18.0 (8.6)	21.8 (2.6)
2	19.3 (7.8)	20.7 (6.4)
3	16.0 (6.1)	17.6 (5.4)
4	19.0 (4.5)	23.2 (5.2)
5	21.4 (5.0)	26.0 (2.3)

Table 5

SCRST-FV Treatment Session Duration Data in Minutes

Session #	Mean (SD)	Range
1	35.2 (5.1)	27.3 to 40.5
2	35.5 (6.7)	25.5 to 44.3
3	32.5 (5.6)	26.1 to 38.5
4	39.9 (6.4)	36.2 to 51.1
5	38.5 (7.9)	29.6 to 51.1

In addition to SCRST-FV descriptive process data, the range of therapists should be noted. Three different students performed in the therapist role (and one faculty member just once). Babbitt performed the preponderance of lead therapist roles across the six families who

completed the project (77%, 23 of 30 total sessions), while eight students and two faculty

members performed in the actor/child roles.

Behavior Record Card data are reported in Table 6 to quantify the total amount of parent

Help and Reinforcement at home reported each week. The sample size for Weeks 1-4 was six

families; since Family #26 dropped out after Session 5, no BRC data were returned, reducing

sample size to five for Week 5. Help totals are for the sibling dyad, whereas Reinforcement

Totals represent allocations to individuals.

Table 6

Behavior Record Card Total Help and Reinforce Counts per week

	Help		Reinforce	
Week	$\overline{X}$	(S_x)	Younger $\overline{X}$ (S_x)	Older $\overline{X}$ (S_x)
1	2.8	(2.4)	7.0 (4.0)	6.7 (3.4)
2	3.7	(2.3)	11.0 (3.8)	11.4 (3.6)
3	6.8	(4.4)	16.2 (16.0)	16.0 (18.1)
4	1.6	(2.4)	10.7 (8.0)	8.5 (6.3)
5	4.4	(3.8)	13.8 (9.2)	14.4 (12.7)

The Reinforcement data presented in Table 6 represent the sum of all token reinforcement

delivered by the parent during each week, regardless of the skill displayed. To break that total

down by specific skill, Table 7 was created. As noted above, Week 4 and 5 skills were integrated

into the "Assertiveness" column on the BRC beginning in Week 4 to save space. As such, the

BRCs sent home were identical for Weeks 3-5, eliminating the possibility of characterizing the

Reinforcement data across the various conflicts that all legitimately provoked assertiveness, or

the complicated Verbal Harassment skills that may have been effective, yet not elevated to the
need to be assertive.

Table 7

Siblings Skills Use at Home recorded on Behavior Record Cards

	Younger Sibling			Older Sibling		
BRC #	Object Disputes	Requests	Assertive	Object Disputes	Requests	Assertive
Week 1	7 (4.0)	-	-	6.7 (3.4)	-	-
Week 2	8.5 (2.8)	2.5 (4.2)	-	8.5 (2.8)	3.0 (4.5)	-
Week 3	10.0 (14.1)	3.5 (4.3)	1.7 (1.9)	10.0 (12.9)	3.5 (3.7)	1.7 (2.3)
Week 4	5.2 (5.7)	2.8 (2.2)	2.7 (2.8)	4.3 (4.8)	2.3 (1.4)	1.8 (6.3)
Week 5	9.8 (8.3)	3.2 (2.4)	1.0 (1.4)	8.6 (9.7)	3.6 (2.6)	1.8 (0.8)

Note. Data presented as mean occurrence per week.

Outcome Data Analyses

Descriptive statistics and analyses for the pre- and post- measures are presented below.
All analyses are one-tailed, paired t-tests. Specifically, mean daily frequencies for aggression are
presented in Table 8, while mean daily frequencies for noncompliance are presented in Table 9.
Table 10 presents SCRS-III average item scores for targeted children. Table 11 displays SPA
data for each of the five response classes coded. Data from the parent-completed Child Behavior
Checklist are presented in Table 12.

1. Behavior Record Card Data

Table 8

Mean Daily Frequency Rates of Aggression at Pre- and Post-Intervention

	Younger Siblings			Older Siblings		
	Pre-	Post-	t	Pre-	Post-	t
$\bar{X}$	2.2	0.4	2.8*	2.8	0.7	2.4*
(S_x)	(1.4)	(0.3)		(2.0)	(0.7)	
Range	0.8 – 4.5	0.1 – 0.8		0.4 - 5.9	0.0 - 1.6	

Note. n = 5, *df* = 4 for both groups, * *p* < .05

It was hypothesized that children who completed the SCRST-FV sessions would substitute skillful strategies for physical fighting to resolve sibling disputes. If so, physical fighting frequency should decline at post-treatment, relative to baseline. Consequently, BRC mean daily aggression rates were compared for both younger and older siblings at pre-treatment versus post-treatment. A one-tailed, paired *t* statistic was analyzed for both younger and older siblings. As predicted, both younger, $t\ (4) = 2.8$, *p* <.05, and older, $t\ (4) = 2.4$, *p* < .05, siblings displayed significant decreases in aggression after completing the SCRST-FV.

Table 9

Mean Daily Frequency Rates of Noncompliance Pre- to Post-Intervention

	Younger Siblings			Older Siblings		
	Pre-	Post-	t	Pre-	Post-	t
$\bar{X}$	3.8	2.2	1.8	3.3	1.3	2.1*
(S_x)	(1.3)	(1.9)		(1.8)	(1.5)	
Range	1.8 – 5.2	0.3 – 4.5		1.1 - 5.9	0.1 - 3.6	

N = 5, *df* = 4 for both groups, * *p* < .05

Since we did not target noncompliance via the SCRST-FV protocol, no hypothesis was offered about possible changes in mean daily frequencies of noncompliance. Since aggression declined, and since both aggression and noncompliance are part of a larger response class best labeled as pre-adolescent coercion, a test of response generalization was performed. Older siblings appeared to manifest that generalization, t (4) = 2.1, p = .05, reducing their mean daily noncompliance rates from pre- to post-treatment, whereas younger siblings did not, t (4) = 1.8, p = .07.

2. Clinic Analog Data

A. Sibling Conflict Resolution Scale-III edition

Table 10

SCRS-III Average Item Scores for Pre and Post-SCRST-FV

	Younger Siblings			Older Siblings		
	Pre-Test	Post-Test	t	Pre-Test	Post-Test	t
$\overline{X}$	3.1	3.7	3.9*	3.9	4.5	12.0**
(S_x)	(0.06)	(0.23)		(0.17)	(0.17)	
Range	3.1 - 3.3	3.6 - 4.0		3.7 - 4.1	4.3 - 4.6	

Note. For younger siblings, n = 3, df = 2 * p < .05; For older siblings, n = 4, df = 3 ** p < .001; Scores on this measure range from 1.0 to 5.0, where 1.0 = physical aggression, 3.0 = neutral response, and 5.0 = verbally appropriate, sophisticated response

It was also hypothesized that children would manifest significantly improved SCRS-III average item scores from pre- to post-intervention. The same one-tailed t statistic was analyzed for both younger and older siblings. Table 10 presents the descriptive data and paired t-tests, comparing the pre-SCRS-III means with the post-SCRS-III means. As shown in Table 10, both younger and older siblings significantly improved their performance on SCRS-III after

completing the SCRST-FV. Figure 1 depicts the data presented in Table 10. Please note, scores

on the SCRS-III range from 1.0 – 5.0, where 1 = physical aggression, 2 = negative verbalization,

3 = neutral, 4 = incomplete verbal solution, 5 = sophisticated verbal solution.

Figure 1

Pre/Post SCRS-III Mean Item Scores by Sibling
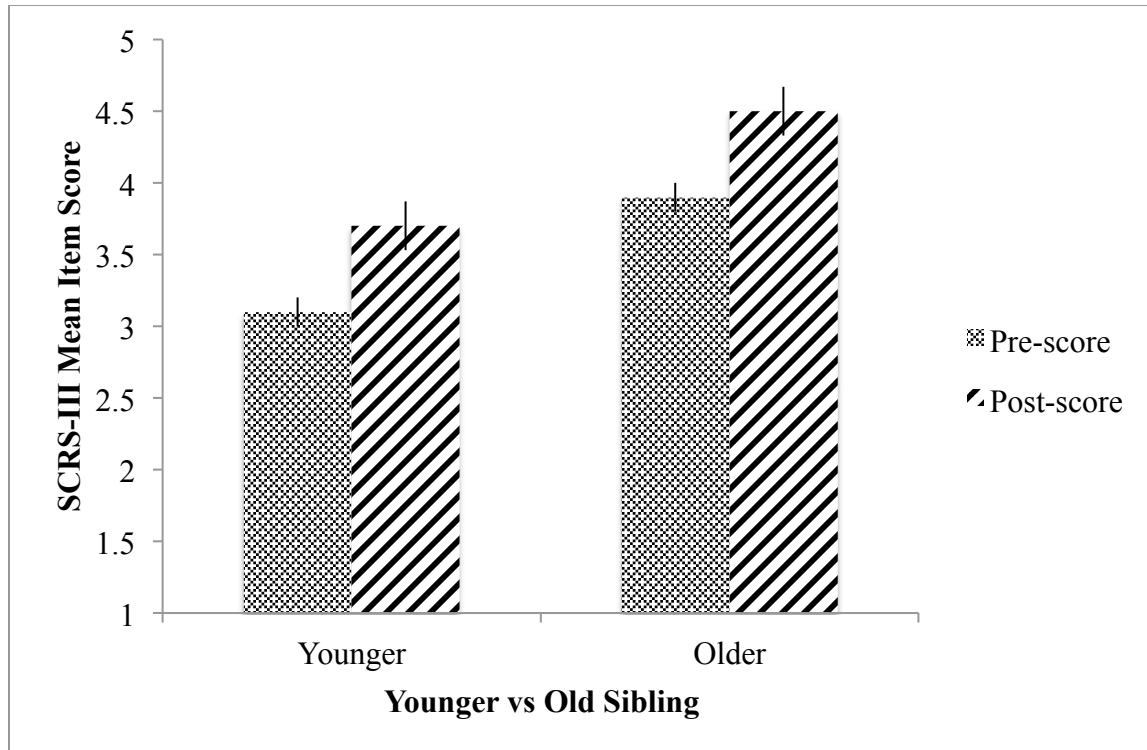
B. Sibling Play Analog

Table 11

SPA Percent Occurrence for Pre- and Post-SCRST-FV

Behavior Class	Pre-SPA	Post-SPA	t
Angry-yell	3.0% (2.4)	1.3% (2.5)	1.5
Physical Antagonism	2.3% (3.3)	1.0% (1.2)	1
Verbal Harassment	1.3% (1.5)	0.5% (1.0)	0.6
Justification	11.8% (12.2)	3.3% (2.9)	1.7
Cooperative Play	42.3% (31.0)	48.% (29.3)	-0.9

Note. SPA data are dyadic; n = 4, df = 3, p > .05 for all five tests across the 5 categories of behavior

Pre/post SPA percent occurrences were compared for each of the five behavior classes using a one-tailed, paired t statistic. No significant differences on the SPA were present from pre- to post-SCRST-FV.

3. Questionnaire Data

Table 12

Parent Completed Child Behavior Checklist

	Younger Siblings			Older Siblings		
	Pre-Test	Post-Test		Pre-Test	Post-Test	
Subscale	$\overline{X}$ (Sx)	$\overline{X}$ (Sx)	t	$\overline{X}$ (Sx)	$\overline{X}$ (Sx)	t
Aggressive	58.4 (9.5)	54.6 (6.2)	1.4	65.6	61.2	1.4
Behavior				(13.2)	(12.1)	
Rule-Breaking	54.5(4.9)	54.0 (5.6)	1.0	60.2 (9.1)	57.4 (7.8)	1.9

Note. Scores are presented in T-scores. P > .05 for all analyses. For younger siblings, n = 5, df = 4 for aggressive behavior n = 2, df = 1 for rule-breaking behavior. For older siblings, n = 5, df = 4 for both aggressive behavior and rule-breaking behavior.

A one-tailed, paired *t*-statistic was analyzed to compare pre vs. post parent ratings of target siblings on the two relevant CBCL scales. There were no significant changes in parent ratings from pre- to post-intervention for younger or older siblings on either the Aggressive Behavior or Rule-Breaking Behavior subscales of the CBCL.

4. **Parent Appraisal of the SCRST-FV Protocol**

Descriptive statistics for the parent completed Treatment Acceptability Ratings are presented below. Parents were asked to rate skills presented during the five week SCRST-FV intervention on a 1.0-7.0 scale, where 1 = "extremely not useful" and 7 = "extremely useful" in terms of "improving how well your children get along". Means and standard deviations of skill utility are presented in Table 13.

Table 13

Parent Ratings of SCRST-FV Skill Utility

SCRST-FV Skill:	Mean	Standard Deviation
Family Property/Object Disputes	6.5	0.9
Sibling Requests	6.0	0.8
Assertiveness	6.2	0.9
Managing Verbal Harassment	5.8	1.1
Managing Physical Harassment	5.2	1.4

Parents were also ask to rate how difficult it was to provide the recommended Token Reinforcement and Help procedures at home. The same 7-point scale was used where 1 = "extremely easy" and 7 = "extremely difficult". Descriptive statistics are provided in Table 14 below.

Table 14

Parent Ratings of SCRST-FV Difficulty of Implementing Home Procedures

	Mean	Standard Deviation
Token Reinforcement	3.8	1.6
Help	3.4	1.5

Discussion

Participating Families

During the period of active recruitment from March 2016 through June 2017, 20 families responded to announcements about the program, but were never evaluated for a variety of reasons. A total of 19 families participated in at least the initial Pre-intervention Evaluation Session. Of those 19 families, 4 did not return for the second evaluation session and 6 did not meet eligibility requirements for the project for one of two reasons: neither child was sufficiently aggressive (3 families); or one child exceeded the SCRS-III skill criterion (3 families). Of the remaining 9 families, 7 participated in the SCRST-FV protocol and 2 were randomly assigned to the subsequently discontinued control condition (PMMP). A total of five families completed the SCRST-FV protocol and its associated post-intervention evaluations. Unfortunately, one eligible family dropped out after SCRST-FV Session 1 and a second dropped out after SCRST-FV Session 5.

Recruitment was difficult and certainly a limitation of the project. Indeed, problems with recruitment decreased the desired sample size by nearly 50%, (i.e., from a proposed 8-10 families in each of two treatment conditions to a final sample size of 5 in just one treatment condition) and resulted in the discontinuation of the randomized control trial design, limiting the project to a small sample, uncontrolled clinical trial. It is not known why the recruitment process was so unsuccessful, given the effort expended. Family drop out was also a problem in conducting the project: four families discontinued after Evaluation Session 1; one dropped out after two sessions of the subsequently discontinued PMMP intervention; one dropped out after one session of SCRST-FV intervention. This happens, it is part of our profession. It is assumed that in any given clinical sample of participants there will be elements of the assessment or initial

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treatment sessions that do no match up well with the consumer's expectations, resulting in low, but significant drop out rates. It is troubling, however, that one family dropped out after completing all five sessions of SCRST-FV, declining to participate in the post-treatment evaluations sessions. That was inexplicable and discouraging.

The six families that completed the entire SCRST-FV protocol are described in the Family Demographic Characteristics entry on page 48. The sample was predominantly comprised of married, European-American families, with the mother serving as the consistently active parent in the family therapy process. The proportion of Hispanic participants (2 of 6) and divorced parents (2 of 6) are noticeable in such a small sample. These demographics are consistent, however, with samples participating in prior sibling research at Idaho State University and might be considered representative of rural Southeastern Idaho. The target siblings were balanced in regards to gender (female = 6; male = 6), yet unbalanced for sex of the dyad: 4 male/female; 1 female/female; 1 male/male. Sibling dyad sex has been an important and predictive variable in sibling research for decades, with male siblings consistently observed and rated as more problematic than female siblings. Probably the most important qualification of the sample, however, is its small size. Statistical tests of change were limited to as few as three subjects and as many as six, depending on the specific data analysis performed. This small sample size directly limited the statistical power to detect small differences and certainly limits the replicability and generalizability of the data discussed below.

Observer Accuracy

Observer accuracy estimates were calculated for the SCRS-III (see Table 1). At the very conservative item level of comparison, agreement ratios ranged between 72% and 97%. At the more liberal total score level of comparison, independently derived average item scores were not

significantly different between two independent coders. Moreover, average item scores yielded highly significant inter-observer reliability coefficients at both pre-intervention ($r = .923$) and post-intervention ($r = .923$). Overall, the SCRS-III yielded good observer accuracy consistent with estimates from previous research (e.g., Grimes, 2012 & 2014; Babbitt, 2015). Importantly, the primary coder was kept blind regarding a video's status relative to treatment (pre- vs. post-intervention), adding more strength to the interpretability of the SCRS-III improvements at post-intervention (Table 10).

Unfortunately, the research team was unable to perform the work required to evaluate coding accuracy for the Sibling Play Analog (SPA) or the home Behavior Record Cards (BRCs). Prior estimates of acceptable coding accuracy have been reported by Nakaha et al. (2016) for the five SPA codes, while in-home detection of aggression and noncompliance on BRCs has yielded modest, but acceptable levels of accuracy and highly reliable frequencies of both noncompliance and aggression (Nadler & Roberts, 2013). The failure of SPA data (Table 11) to reveal any systematic changes at post-intervention may be in part a result of poor coding accuracy. More importantly, the significant decline in aggression frequency from pre- to post-treatment (Table 8) may reflect biased coding by parents who fully expected their children to reduce the frequency of fighting, given the effort and time expended toward teaching and motivating their children to resolve conflicts with skills, rather than actual reductions in aggression. The lack of an accuracy check on sibling aggression detection and recording significantly qualifies the measured reduction in sibling aggression reported in Table 8.

Process Data Analyses of the SCRST-FV Intervention Sessions

Delivery of the SCRST-FV intervention involved one primary therapist, two therapist assistants or "actors", at least one parent, and at least two target siblings for each of the five

sessions. However, only Family # 9 consistently participated with these minimums. All remaining families participated with three or more children (e.g., Family #15 brought 5 children to each session, including a 2-year old and an infant, while Family #16 brought 4 children, including an infant and both parents). Consequently, the SCSRT-FV protocol places a high demand on the primary therapist to consistently implement the curriculum while maintaining positive relationships with all participants and preventing disengagement, boredom, restlessness, or worse, the lack of needed care to a non-targeted younger sibling. The retention of all but one of seven families throughout the five-session SCRST-FV protocol suggests the primary therapist was largely successful in this task.

Protocol adherence with the defined SCRST-FV intervention (pp. 36-45) appears to have been reasonably successful. Descriptive data for each session are provided in Tables 2-5. Given the small sample size and the lack of an independent coder of the session videos, no statistical analyses for possible trends or differences (e.g., across or within sessions) were performed. Instead, the obtained means and standard deviations of the various metrics are simply discussed below as measurement-based evidence for future research with the SCRST-FV. First, the descriptive data in Tables 2 and 3 demonstrate that during each session the three teaching tools (i.e., modeling, questioning, and role-playing) required by the curriculum were manifested as expected. Specifically, Table 2 reveals that both mistakes and skills were repeatedly modeled during each session, with an emphasis on the modeled skills (i.e., a consistently higher mean number of skills were modeled than mistakes). Similarly, both questions and role-play sequences were evident, with an emphasis on questions for both the younger and older sibling. It appears that asking questions, which provoke cognitive/verbal responses, are easier and faster to deliver during SCRST-FV sessions than role-plays, which require verbal and motor performance in

response to an actor. It is also possible, however, that the primary therapist used questions to maintain the interest and attention of the children required to sit and watch their sibling (i.e., "the audience"). Remember that correct answers to questions yielded immediate social reinforcement and one token on the Dry Erase Board.

Table 3 provides modeling and role-play data for the two parenting skills to be used at home: Help and Reinforce. Note that Therapist Models were less emphasized than Parent Role-Plays consistently across sessions, often limited to a single or even zero models during a specific session. Possibly, the primary therapist relied on initial session modeling and focused on role-plays thereafter, since the mechanics of Help and Reinforce were the same for every unresolved sibling conflict (i.e., "What's the problem?"; "What could you do instead?"; enter 1 tally mark on the BRC Help column) and for every skill (i.e., "I am so pleased by what I just saw; you did X, instead of fighting; you both get one sticker!"). It also appeared that the number of Parent Role-Plays increased across sessions, possibly reflecting the gradually increasing number of skills.

Importantly, the standard deviations in Table 2 and Table 3 were low, relative to the means, suggesting the primary therapist was relatively consistent across families in engaging both the parents and target siblings by way of modeling, questioning, and role-plays. Specifically, the session mean was higher than the session standard deviation in 30 out of 30 comparisons in Table 2 (child training). In contrast, higher means were present in just 16 out of 20 comparisons in Table 3 (parent training), suggesting a greater differential number of therapist models for parents during Sessions 2 and 4 in particular.

Table 2 also suggests transitions in the primary therapist's choice of teaching tools across sessions. Modeling and questioning appear to decline, while role-playing appears to increase. It

is speculated that this apparent trend reflects the review process in each session which requires children to role-play the previous week's skill set and the final session which is almost entirely focused on role-playing all previous skills.

Table 4 describes a rich density of reinforced child responses during all five sessions, which are relatively balanced between younger and older siblings. The balancing is certainly an important therapeutic tool to avoid sibling rivalry and to avoid any child's consideration of an "unfair" distribution of tokens. Both rivalry and fairness are constructs found throughout the sibling literature and are certainly relevant during therapy session. Interestingly, the absolute value of the standard deviations in Table 4 are relatively higher than those found in Tables 2 and 3, suggesting the primary therapist discriminated across families in the number of tokens distributed. The variance across families reflected by the relatively high standard deviations is more difficult to interpret, but might reflect differential child acquisition rates. For example, children who are struggling to understand and perform a new skill might be given more opportunities to answer questions and to role-play (and hence, earn more tokens) than children who acquire the skill quickly.

Table 5 reflects a relatively consistent mean therapy session duration of 35 to 40 minutes across the six participating families, with relatively low standard deviations compared to the means. Session duration is an important practical concern, given billing requirements and the constraints imposed by busy schedules of both families and professional staff. It must be noted, however, that the data provided in Table 5 only reflect the duration of the training session. The training session was always preceded by a family review of home BRCs and a private meeting with the parent, and was always followed by the token exchange Clinic Store process.

Consequently, the total amount of clinic time was much longer than the Table 5 values, probably ranging from 60 to 90 minutes.

Home Implementation of the SCRST-FV protocol

Tables 6 and 7 provide evidence that: (1) children independently demonstrated sibling skills in the home virtually every day, and (2) parents provided prompts for skill use in the home on a regular basis. Table 6 contains descriptive statistics of Help and Reinforcement of sibling skills in the home across the five SCRST-FV intervention sessions. Notably, means for Reinforcement frequency of independent skill use by target siblings are more than double the frequency of Help each week (e.g., Week 1 Help $M = 2.8$ vs. Reinforcement $M > 6.0$), suggesting that children were appropriately applying skills (which were being detected by their parents) more often than they required "Help" getting along. However, (as shown in Table 6) target siblings did elicit Help from their parent(s) on a daily basis, meaning they failed to correctly apply appropriate skills and may have resorted to fighting/aggression. Nonetheless, data presented in Table 6 suggest that all family members participating in the SCRST-FV employed skills at home and that parents were willing to track these efforts on BRCs.

Table 7 breaks down each of the sibling skills by week to provide additional information on skills that were used most often in our sample. Siblings frequently (i.e., up to a maximum average of 10 times per week) independently demonstrated skills necessary to solve conflicts over Object Disputes (i.e., Share, Turn-taking, Tie-breaking) across the five week intervention. In contrast, assertiveness skills were less frequently implemented (between $1.0 - 2.7$ episodes per week, on average). Making effective Requests fell in the middle when comparing weekly averages across skill types, ranging from 2 to 3 per week. It is unclear why target siblings used certain skills more than others. One possible explanation is differences in skill difficulty and

success rates. For example, sharing is a skill that benefits both siblings and is fairly easy to implement (e.g., ask nicely plus reason), while assertiveness skills often require more than one step (e.g., ask nicely plus reasons; add more reasons; get an adult) and the other sibling may lack motivation to comply with the assertive sib (e.g., sib 1 does not want to return property they took without sib 2's permission). A second possibility is that specific conflict categories vary in frequency of occurrence. For example, Table 7 suggests that Object Disputes are more common than conflicts over Requests, which are in turn more likely than the violation of a sibling's rights that provoke Assertiveness. Finally, Table 7 also yielded lots of variance across families, as evidenced by several higher standard deviations than the relevant group mean. Indeed, 12 of the 24 standard deviations in Table 7 exceeded the respective mean for that week and skill type.

Outcome Data

Primary Hypotheses

The first primary hypothesis was that target siblings would manifest significantly improved SCRS-III average item scores from pre- to post-intervention. As predicted, both younger and older siblings enhanced their repertoire of conflict resolution skills from pre- to post-SCRST-FV (see Table 10), despite the low statistical power to detect a change. Moreover, this shift in SCRS-III average item scores is more than a statistically significant change for the older siblings. Specifically, the older sibling post treatment mean of 4.5 indicates the acquisition of a relatively sophisticated, contextually-relevant verbal repertoire of solutions to common sibling conflicts. This finding replicates and extends prior research (e.g., Babbitt, 2015; Grimes, 2014; Thomas & Roberts, 2009) with aggressive, clinic-referred children. Unfortunately, and as discussed in more depth in the Limitations section below, the research design precludes any

assertion of a causal relationship between the intervention and the significant improvement in conflict resolution skill repertoires.

The second primary hypothesis predicted a generalization from an improved sibling conflict resolution skill repertoire to a reduction in sibling aggression in the home. Presumably, children would use their improved repertoire of skills (Table 10), aided by parent Reinforcement and Help for the home use of that repertoire (Table 6), to substitute skills for aggression. Consistent with this hypothesis, both younger and older siblings displayed a significant decrease in aggressive episodes in the home following the SCRST-FV protocol (Table 8). Although our lack of experimental control precludes identification of the mechanism behind reduced physical fighting, the data are encouraging and theoretically reasonable. The participating siblings in this project lacked conflict resolution skills and were physically aggressive prior to treatment. They improved their skills, parents reinforced those skills and helped when needed, and sibling aggression rates declined. Unfortunately, the reasons behind these documented changes cannot yet be determined. Ideally, a randomized control trial that includes traditional motivational intervention alternatives (e.g., the discontinued PMMP intervention) and placebo conditions is indicated to rule out confounded explanations for the observed changes.

The results of this study suggest that skill building alone could be an appropriate intervention for managing sibling aggression, at least for some children. The inclusion of a parent-training component into the SCRST-FV skill-building program could be the reason behind this all-important generalization. Grimes (2014) failed to find evidence of a response generalization from the clinic skill acquisitions to home aggression reductions, but Grimes did not actively involve parents in reinforcing and prompting skill use in the home; hence, the earlier transition from SCRST (Grimes) to SCRST-PV ("Parent Version"; Babbitt, 2015). The current

project modified Grimes' direct child skill building approach to include Babbitt's (2015) parent-training component to yield the current SCRST-FV ("Family Version"). Together, the combined child skill building plus parent Help and Reinforce at home may have achieved both setting and response generalizations. Obviously, no firm conclusion can be drawn from the current data, given the lack of experimental controls. Nevertheless, the current project provides an empirical justification for implementing a more expensive, time-consuming randomized controlled trial.

Secondary Hypotheses

While potential setting and response generalizations were demonstrated on the SCRS-III and BRCs, generalization did not extend to all measures in the project. For example, siblings did not uniformly display a decrease in noncompliance from pre- to post-SCRST-FV. As shown in Table 9, only older siblings appeared to manifest the response generalization from a decrease in aggressive episodes to a decrease in other coercive behaviors, such as noncompliance. Younger siblings did not significantly decrease rates of noncompliance, although the effect was in the expected direction (pre $M = 3.8$; Post $M = 2.2$). Moreover, target siblings failed to exhibit changes in behavior on any of the five SPA codes (Table 11) or on parent ratings on the two CBCL dimensions (Table 12). These are all issues of treatment generalization, which could have occurred, but were not observed in the current project.

In addition to a lack of experimental control, the predicted generalization to reduced sibling aggression was also compromised by the limited range of measurements of aggression obtained during the project. For example, the observed reduction in sibling aggression might have been a function of siblings replacing physical aggression with more indirect/covert, aggressive behavior, rather than the use of conflict resolution skills. Historically, developmental psychologists have identified a normal, developmental transition in the expression of aggressive

behavior in school age children. Specifically, young children (pre-school age) typically display more physical aggression than their older school age counterparts. It has been hypothesized that as children develop, their verbal, conversational, and cognitive abilities improve, enabling a shift from overt, direct, physical aggression to more indirect, verbal aggression and/or relational aggression (Archer & Coyne, 2005; Björkqvist, Lagerspetz, & Kaukiainen, 1992). The current project did not measure or track other forms of aggressive behavior beyond physical aggression (i.e., verbal or relational aggression). Consequently, it is impossible to determine whether or not siblings replaced their reduced physical aggression with other forms of aggressive behavior.

Although small sample size and possibly low coding accuracy are both viable explanations behind the failure to observe the expected improvements in sibling play in the SPA, there are additional reasons for generalization failures when considering parent questionnaire data and home noncompliance frequencies. In the case of the CBCL parent ratings, the SCRST-FV could be far too narrow in scope to provoke changes in the two selected CBCL dimensions, which sample misconduct broadly and well beyond sibling aggression. Moreover, the CBCL dimensions evaluated in the current project do not measure sibling or peer skills at all. In the case of noncompliance in the home, the SCRST-FV does not provide parents with any of the specific strategies identified in the treatment literature to reduce noncompliance, such as instruction-giving, social reinforcement, warnings, and chair timeouts.

Tables 13 and 14 provide information on parent's perceptions of the SCRST-FV intervention in terms of utility (Table 13) and difficulty of skill implementation (Table 14). Ratings provided by all five completing families suggests that the each of the skills presented were at least "somewhat useful" (ratings above 5.0 on 7-point scale), on average. Over half of the skills were rated as "Useful" or approaching "Extremely Useful" by parents. Additionally,

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parents rated both the Help and Reinforcement components of the SCRST-FV as "somewhat easy" to implement at home. Together, it appears as if parents had positive impressions of the SCRST-FV, rating the sibling skills as useful and the parenting aspects of the intervention as effortful, but doable.

Limitations

As discussed above, the fundamental limitations of the current study are the lack of an experimental control condition and the very small sample size. Neither of these deficiencies are easily addressed. First, the recruitment of clinic-referred families seeking help for persistent sibling aggression proved to be quite difficult. Moreover, a significant subset of such referrals (6 in this project) failed to meet the joint eligibility requirements of high sibling aggression and low conflict resolution skills. Possibly, the recruitment of eligible referrals would be facilitated by a larger metropolitan catchment area. Second, the time and resources required to manage a randomized controlled trial of this nature are huge. External grant funding appears to be necessary. The SCRST-FV is very labor intensive. Unlike a typical family therapy session managed quite well by a single, licensed professional, the SCRST-FV as currently structured requires a primary therapist, two therapist's assistants, and an administrative assistant to videotape, code video tapes, and manage the immense amount of data yielded by the protocol, totaling a minimum of four, well-trained professionals.

Strengths

This study demonstrated that the SCRST-FV protocol is a viable intervention that warrants continued research. The SCRST-FV's parent training component, when combined with direct child skill building, was found to be associated with increased sibling social skill repertoires and decreased sibling aggression at home. The siblings recruited in this sample

improved their conflict resolution skills into the range consistent with previous research (i.e., Babbitt, 2015; Grimes 2014), providing evidence of replication. Generalization of these skills from clinic to home is evidenced by the subsequent decrease in aggressive episodes in the home. This project extends previous research (i.e., Grimes, 2014; Nakaha et al., 2016) by demonstrating that incorporating parent training with skill building might achieve setting generalization.

In addition, this project provides replication of previous studies and adds to an existing literature on parent-collected data using the BRC system. The BRC used in the current project was adapted from the system created by Nadler and Roberts (2013) and used by Grimes (2014) and Babbitt (2015). Clearly, the psychometric properties of BRC counts of sibling skill use (Table 7) and parent efforts to support those skills (Table 6) are unknown, but some knowledge about both processes was gained. Specifically, parents were willing and able to track sibling skill use in the home (accompanied by token and social reinforcement), as well as their own attempts to help siblings implement conflict resolution strategies. Moreover, parents rated this system as useful and feasible (Tables 13 and 14).

Future Directions

The Limitation section presented earlier offers directions for future research. That future appears to require significant external funding and time commitments from child clinical researchers. On a more optimistic note, the SCRST-FV as currently operationalized appears to be a viable intervention, despite the current inadequacy of experimental control and sample size. Given the serious nature of persistent sibling aggression and its direct involvement in externalizing disorders (Patterson, 1984), the SCRST-FV may eventually prove to be an important complement to traditional motivational strategies to reduce aggression. Unlike motivational approaches which do not address repertoire issues, the substitute skills for resolving

sibling conflicts can now be measured, learned in clinic settings, and displayed in the home via the SCRST-FV protocol. Parents appear to appreciate the SCRST-FV and are willing to implement the home requirements of the protocol. Only future research will be able to discern the strengths and weaknesses of the SCRST-FV as a stand-alone therapy and/or the eventual best combination of building skillful child repertoires, motivating skill use in home settings, and suppressing aggressive coercion through traditional forms of response cost, such as token fines and/or timeout.

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