Journal of Family Psychology
2015, Vol. 29, No. 3, 458–468

0893-3200/15/$12.00 http://dx.doi.org/10.1037/fam0000084

Fostering Parents' Emotion Regulation Through a Sibling-Focused Experimental Intervention

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In this study, we assessed whether an intervention designed to improve children's sibling relationships, the More Fun with Sisters and Brothers program (MFWSB), may also help parents manage their emotions more effectively. Families with at least 2 children between the ages of 4 and 8 years were randomly assigned to an intervention ($n = 50$) or wait-list control ($n = 34$) group. Parents completed pre- and posttest questionnaires on sibling warmth and agonism, their emotion regulation during sibling conflict, and their global emotion regulation styles. Program participation had a direct effect on 3 of the 4 emotion regulation outcomes for mothers. Mothers in the intervention versus control group reported lower levels of dysregulation and suppression and higher levels of reappraisal at posttest, controlling for pretest regulation scores. Additionally, path models examining posttest responses showed that participation in MFWSB led to lower levels of maternal and paternal negative reactivity in the sibling context via lower levels of sibling agonism, controlling for pretest levels of negative reactivity. Alternate path models, with parents' emotion regulation as mechanisms linking MFWSB and sibling relationship quality, were tested but not supported. Results highlight the value of a sibling-focused intervention for promoting parents' abilities to regulate their emotions.

Keywords: sibling relationships, parental emotion regulation, intervention, fathers

Being a parent of one child is well-recognized as emotionally challenging (Cowan & Cowan, 1993). The introduction of subsequent children into the family brings additional stressors and complexities to family life (Kojima, Irisawa, & Wakita, 2005; Stewart, 1990). In addition to meeting the needs of individual children, parents of siblings must guide and manage the interactions among their children. One likely contributor to the stress of raising siblings is how well children get along, including the level of sibling conflict, animosity, or rivalry (Kramer & Baron, 1995). Although the nature and impact of the demands associated with parenting siblings have not yet been systematically examined, it is likely that parents who have more difficulty addressing these demands, or who experience higher levels of stress, are less effective in their parenting (Kojima et al., 2005).

In this light, we tested whether an intervention designed to improve children's sibling relationships would also help parents manage their own emotions more effectively. The More Fun with Sisters and Brothers program (MFWSB) is an established and validated intervention that has led to improvements in sibling relationship quality among 4- to 8-year-old children (Kennedy & Kramer, 2008). In the current study, the parent education component of the MFWSB program was strengthened to prepare parents to help their children transfer learning of socioemotional competencies to the home and other contexts. Using a new sample, we investigated whether participation in MFWSB would foster emotion regulation among mothers and fathers, as their children engaged in more positive and fewer negative interactions. Few studies have addressed the role of fathers in sibling relationships, and we examined associations among intervention status, parental emotion regulation, and sibling relationship quality for both mothers and fathers.

Parents' Emotion Regulation in the Context of Sibling Relationships

Conflict occurs more frequently in sibling relationships than in other types of family relationships (Straus, Gelles, & Steinmetz, 2006) and is likely to be a salient stressor for parents (Stewart, 1990). Although empirical studies have linked familial stressors such as marital conflict to negative emotions in family members

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We are grateful to the families who participated in this research as well as to colleagues Genevieve Stasheff, Denise Kennedy, Mary Lynn Fletcher, and Brian Ogolsky. This article is based on work supported by the U.S. Department of Agriculture National Institute of Food and Agriculture, Hatch Project ILLU-793-364. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture.

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(Koss et al., 2011; Wong, McElwain, & Halberstadt, 2009), little attention has been devoted to how stress elicited by sibling agonism (i.e., negative interactions involving conflict and/or hostility) may affect parents. We turned to Dix's (1991) model of affective processes in parenting to conceptualize how sibling relationship quality may promote or hinder parents' emotion regulation in the sibling context. According to Dix, challenging interactions between parents and children are key factors that prompt activation of parents' emotions. Parents' emotions, in turn, have the potential to influence a variety of parent–child engagement processes as well as to shape parental cognitions and behaviors (also see Dix, Gershoff, Meunier, & Miller, 2004). Intense negative emotions may interfere with parents' effective regulation of their own emotions and ultimately hinder parents' ability to respond to their children in ways that are beneficial (Dix, 1991). Although Dix did not explicitly consider the challenges of parenting during instances of sibling conflict, we posit that sibling agonism may trigger high levels of negative emotional arousal in parents and lead to difficulties in regulating emotions, such that it hinders adaptive parenting.

Although investigations of parents' emotions with regard to sibling relationship quality are rare, Stocker, Ahmed, and Stall (2006) demonstrated that maternal self-reports of more negative emotional expressiveness in the family were related to greater hostility and rivalry in the sibling relationship. Similarly, Garner, Jones, and Miner (1994) found that when mothers reported higher levels of negative submissive emotions (e.g., sadness) in the family, their 4- and 5-year-old children engaged in lower levels of caregiving behavior toward younger siblings. In both studies, however, associations were correlational and assessed concurrently. Thus, it remains unknown whether mothers' expression of negative emotions precipitated negative sibling interactions or whether siblings' hostility and conflict precipitated maternal negative emotions. The association between parents' affective experiences in the sibling context and sibling relationship quality is likely to be reciprocal. Parents' negative arousal in response to sibling agonism may hamper their ability to respond adaptively to their children at these times, and may relate to lower levels of parenting self-efficacy (Coleman & Karraker, 1998). Less effective parenting, in turn, could have repercussions for the quality of children's sibling relationships. For instance, parents who avoid actively supporting their young children to help them resolve disagreements, perhaps because of their own experiences of negative arousal, tend to have children who interact more agonistically (Kramer, Perozynski, & Chung, 1999; Siddiqui & Ross, 2004; Smith & Ross, 2007).

In addition to agonism, the degree of warmth in the sibling relationship may have implications for parents' emotional regulation. Higher levels of sibling warmth have been associated with more supportive parenting and positive emotional expressiveness in the family for both preschool (Gamble & Yu, 2014) and school-aged (Brody, Stoneman, & McCoy, 1994) siblings. We would expect from Dix's (1991) model that parents may experience less negative arousal, and therefore, require less regulation of negative emotions, when their children demonstrate mutual closeness and affection, in contrast to conflict and agonism. Again, given the correlational nature of past findings, it is not known whether sibling warmth elicits positive emotional functioning in parents, or vice versa. It also important to note that warmth and agonism are distinct but related constructs and that sibling relationships can be characterized by both qualities to varying degrees (Dunn, 2007). Furthermore, instances of sibling warmth and conflict can occur in swift succession, leading Dunn to conceptualize children's sibling relationships as "ambivalent," comprised of both positive and negative forms of interaction and affect. Understanding that an instance of sibling conflict may soon be followed by warmth and engagement may facilitate parents' ability to regulate the negative emotions stimulated by sibling agonism. Thus, both sibling agonism and warmth hold potential as predictors of parents' emotional regulation.

Guided by Dix's (1991) model of affective processes in parenting, we investigated two aspects of parents' emotional functioning in the context of parenting siblings: emotional reactivity and emotional dysregulation. *Emotional reactivity* refers to the negative emotional arousal parents experience when their children are not getting along. Parents high on emotional reactivity would be expected to feel overwhelmed and upset when their children argue or fight. *Emotional dysregulation* refers to the extent to which parents experience difficulties in managing their arousal, such that their emotional experience interferes with effective parenting. Parents high on dysregulation would be expected to report difficulty in helping their children get along or solve problems during times of sibling conflict or strife. In the current study, we evaluated the degree to which parent-reported emotional reactivity and dysregulation decreased from pretest to posttest directly as a function of their family's participation in the intervention or indirectly as a function of their children's intervention-related gains in sibling relationship quality.

Parents' Global Emotion Regulation Strategies

In addition to investigating parents' emotional functioning in the context of parenting siblings, we considered two strategies that adults may use to regulate their emotions in a wide range of interpersonal contexts: cognitive reappraisal and expressive suppression (John & Gross, 2004). *Cognitive reappraisal* "involves changing the way the individual thinks about a potentially emotion-eliciting situation in order to modify its emotional impact" (p. 1302). *Expressive suppression*, on the other hand, "is a form of response modulation that involves inhibiting ongoing emotion-expressive behavior" where the aim is to shut down emotional expression (p. 1302). According to John and Gross, cognitive reappraisal is an antecedent-focused strategy that occurs early in the emotion-generative process and may help eliminate or alter both the behavioral and physiological aspects of the aversive emotion. In contrast, expressive suppression is a response-focused strategy that occurs later in the emotion-generative process, after the individual has experienced some level of physiological arousal.

Although we know of no research that has examined these global emotion regulation constructs in relation to parenting siblings, several findings suggest their potential significance. For instance, the consistent use of cognitive reappraisal among adults has been related to overall lower levels of negative emotion and depression, whereas the use of expressive suppression has been associated with higher levels of stress, negative emotion and depression, and lower levels of positive emotion (see Butler et al., 2003; Gross & John, 2003). Notably, a key focus of the MFWSB program involves teaching siblings to manage their emotions and

resolve conflicts effectively, for example, by reframing disagreements and arguments as problems that can be solved using a collaborative problem-solving process (Kennedy & Kramer, 2008; Kramer, Schell & Kramer, 2010). Therefore, we investigated whether participation in the intervention would be related directly or indirectly (via improved sibling relationship quality) to parents' increased use of reappraisal and decreased use of suppression from pretest to posttest.

The Current Study

Our main objective was to examine the efficacy of an established sibling intervention program, the MFWSB program (Kennedy & Kramer, 2008; Kramer et al., 2010), for improving parents' emotion regulation while also improving children's sibling relationship quality. MFWSB is a five-session preventive intervention in which small groups of children, aged 4 to 8 years, are taught six socioemotional competencies identified in previous research (e.g., Kramer & Gottman, 1992; Kramer & Kowal, 2005) as fundamental for prosocial sibling interactions: (a) initiating social interaction; (b) accepting and appropriately declining invitations to play; (c) perspective-taking; (d) identifying emotions; (e) regulating intense emotions; and (f) managing conflict. A parent education component helps parents apply the training gains to the home and other natural contexts. In previous evaluations of the program (Kennedy & Kramer, 2008), both observational and parent-report data indicated that siblings in a randomly assigned experimental group demonstrated more warmth, less agonism, and less rivalry after participation, whereas these factors remained stable for a waitlist control group.

We addressed two key questions. First, is participation in the MFWSB program directly related to improvements in parents' reactivity and dysregulation in the sibling context, as well as their use of global emotion regulation strategies? By observing their children learn and practice core emotion regulation skills taught in the program and by learning themselves how to guide their children to enact these skills at home, parents may become more aware and competent in managing their own emotions. Thus, we expected participation in MFSWB to be directly related to lower posttest levels of parents' reactivity and dysregulation in the sibling context along with more adaptive global emotion regulation strategies (i.e., greater reappraisal, lower suppression).

Second, is participation in the MFWSB program indirectly related to lower levels of reactivity and dysregulation in the sibling context and higher levels of optimal global emotion regulation strategies at posttest *via* its capacity to foster sibling warmth and reduce sibling agonism? Because the MFWSB program primarily targets the sibling relationship, we hypothesized that participation in the program would also have an indirect effect on parents' emotion regulation via improved sibling relationship quality. That is, we expected that the intervention would be related to greater sibling warmth and lower sibling agonism at posttest, which in turn would be related to lower parental reactivity, dysregulation, and suppression and higher reappraisal at posttest.

The design of the current study—an experimental intervention—offers advantages for examining the above questions. Random assignment of participants to intervention and control groups, and following these groups prospectively, increases confidence in causal inferences of effects of the intervention on sibling relationship quality (Kramer, 2004). This design also enables us to test if and how parents' emotion regulation strategies are modifiable and whether improvement in sibling relationship quality offers benefits to parents as well as children. Finally, the current study is unique in that it examines how changes in *children's* behaviors may precipitate changes in *parents'* behaviors and emotional experiences. Most prior research has conceptualized the opposite direction of effects, in which improved parenting promotes higher-quality sibling relationships (Siddiqui & Ross, 2004; Smith & Ross, 2007). The use of an experimental intervention and prospective assessments enabled us to test the direction of effects. Although we predicted that improved sibling relationships would foster parents' emotion regulation, we also tested a set of alternative models in which the MFWSB program was posited to have indirect effects on sibling warmth and agonism via parents' acquisition of more optimal emotion regulation (e.g., lower reactivity and dysregulation).

Method

Participants

Families were recruited through newspaper advertisements and flyers distributed to local preschool and child-care centers. Families who met the inclusion criteria of having at least two children between the ages of 4 and 8 years were randomly assigned to an intervention or wait-list control group. For the current report, we focused on 84 families ($n = 50$ for intervention group; $n = 34$ for wait-list control group) who provided posttest responses on at least one of the measures of interest. Eighty-two percent of mothers and 85% of fathers in the intervention group were European American, and 91% of mothers and 82% of fathers in the control group were European American. Parents from both groups reported an annual income that placed them in the middle class. No differences were found between the intervention and control groups with regard to the demographic variables assessed (see Table 1). We also compared our sample of 84 families with families not included ($n = 10$ total; 8 from the intervention group and 2 from the control group) because they failed to complete relevant posttest instruments. Of the 22 comparisons conducted on the pretest scores and family demographics, three were significant ($ps < .05$). Families included in the current sample were lower at pretest on maternal reactivity ($Ms = 16.84$ vs. 20.57), maternal dysregulation ($Ms = 19.10$ vs. 22.71), and paternal work hours ($Ms = 41.13$ vs. 52) than families not included.

Procedure

The study was implemented with approval by the university's institutional review board. Families in the intervention group were first visited in their homes 1 week before the beginning of the MFWSB program, and again, 1 week after the laboratory-based group sessions of MFWSB. At both home visits, parents completed a set of questionnaires while their children participated in a set of assessment activities in a separate room. Questionnaires tapped parents' emotion regulation in the sibling context, parents' global emotion regulation strategies, perceptions of sibling relationship quality, and demographic characteristics.

Table 1
Demographic Characteristics of Intervention (n = 50) and Wait-List Control (n = 34) Groups

Characteristics	Intervention group *N*	Wait-list control group *N*
Type of sibling dyad		
Brother-brother	10	7
Sister-sister	19	11
Older sister-younger brother	11	9
Older brother-younger sister	10	7
Older child birth order[a]		
Oldest sibling	44	27
Middle sibling	4	7
Younger child birth order[a]		
Youngest sibling	37	27
Middle sibling	11	7
Number of families with more than two children	14	12
	Mean (*SD*)	Mean (*SD*)
Child age (years)		
Older child	7.01 (1.09)	7.26 (1.11)
Younger child	4.80 (0.73)	4.85 (0.86)
Parents' age (years)		
Mothers	37.92 (4.45)	36.50 (5.08)
Fathers	39.91 (9.15)	40.09 (6.32)
Years married	10.90 (4.14)	11.14 (3.31)
Hours worked outside the home		
Mothers	22.16 (17.35)	21.77 (17.75)
Fathers	41.76 (9.88)	40.19 (15.81)
Parental years of education		
Mothers	17.54 (2.94)	17.00 (2.94)
Fathers	17.45 (3.25)	17.42 (3.52)

[a] Two sibling dyads in the intervention group were twins and are not included in the reports of birth order.

The MFSWB program was conducted in a research facility on the University's campus that was designed to resemble a family home. The four laboratory sessions occurred on a weekly basis and were administered to children in small groups so that siblings from three to four families participated together. In each 1-hr program session, children were taught each of the six targeted socioemotional competencies by two adult facilitators who used instruction, demonstrations, role-playing, coaching, and positive feedback. Parents observed each program session through a video monitoring system, and the senior researcher was present to explain how parents should support these skills at home. For example, parents received instruction on how to help children identify occasions in which the targeted skills could be used and how to prompt, coach, and reinforce the occurrence of the target skills in natural settings. To further extend learning to the home context, families were given a set of story books, board games, CDs, and activity books designed to encourage active parent participation in applying the competencies with their children. In addition, parents were provided with handouts that described in detail how they could further promote children's use of the socioemotional competencies in the home and other contexts such as in the car, at the grocery store, and while visiting friends and relatives. After the four laboratory sessions, each sibling dyad received a personalized 1-hr generalization training session in their home that enabled them to review, apply, and practice the targeted skills. Posttest measures were administered after the generalization training.

The procedure for families assigned to the waitlist control group was identical to that of the intervention group but these families did not participate in the MFWSB program until the end of data collection. After the initial home visit and data collection, control group families were simply told that there would be a wait until the next group of program sessions began. A second home visit was scheduled after 5 weeks to obtain an additional assessment of the sibling relationship before providing the intervention. Thus, pre- and posttest assessments were obtained from the control group at the same intervals as the intervention group.

Measures

Parents' emotion regulation in the sibling context. Given the lack of existing instruments to examine parents' emotional experiences and regulation while parenting siblings, the Parental Emotion Regulation in the Sibling Context Questionnaire was created to assess parents' perceptions of their emotional reactivity and dysregulation during agonistic sibling interactions. Dix's (1991) model of affective processes in parenting guided the construction of this instrument. Parents were presented with a list of 16 statements and asked to rate their level of agreement with each statement on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A Principal Components Analysis (PCA), with Varimax rotation, was conducted on the 16 items using mothers' and fathers' pretest responses, respectively. The PCA yielded a 5-factor solution that accounted for 69% (mothers) and 68% (fathers) of the variance. The majority of the items loaded on the first two factors (all loadings $\geq .44$), and we focused on these two factors in our analyses. The first factor accounted for 32% (mothers) and 38% (fathers) of the variance. Seven items loaded on this factor, labeled as *Dysregulation*, and tapped the degree to which parents felt that the emotions they experienced when their children were not getting along interfered with their ability to parent effectively (e.g., "It's really hard to be a good parent when I'm aggravated about my children's behaviors toward each other"). The second factor accounted for 13% (mothers) and 11% (fathers) of the variance. Five items loaded on this factor, labeled as *Reactivity*, which tapped the degree to which parents experienced negative emotions when their children were not getting along but a connection to parenting per se was not indicated (e.g., "When my children are not getting along, I become very upset"). Composite scores of dysregulation ($\alpha = .82$ and .86 for mothers, and .85 and .87 for fathers, at pre- and posttest, respectively) and reactivity ($\alpha = .86$ and .79 for mothers, and .88 and .89 for fathers) were created by summing ratings across subscale items.

Parents' global emotion regulation strategies. Parents completed the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), which assessed the degree to which parents generally utilize cognitive reappraisal and expressive suppression. The ERQ is a widely used measure of adult emotion regulation and has good test–retest reliability and high levels of validity (Gross & John, 2003). Parents were presented with 10 items describing cognitive reappraisal (6 items, e.g., "I control my emotions by changing the way I think about the situation I'm in") or expressive suppression (4 items, e.g., "I control my emotions by not expressing them") and were asked to rate each statement on a 7-point scale ranging

from 1 (*strongly disagree*) to 7 (*strongly agree*). Composites of cognitive reappraisal (α = .80 and .86 for mothers and .83 and .85 for fathers, at pre- and posttest, respectively) and expressive suppression (α = .70 and .86 for mothers and .73 and .89 for fathers) were created by averaging ratings across items.

Sibling relationship quality. Mothers and fathers also completed the Parental Expectations and Perceptions of Children's Sibling Relationships Questionnaire (PEPC-SRQ; Kramer & Baron, 1995). The PEPC-SRQ has been shown to have high levels of test–retest reliability and validity (Kramer & Baron, 1995). Parents were asked to rate how often a series of positive and negative behaviors occurred in the sibling relationship during the past 2 weeks on a 5-point scale ranging from 1 (*never*) to 5 (*always*). Two PEPC-SRQ subscales were used in this study: (a) *sibling warmth* (15 items, e.g., "comforting one another"; α = .91 and .93 for mothers and .88 and .91 for fathers, at pre- and posttest, respectively); and (b) *sibling agonism* (9 items, e.g., "threatening one another"; α = .86 and .87 for mothers and .86 and .88 for fathers). Subscale scores were created by summing across items. Mothers' and fathers' reports of sibling warmth were correlated at pretest, $r = .53$, $p < .001$ and posttest, $r = .48$, $p < .001$, as were reports of sibling agonism ($r = .53$, $p < .001$ at pretest; $r = .57$, $p < .001$ at posttest). Given the robust correlations between parents' reports, mothers' and fathers' scores for each subscale were averaged to create more reliable measures of sibling relationship quality.

Data Analytic Plan

To assess the direct and indirect effects of the intervention on parent emotion regulation outcomes, four path models were tested using Mplus 7.3 (Muthén & Muthén, 1998-2012). One path model was tested for each parental outcome (i.e., reactivity, dysregulation, reappraisal, and suppression at posttest). For a given outcome, mothers' and fathers' scores were examined in the same model, as this enabled us to account for family level interdependence between mothers' and fathers' emotional functioning. Further, both direct and indirect paths were tested in the same model. Specifically, direct paths from the intervention (intervention group = 1; control group = 0) to the parental outcomes (e.g., maternal and paternal reactivity) were tested. To test sibling warmth and agonism as mechanisms linking the effect of the intervention on the parental outcomes, paths were estimated from: (a) the intervention to posttest scores of sibling warmth and agonism, and (b) from sibling warmth and agonism to the mother and father outcomes. Pretest levels of emotion regulation were controlled in all models. Specifically, paths from mothers' and fathers' pretest emotion regulation scores to posttest sibling relationship quality and mothers' and fathers' posttest emotion regulation scores, respectively, were estimated (e.g., maternal pretest reactivity predicted posttest sibling agonism and warmth and maternal posttest reactivity, and paternal pretest reactivity predicted posttest sibling warmth and agonism and paternal posttest reactivity). Covariances between the error terms for: (a) sibling warmth and sibling agonism, and (b) mothers' and fathers' emotion regulation outcomes in a given model were also estimated. The comparative fit index (CFI) and root-mean-square error of approximation (RMSEA) were examined to assess model fit. CFI values of .95 and above indicate a good fit (Hu & Bentler, 1995). RMSEA values less than .05 indicate a good fit (Browne & Cudeck, 1993).

Mplus allows for tests of *specific* indirect effects (e.g., from intervention to maternal dysregulation via sibling agonism) when multiple mediators are examined. Further, because traditional z tests of indirect effects may be biased because of the nonnormal distribution of the indirect effect when the null hypothesis is false, we used the bias-corrected bootstrap method as recommended by MacKinnon, Lockwood, and Williams (2004). This method is a resampling technique that corrects for bias in the central tendency of the estimate of the indirect effect. Thus, via the bootstrap procedure in Mplus, we utilized bias-corrected confidence intervals (CI_{bc}) to assess indirect effects and we specified 5,000 replications for the bootstrap procedure. An indirect effect was considered significant if the confidence interval did not include 0. We estimated intervals at 95% ($p < .05$) and 99% ($p < .01$) confidence levels.

To account for missing data, full-information maximum likelihood (FIML) estimation was used. FIML utilizes all data available and provides less biased estimates compared with other methods such as listwise deletion (see Schafer & Graham, 2002). Data were missing completely at random (MCAR) for 28 families because the emotion regulation measures were added after the second series of sessions had begun. One advantage of MCAR data over other types of missing data (e.g., "missing not at random") is that estimated parameters are not biased because the missingness is a random sample of cases that do not depend on any observed variable (Schafer & Graham, 2002). Families missing versus not missing parent emotion regulation data were compared on all demographic and sibling relationship measures at pre and posttest. As would be expected with MCAR data, all 16 comparisons conducted were nonsignificant. Because FIML was used, the sample size was 84 for each path model tested.

Results

Preliminary Analyses

Means and SDs for all study variables at pre- and posttest are shown in Table 2, and intercorrelations among the study measures are shown in Table 3. The pretest intercorrelations are shown below the diagonal, the posttest intercorrelations are shown above the diagonal, and the intercorrelations between pre- and posttest measures of the same variables are shown on the diagonal. The intervention and control groups were compared on pretest measures of sibling relationship quality and parent emotion regulation to assess whether the two groups were equivalent before the intervention. All comparisons were nonsignificant.

To replicate prior findings of the effectiveness of the MFWSB program in improving sibling relationship quality (Kennedy & Kramer, 2008), a series of 2 (Group: Intervention, Control) × 2 (Time: Pretest, Posttest) repeated measures analyses of variance were computed for the measures of sibling relationship quality. The main effects of group and time on sibling warmth were nonsignificant, although a significant Group × Time interaction emerged: parents in the intervention group reported increased sibling warmth from pre- to posttest, whereas parents in the control group reported consistent levels of warmth at the two time points, $F(1, 83) = 35.40$, $p = .02$ (see Table 2 for Means). With respect

Table 2
Descriptive Statistics for the Measures of Parent Emotion Regulation and Sibling Relationship Quality for the Intervention (n = 50) and Wait-List Control (n = 34) Groups

	Intervention group				Wait-list control group			
	Pretest		Posttest		Pretest		Posttest	
Variable	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Mothers								
Reactivity	16.33	2.87	17.00	2.91	17.15	3.16	16.98	2.65
Dysregulation	18.67	4.22	16.19	3.96	19.39	3.79	18.88	4.67
Reappraisal	4.95	0.77	5.50	0.88	5.08	0.94	4.96	1.06
Suppression	2.62	0.83	2.52	0.76	2.87	1.00	2.95	1.20
Fathers								
Reactivity	16.17	3.37	15.75	3.44	16.76	3.68	16.19	3.89
Dysregulation	19.24	4.15	18.66	3.49	16.68	3.72	19.29	5.68
Reappraisal	4.62	0.94	4.81	1.14	4.83	1.00	4.89	0.89
Suppression	3.81	0.85	3.70	1.16	3.57	1.12	3.80	1.42
Sibling relationship								
Warmth	48.04	6.81	49.51	7.26	49.46	5.15	48.73	6.47
Agonism	26.75	4.23	23.65	3.34	27.51	4.10	26.56	4.51

to sibling agonism, the main effect of group was nonsignificant. However, the main effect of time on sibling agonism was significant, $F(1, 83) = 30.22$, $p < 001$, which was qualified by a significant Group × Time interaction: parents in the intervention group reported decreased sibling agonism from pre- to posttest, whereas reports of agonism remained stable for the control group, $F(1, 83) = 8.41$, $p = .01$.

Tests of Direct and Indirect Effects of the Intervention on Parents' Emotion Regulation

Tests of the four path models all indicated excellent fit: RMSEA = .00 to .05, CFI = .99 to 1.0. For each model, the χ^2 test of model fit was nonsignificant, which also indicated that each model fit the data well. Unstandardized and standardized path estimates for each model are reported in Table 4.

For the model predicting maternal and paternal reactivity in the sibling context, direct effects of the intervention were nonsignificant, yet significant indirect effects emerged via sibling agonism (see Figure 1a). Children in the intervention versus control group were lower on sibling agonism at posttest, and lower sibling agonism, in turn, was related to less maternal and paternal reactivity at posttest. Indirect effects of the intervention on mothers' reactivity (estimate: −.41; 99% CI_{bc}: −1.391 to −.003) and fathers' reactivity (estimate: −.65; 99% CI_{bc}: −1.899 to −.164) via sibling agonism were significant. Thus, controlling for pretest levels of reactivity, the intervention was associated with lower levels of maternal and paternal reactivity via its effect on lowering sibling agonism. Greater sibling warmth at posttest was related to less paternal, but not maternal, reactivity. Indirect effects of the intervention on mothers' and fathers' reactivity via sibling warmth, however, were nonsignificant.

For the model predicting maternal and paternal dysregulation in the sibling context (see Figure 1b and Table 4), a significant direct effect of the intervention on maternal (but not paternal) dysregulation emerged. Controlling for pretest dysregulation, mothers in the intervention versus control group reported lower levels of dysregulation at posttest. Children in the intervention versus control group also showed lower levels of sibling agonism at posttest, although the paths from sibling agonism to maternal and paternal dysregulation were nonsignificant. Although the path from inter-

Table 3
Correlations Among Maternal and Paternal Emotion Regulation and Sibling Relationship Quality at Pre- and Posttest

	1	2	3	4	5	6	7	8	9	10
1. M reactivity	**.58****	.30*	−.24	.05	.34*	.34*	−.18	−.09	−.29*	.42**
2. M dysregulation	.28*	**.59****	−.28*	−.38*	.22	.26	.15	.14	−.14	.39**
3. M reappraisal	−.25	.31*	**.59****	−.10	−.25	−.16	.19	.05	.19	.16
4. M suppression	.18	.13	.11	**.55****	.11	.09	.14	.16	−.01	−.03
5. F reactivity	.02	.32*	−.21	.21	**.72****	.76**	−.12	.01	−.65**	.54**
6. F dysregulation	.12	.31*	−.14	.09	.60**	**.78****	−.31**	.00	−.66**	.52**
7. F reappraisal	−.30*	−.19	.12	.07	−.27	−.35*	**.65****	.34*	.17	−.02
8. F suppression	−.21	.19	−.13	−.11	−.13	.08	−.01	**.80****	.09	.05
9. Sibling warmth	−.34*	−.31*	.12	.13	−.52**	−.60**	.19	−.10	**.81****	−.39**
10. Sibling agonism	.60**	.45**	−.02	−.01	.24	.44**	−.20	−.07	−.45**	**.66****

Note. M = mothers; F = fathers. Intercorrelations among pretest measures are below the diagonal, intercorrelations among posttest measures are above the diagonal, intercorrelations between pre- and posttest measures of the same variables are reported on the diagonal.
* $p < .05$. ** $p < .01$.

Table 4
Unstandardized and Standardized Path Coefficients for the Models Testing Direct and Indirect Effects of the Intervention on Posttest Mother and Father Emotion Regulation (ER; N = 84 Families)

	Parental emotion regulation (ER) outcomes at posttest							
	Reactivity		Dysregulation		Reappraisal		Suppression	
Paths estimated	*B* (*SE*)	β	*B* (*SE*)	β	*B* (*SE*)	β	*B* (*SE*)	β
Intervention → Mothers' ER (post)	−.10 (.66)	−.02	−2.1 (1.0)	−.22*	.58 (.23)	.28**	−.51 (.26)	−.24*
Intervention → Fathers' ER (post)	.67 (.71)	.08	−.89 (.91)	.08	.10 (.25)	.05	−.25 (.27)	−.09
Intervention → Sibling warmth (post)	.30 (1.3)	.02	1.8 (1.3)	.13	.87 (1.5)	.06	.75 (1.5)	.05
Intervention → Sibling agonism (post)	−2.7 (.77)	−.32***	−3.3 (.73)	−.39***	−3.0 (.85)	−.36***	−2.9 (.85)	−.35***
Mothers' ER (pre) → Mothers' ER (post)	.47 (.12)	.53***	.65 (.12)	.62***	.69 (.12)	.59***	.65 (.13)	.57***
Mothers' ER (pre) → Sibling warmth (post)	−.53 (.25)	−.26*	.00 (.21)	.00	.59 (1.2)	.07	.26 (1.1)	.04
Mothers' ER (pre) → Sibling agonism (post)	.35 (.14)	.29**	.22 (.10)	.24*	.09 (.58)	.02	.18 (.56)	.04
Fathers' ER (pre) → Fathers' ER (post)	.49 (.12)	.49***	.70 (.12)	.60***	.63 (.12)	.62***	1.0 (.12)	.80***
Fathers' ER (pre) → Sibling warmth (post)	−1.0 (.18)	−.58***	−.92 (.17)	.62***	.39 (1.2)	.05	.76 (1.2)	.12
Fathers' ER (pre) → Sibling agonism (post)	.37 (.12)	.35***	.42 (.09)	.47***	−.63 (.60)	−.14	−.06 (.58)	−.02
Sibling warmth (post) → Mothers' ER (post)	−.04 (.05)	.08	−.03 (.07)	−.04	.03 (.02)	.15	−.03 (.02)	−.17
Sibling agonism (post) →Mothers' ER (post)	.16 (.08)	.21*	.12 (.13)	.10	−.01 (.03)	−.04	−.05 (.03)	−.20
Sibling warmth (post) → Fathers' ER (post)	−.16 (.07)	−.28*	−.27 (.08)	−.34**	.02 (.03)	.18	.01 (.02)	.03
Sibling agonism (post) → Fathers' ER (post)	.24 (.10)	.25**	.05 (.12)	.04	.03 (.03)	.15	.02 (.03)	.05

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

vention to sibling warmth was nonsignificant, greater sibling warmth at posttest was related to less paternal, but not maternal, dysregulation. All indirect effects of the intervention on maternal and paternal dysregulation were nonsignificant.

For the models predicting parents' global emotion regulation strategies, significant direct effects of the intervention emerged for maternal reappraisal and suppression, respectively (see Table 4). Controlling for pretest levels, mothers in the intervention versus control group reported using higher levels of reappraisal and lower levels of suppression at posttest. The direct effects of the intervention on paternal reappraisal and suppression were nonsignificant. The effect of the intervention on sibling agonism was significant, although neither sibling warmth nor agonism was related to mothers' and fathers' reappraisal and suppression, and the indirect effects of the intervention on reappraisal and suppression were also nonsignificant.

Follow-Up Analyses of Mother–Father Differences in Associations

Because the paths from sibling warmth to parents' reactivity and dysregulation were significant for fathers and not mothers, follow-up analyses were conducted to test whether the correlations between posttest sibling warmth and posttest parental reactivity and dysregulation, respectively, differed significantly for mothers and fathers. Tests of dependent correlations (Steiger, 1980) revealed significant mother-father differences in the warmth-reactivity associations (rs = −.65 vs. −.29, fathers and mothers, respectively; $z = 2.37$, $p = .02$) and warmth-dysregulation associations (rs = −.66 vs. −.14; $z = 3.00$, $p = .003$), such that sibling warmth was related to less reactivity and dysregulation more strongly for fathers than for mothers. Parallel tests of mothers' versus fathers' agonism-reactivity and agonism-dysregulation associations at posttest (see Table 3 for correlations) were nonsignificant.

Tests of Alternate Directions of Effect

The path models reported above provide partial support for the hypothesis that the MFWSB program has a positive effect on parents' emotional functioning (specifically, maternal, and paternal reactivity in the sibling context) through its effect on lowering sibling agonism. However, the opposite direction of effect is also possible. To examine whether the intervention had an indirect effect on sibling relationship quality via improvements in parents' emotion regulation, four alternate path models were tested. For each measure of parental emotion regulation, paths were tested from: (a) the intervention to mothers' and fathers' posttest emotion regulation scores; and (b) mothers' and fathers' emotion regulation scores to posttest sibling warmth and agonism. Further, direct paths from the intervention to sibling warmth and agonism, as well as covariance parameters between the error terms of the emotion regulation variables (and the sibling variables), were estimated. Pretest sibling warmth and agonism were included as covariates. For all four alternate models tested, the indirect effects were nonsignificant.

Discussion

We investigated whether participation in the MFWSB program directly improved parents' emotion regulation as well as whether MFSWB participation was indirectly related to parents' emotion regulation via its effect on sibling relationship quality. For mothers only, participation in MFWSB was *directly* associated with lower posttest levels of dysregulation and expressive suppression and higher posttest levels of cognitive reappraisal. Further, for both mothers and fathers, MFWSB participation was *indirectly* associated with lower levels of parental reactivity in the sibling context via reductions in sibling agonism. Our confidence in the reliability of these findings is strengthened by the use of an experimental intervention, within a rigorous randomized control design, in which tests of alternate directions of effect were also conducted.

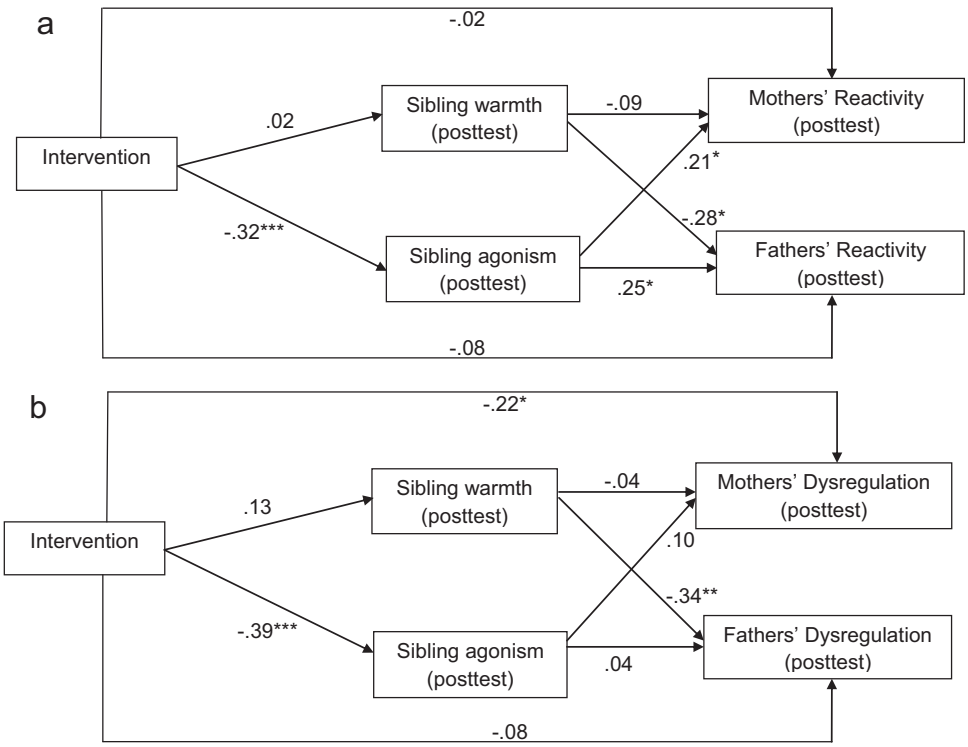

Figure 1. Sibling warmth and agonism as mediating mechanisms linking the intervention and mothers' and fathers': (a) reactivity and (b) dysregulation, controlling for pretest levels of reactivity and dysregulation, respectively. Intervention group = 1; wait-list control group = 0. Standardized path estimates are shown. In the above model, covariance parameters between: (a) sibling warmth and agonism, and (b) maternal and paternal emotion regulation (at both pretest and posttest), were each estimated but are not shown. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Below we discuss findings for direct effects of the intervention, followed by a discussion of indirect effects.

MFWSB participation was directly related to mothers' (but not fathers') use of the global emotion regulation strategies of more cognitive reappraisal and less expressive suppression. By observing MFWSB sessions and implementing program concepts with their children at home, mothers may have incorporated these competencies into their own emotion regulation repertoires. For instance, rather than viewing sibling agonism as problematic, the MFWSB program encourages parents to reframe agonism as a normative aspect of the sibling relationship that, although unpleasant, can have positive developmental effects (Bedford, Volling, & Avioli, 2000), such as providing children with opportunities to develop conflict management and emotion regulation skills (Kramer, 2014). These direct experiences in reframing sibling agonism as a surmountable challenge may have also promoted mothers' increased use of cognitive reappraisal and decreased use of expressive suppression more globally. Similarly, MFWSB participation was directly associated with reduced maternal dysregulation at posttest. Dysregulation refers specifically to the extent to which parents feel their emotions interfere with their parenting effectiveness during challenging moments of sibling conflict and agonism. Again, it is possible that mothers' adoption of strategies taught in the program to manage sibling agonism may have contributed to mothers' experience of fewer emotional disturbances in parenting when their children were not getting along.

The above direct effects of the intervention emerged for mothers but not fathers. It is possible that fathers practiced the targeted emotion regulation competencies less often with their children, thereby limiting their incorporation of these strategies into their emotion regulation repertoire. On the whole, mothers tend to be more involved in child rearing activities and take on more managerial responsibility with regard to parenting compared with fathers (McBride & Mills, 1993; Parke, 2002). We suspect that because of their greater availability to their children and their greater reliance on child-centered strategies that aim to help children achieve mutually beneficial outcomes to sibling conflicts (Kramer et al., 1999), mothers in the current study may have taken a more active role in coaching children (beyond MFWSB sessions) in the social-emotional skills taught via the intervention.

Turning to the findings for indirect effects, participation in MFWSB was related to lower levels of maternal and paternal reactivity *via* lower levels of sibling agonism. Thus, the tendency for parents to experience intense negative emotions during agonistic sibling interactions was reduced as their children learned to get along better. Dix (1991) posited that challenging moments between parents and children are key factors that trigger heightened negative emotional arousal in parents, which in turn may interfere with adaptive parenting behaviors. In line with this conceptual framework, our findings suggest that sibling agonism may act as a trigger for parents' experience of heightened negative emotions. Similarly, these results are in line with prior findings

indicating that parents perceive the frequent occurrence of sibling agonism to be problematic (Kramer & Baron, 1995). As such, our study supports and extends Dix's model by demonstrating its applicability to the specific context of parenting siblings.

The indirect effects of MFWSB on parental reactivity could be because of two or more nonmutually exclusive processes. A reduction in the *quantity* of sibling agonism through MFWSB participation may simply lead to less reactivity for parents. That is, parents are less likely to become emotionally aroused when children have fewer conflicts. Alternately, improvements in the *quality* of their children's relationship that are fostered by MFWSB could lessen parents' reactivity. Previous evaluations of MFWSB suggest that participation helps siblings learn perspective-taking skills and effective ways of managing emotionally charged encounters (Kennedy & Kramer, 2008; Kramer et al., 2010). Thus, siblings who participated in MFWSB may have adopted fundamentally different strategies to manage disagreements, which may lessen parents' emotional reactivity. Furthermore, parents who feel more efficacious in their parenting are less likely to experience negative emotions (Coleman & Karraker, 1998). As parents learned how to facilitate and reinforce the MFWSB's set of core socioemotional skills with their children, parents' sense of confidence or self-efficacy in effectively managing sibling agonism may have increased, thereby mitigating their experience of negative emotions when sibling conflict did arise.

The current results replicated those of previous evaluations of MFWSB in demonstrating that participation in MFWSB led to higher levels of sibling warmth and lower levels of agonism (Kennedy & Kramer, 2008). However, for both mothers and fathers, the effect of MFWSB on parents' emotional reactivity emerged via sibling agonism but not sibling warmth. Additionally, when agonism and warmth were examined together in the same path model, the effect of the intervention on sibling warmth was nonsignificant. Notably, however, greater posttest sibling warmth predicted less posttest reactivity and dysregulation for fathers only, and follow-up analyses indicated that associations between greater sibling warmth and lower levels of reactivity and dysregulation were stronger for fathers than mothers. This pattern of findings suggests that sibling warmth may play a special role in promoting fathers' emotional regulation in the sibling context. Because fathers tend to play more frequently with their children and engage in more vigorous rough-and-tumble and social play than do mothers (Parke, 2002), fathers may have increased opportunities to observe warmth when it is expressed among their children. In turn, fathers who observe high levels of warmth in their children's relationships may be better able to manage their own negative emotions when their children do engage in conflict, perhaps because they anticipate that the conflict will be successfully managed by their children or that, within limits, the sibling bond is strong enough to withstand conflict.

Whereas previous research on parenting and sibling relationship quality has largely been correlational (Garner et al., 1994; Stocker et al., 1997) or has presumed the direction of effects to be from parents to children, our study makes a unique contribution by investigating two plausible but competing directions of effect. The examination of alternate path models indicated that MFWSB did not affect sibling relationship quality via improvements in parental emotion regulation, in either the sibling context or more globally. Although the null findings for the alternate models were in line with our hypotheses, it is important for future research to examine the circumstances under which parents' difficulties in regulating negative emotions may hinder the quality of their children's sibling relationship. Longitudinal research, with multiple follow-up assessments, is needed to advance our understanding of the reciprocal child, parent, and family dynamics that best support sibling relationships over time.

Given the relatively high level of stress parents report related to rearing siblings (Kojima et al., 2005; Stewart, 1990) and the high frequency of sibling conflict reported by parents (Straus et al., 2006), it is likely that left unchecked, such stress may diminish parents' ability to reason and think logically about how to best respond to sibling strife. We now have a new instrument—the Parental Emotion Regulation in the Sibling Context Questionnaire—that may be used to assess mothers' and fathers' emotional experiences in the context of parenting siblings. As a new instrument, information on its psychometric properties is limited to the current report, in which a principal components analysis yielded two meaningful and internally consistent factors that emerged for both mothers' and fathers' reports. Preliminary support for the instrument's construct validity comes from its associations with the well-validated ERQ (Gross & John, 2003). Specifically, parents who reported greater dysregulation in the sibling context also tended to report lower levels of cognitive reappraisal—an adaptive global emotion regulation strategy assessed via the ERQ. We anticipate that future use and evaluation of our new instrument will lead to both refinements in its content and clarification of its optimal use for assessing parental emotion regulation in the sibling context. For example, it will be important to test its utility for capturing the emotional experiences of parents who are raising siblings of varying developmental levels and characteristics, age spans, and levels of expressed sibling agonism and warmth.

Our study is not without limitations. First, our sample was predominantly European American and middle class and thus, our findings cannot be generalized to families of different racial, ethnic, or socioeconomic backgrounds. The occurrence of sibling conflict and support has been shown to vary dramatically across cultural and ethnic contexts (McHale, Updegraff, & Whiteman, 2012; Weisner, 1989), which could differentially influence parent emotion regulation outcomes. In a similar vein, our sample consisted of families in which children engaged in relatively normative levels of sibling conflict as reported by parents. Participating mothers also reported significantly lower pretest levels of emotional reactivity and dysregulation compared with mothers who left the study prematurely. Thus, future research should include more diverse samples and assess the degree to which the current findings may generalize to families with more extreme levels of sibling conflict or maternal emotional disturbance.

In addition, this study relied on parental reports for indices of sibling relationship quality and parents' emotion regulation. Although the benefits of the MFWSB program on sibling relationships have been previously established using observational assessments as well as parent reports (Kennedy & Kramer, 2008), we focused here on parental reports for two reasons. First, parents were not present during the observations of sibling interaction that were conducted, and sibling interaction when parents are absent may differ substantially from when parents are present (Dunn, 2007; Kramer & Gottman, 1992). Second, parents' emotional reactivity and ability to regulate their emotions may be more

sensitive to their overall perceptions of how their children get along rather than their children's behavior in a brief videotaped interaction that occurred beyond their view. We aimed to minimize shared method variance in assessing associations between sibling relationship quality and parents' emotion regulation by creating composites of the sibling variables using the combined reports of mothers and fathers. Still, the use of multiple measures of key constructs is needed in future research. Observational methods, in particular, could be used in conjunction with parental reports to replicate and extend the current findings. For example, parents' self-reports of emotion regulation could be examined in tandem with observations of their responses to naturally occurring sibling conflict to reveal the ways in which parents' emotion regulation are associated with disruptive or ineffective parenting.

Finally, although at least one parent always observed each of the MFWSB sessions, we lacked systematic data on the number of sessions that mothers and fathers each attended. Informal observations suggested that mothers were more likely to attend sessions. It is possible that mothers took a more active role in coaching children than fathers, which could be one reason that direct effects emerged only for mothers. Future intervention studies should examine whether levels of parental participation may differentially affect mothers' and fathers' outcomes.

Despite these limitations, our study makes important contributions to both theory and practice. On the theoretical level, our results support the further development of Dix's (1991) model of affective processes in parenting to incorporate the experiences of parents caring for multiple children and tasked with fostering good relationships among siblings. Our experimental intervention enabled us to explore causal links between constructs and to test whether processes were modifiable. In addition to helping children get along better, interventions such as MFWSB may benefit families by increasing parents' use of adaptive emotion regulation strategies.

With respect to practice, the results of this study suggest that strategies that improve sibling relationship quality may also function to help parents manage the deleterious emotions they experience when their children engage in sibling conflict. Family clinicians, therefore, may work to reduce family stress associated with sibling conflict by promoting parents' awareness of their own emotional reactions during sibling conflict and facilitating parents' use of cognitive reappraisal strategies to, within limits, view sibling conflict as a normative interpersonal event that can be successfully managed. Additionally, clinicians might directly intervene at the level of the sibling dyad to foster siblings' effective management of conflict and thereby attenuate the potential of these events to trigger parents' negative reactivity. Thus, in light of the findings from this investigation combined with prior literature that underscores the potential influence the sibling relationship has on the whole family system (see Caspi, 2011), greater attention to sibling relationship dynamics as a point of intervention may be a productive avenue for family clinicians and parent educators.

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Received July 8, 2014
Revision received January 4, 2015
Accepted March 16, 2015 ■