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Training Early Childhood Educators to Promote Peer Interactions: Effects on Children's Aggressive and Prosocial Behaviors

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Research Findings: This study examined the effects of educators' participation in an in-service training program on the aggressive and prosocial behaviors of preschool-age children. Seventeen early childhood educators were randomly assigned to experimental and control groups. A total of 68 preschool children, 4 from each educator's classroom, also participated. The educator-child play groups included boys and girls. Educators in the experimental group received in-service training on how to facilitate peer interaction; educators in the control group received training on adult-child dyadic interaction strategies. Videotaped interactions of small-group play were coded to capture the frequency of children's use of aggressive and prosocial behaviors. Decreases in aggressive behaviors were found for boys but not for girls. Compared to the control group, the children in the experimental group used significantly more prosocial behaviors following the in-service training. Follow-up studies measuring the stability of decreases in aggression for boys and increased prosocial behaviors have yet to be conducted. *Practice or Policy:* In-service training for educators that focuses on promoting peer interactions improves children's use of prosocial behaviors during dramatic play in small-group interactions.

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Peer aggression is a problematic behavior, and its occurrence in child care settings impacts negatively on children and on the curricular goals of the classroom (Miles & Stipek, 2006). As a result, an important agenda for early childhood educators is to increase preschoolers' positive peer interactions while simultaneously decreasing the occurrence of maladaptive aggressive behaviors. Training educators to use strategies that promote positive peer interactions and reduce disruptive behaviors may contribute to successful transitions during class time and may create a positive classroom environment for both the children and the educators (Alvarez, 2007). Therefore, the purpose of the current study was to explore whether an in-service education program designed to facilitate positive peer interactions would reduce the aggressive behaviors and increase the prosocial behaviors of preschool children during small-group play interactions.

Preschool aggression can take various forms, including relational, physical, or verbal aggression. The current study focuses on physical and verbal aggression used by preschoolers in small-group interactions because these two forms of aggression have been shown to occur most frequently in toddlers and preschool-age children (Tremblay, Gervais, & Petitclerc, 2008). Developmentally speaking, physical and verbal aggression peak by the age of 3 and typically decline by the age of 5 as young children gain higher level skills in language development, perspective taking, and emotional regulation, which help to control aggression (Tremblay et al., 2008).

However, children's sustained use of aggressive behaviors during early childhood increases the risk that these negative behaviors may stabilize across time if no corrective interventions are used to address them (Persson, 2005). Longitudinal studies suggest that early and sustained aggression by children may result in long-term use of maladaptive behaviors and negative outcomes for both the aggressor and the victim (Barker et al., 2008; Olson, 1992; Tremblay et al., 2008). These outcomes may include depression, anxiety, social isolation, low self-esteem, self-harm, an increase in school absences, and decreases in school performance (Barker et al., 2008; Olson, 1992; Tremblay et al., 2008). Given its early onset and the link between aggression and later social-emotional difficulties, early childhood educators are well placed to address this behavior by promoting children's use of alternative, prosocial strategies during peer interactions.

Children's use of prosocial behaviors with their peers serves to enhance their social status within the group, and this may in turn operate as a protective factor against future peer rejection (Coie & Kupersmidt, 1983; Crick, Casas, & Mosher, 1997; Ladd, Price, & Hart, 1988). In addition, children with higher levels of prosocial behaviors typically engage in lower levels of

aggression and will experience less peer rejection overall (Crick et al., 1997; Dodge, 1983). Thus, the long-term use of prosocial behaviors may facilitate positive peer interactions, greater peer acceptance, and higher social status in the peer group (Coie & Kupersmidt, 1983; Crick et al., 1997; Dodge, 1983; Ladd et al., 1988).

A common approach to curbing aggression in young preschoolers focuses on teaching them to use prosocial behaviors. Classroom-wide strategies to promote prosocial behaviors include the manipulation of the physical environment to incorporate small-group play/learning centers (Weitzman & Greenberg, 2002) and direct skills training, in which children engage in small-group discussions that explicitly teach positive play strategies (Brown, Odom, & Conroy, 2001). Individual intervention strategies that promote prosocial behaviors include verbal scaffolds that educators can use with children throughout the day (e.g., prompting cooperative play, redirecting children to ask their peers for help, or alerting children to similarities that exist among each other) (Girolametto, Weitzman, & Greenberg, 2004; Kemple, David, & Hysmith, 1997; Schuele, Rice, & Wilcox, 1995).

The current study is unique because it targeted early childhood educators working in child care centers and taught them how to promote the prosocial behaviors of all of the children in their classroom, including those who may be at risk for social difficulties. Most widely used programs target children at high risk for conduct disorders or those with identified behavioral problems and use multilevel programming that provides training to the teacher, parent, and child simultaneously. Two multilevel programs that have evidence to support their efficacy are *The Incredible Years* (Webster-Stratton, Reid, & Stoolmiller, 2008) and *Fast Track* (Lavalley, Bierman, Nix, & The Conduct Problems Prevention Research Group, 2005; Slough, McMahon, & Conduct Problems Prevention Research Group, 2008). Both of these interventions focus on the dual goals of promoting social competence (i.e., the ability to behave appropriately in social situations) and reducing disruptive behaviors, including aggression. Outcomes of participation in *The Incredible Years* during one academic year included a reduction in children's aggressive behavior accompanied by increases in their social competence, school readiness, academic success, and positive peer interactions relative to a control group (Webster-Stratton et al., 2008). Similarly, participation in *Fast Track* has shown positive longitudinal outcomes for children's social-emotional development, behavioral change, and academic success relative to a control group (Lavalley et al., 2005; Slough et al., 2008). It is important to note that this latter program has a high per-child cost (i.e., USD \$5,828 per year; Slough et al., 2008), which places it beyond the reach of most child care centers.

Other models that facilitate the development of children's social competence have focused on in-service training for teachers and/or early childhood educators. Second Step is a prevention program that trains teachers to use three specific strategies to reduce aggression and increase prosocial behaviors in peer interactions (Frey, Hirschstein, & Guzzo, 2000). Teachers learn to use didactic lessons, role plays, and group discussions that focus on empathy, reducing aggression, and problem-solving strategies for aggressive behaviors. The results of several studies using this model have shown moderate reductions in children's aggressive behaviors relative to control groups over the duration of a school year (Frey et al., 2000; Persson, 2005; Slough et al., 2008). Similarly, Fostering Peer Interaction in Early Childhood Settings (Greenberg, 2005), the in-service education program used in this study, is designed to teach early childhood educators how to use verbal strategies to support positive peer interactions. Unlike Second Step, this program does not use child-directed lessons or role plays that are explicitly designed to teach children positive social skills. Rather, it teaches educators to use verbal strategies that can be implemented "on the fly" to scaffold positive peer interactions within small-group play contexts.

In-service education for early childhood educators has the potential to enhance child care by facilitating the transfer of evidence-based knowledge to the practice setting. It provides early childhood educators, who may have restricted access to professional development, an opportunity to fine-tune their skills or acquire new skills. Theoretical models of adult education suggest that key elements in developing professional development for educators should include engagement, self-reflection, and modeling of behaviors (West-Burnham & O'Sullivan, 1998; Wilson, 2004). These elements were important features of the in-service program used in the current study, which included four workshops for educators that taught practical information through discussion, role play, and participative lectures. In addition, all educators had three individual center visits to help them apply the new information to the classroom setting, with coaching and feedback from the instructor to enable continuous improvement.

This study was undertaken to examine the effects of Fostering Peer Interaction in Early Childhood Settings (Greenberg, 2005) on children's use of aggressive and prosocial behaviors in small-group activity centers. The conceptual model of the in-service program used in this study views educators as mediators of children's developmental progress. Theoretically speaking, the premise that adults (e.g., educators, parents) can influence children's acquisition of social skills finds support in Vygotskian theory, which asserts that adult-child interactions provide cultural and social guidance that mediates children's development of thinking and problem solving (Rogoff, 1990; Vygotsky, 1978). Learning to use prosocial behavior is

viewed as a process of gradual mastery, achieved through practice that is mediated by adults, followed by a second stage in which prosocial strategies become internalized and consolidated. The Vygotskian concept of the child's zone of proximal development suggests that children learn best when adults start with skills that are at the child's level and progressively model and scaffold their abilities at higher levels. When applied to the development of peer interaction skills, group interactions provide opportunities for adults to suggest that children play together, redirect children to ask each other for help, suggest roles in a dramatic play center, or script play for children requiring more support. As children's language and thinking skills develop, adults scaffold their social participation at increasingly higher levels, withdrawing support when children are observed to use prosocial behaviors with their peers and increasing support when instances of aggression are noted.

The current study, which investigated the effects of the in-service education program on children's aggressive and prosocial behaviors, is a secondary analysis of children's data from the original Girolametto et al. (2004) study. Girolametto and colleagues reported that educators learned to use verbal support strategies to encourage peer interactions in comparison to educators in a control group. Specifically, the educators used more utterances that prompted communication between peers (e.g., "Jonathan, tell Aravind where your car is going") and invited children to interact together (e.g., "Salma, help Melanie put the babies to sleep"). In turn, the children in the experimental group initiated more interactions with peers and engaged in extended peer sequences more often than children in the control group did (Girolametto et al., 2004). Although the increased frequency of peer interactions is a positive finding, this study did not report specific information about the impact of training on children's aggressive and prosocial behaviors.

The current study extends the previous study by asking two related questions. The first question examined whether children in the experimental group used fewer aggressive behaviors following the in-service program relative to children in the control group. It was predicted that children in the experimental group would use fewer forms of physical and verbal aggression than children in the control group based on previous meta-analyses showing that social skills training produced small to moderate effects in reducing aggressive behaviors in children (Schneider, 1992; Tremblay et al., 2008). It was also predicted that boys would experience a greater decrease in aggressive behaviors following the in-service program than girls. Generally, boys display more physical and verbal aggression than girls during play (Crick et al., 1997; Crick & Grotpeter, 1995; Grotpeter & Crick, 1996; Zimmer-Gembeck, Geiger, & Crick, 2005). Consequently, the in-service program could potentially influence the behaviors of boys more than those of girls.

The second question examined whether children in the experimental group used more prosocial behaviors following the in-service program in comparison to children in the control group. It was predicted that children in the experimental group would use significantly more prosocial behaviors based on an earlier study that demonstrated increases in children's prosocial behaviors following intervention (Hune & Nelson, 2002). It was also predicted that girls would engage in more prosocial behaviors as compared to boys, because previous studies have found that girls typically use more prosocial behaviors as compared to boys of the same age (Hay, Castle, Davis, Demetriou, & Stimson, 1999).

METHOD

Participants

Early childhood educators. The participants in this study were 17 early childhood educators who worked in seven licensed child care centers in the metropolitan area of Toronto, Ontario, Canada. All educators had completed high school as well as 2 years of postsecondary education at a community college, resulting in a diploma in Early Childhood Education. None of the educators had received any specific training in peer interaction since completing their formal education. All educators were female, had at least 2 years of experience in child care settings, and were the lead educators responsible for curriculum planning. Descriptive data on their pretest characteristics can be found in Table 1. There were no significant differences between the experimental and control groups for age, number of years of education, or years of experience ($U_s = 30.5, 29.0, \text{ and } 17.0$; $p_s = .606, .541, \text{ and } .074$, respectively). All educators worked in preschool classrooms

TABLE 1
Characteristics of the Early Childhood Educators

Variable	<i>Experimental Group (n = 8)</i>	<i>Control Group (n = 9)</i>
Age (years)		
<i>M (SD)</i>	37.6 (7.1)	40.3 (8.5)
Range	28–48	28–54
Years of education		
<i>M (SD)</i>	15.8 (2.7)	15.1 (1.5)
Range	12–20	14–17
Years of experience		
<10	4	6
>10	4	3

that had an adult:child ratio of 1:8 as mandated by law in the Province of Ontario. Most child care centers had class sizes of 24 children, but three classrooms in each group had an enrolment of only 16 children. The educators were randomly assigned to experimental and control groups by center so that colleagues from the same center could attend the in-service program together. This was also done to prevent experimental and control group members from talking to one another and influencing the outcomes. Therefore, four centers (i.e., eight educators) were randomly assigned to the experimental group and three centers (i.e., nine educators) were randomly assigned to the control group. A brief description of the in-service programs can be found in Appendix A.

Children. Each educator was videotaped interacting with a small group of four typically developing children from her classroom. All children were developing normally according to parent report and had age-appropriate speech and language development as determined by the educators' completion of the Speech and Language Assessment Scale (SLAS; Hadley & Rice, 1993). Most of the children attended the facility on a full-time basis (i.e., at least 40 hr per week) and had attended the particular child care center for at least 2 months before the study. At pretest, the children ranged in age from 32 to 54 months, and the experimental and control groups did not differ from each other statistically in terms of the children's chronological age ($U = 546.0$, $p = .712$), length of time in child care ($U = 504.0$, $p = .372$), gender ($\chi^2(1, N = 68) = 2.85$, $p = .144$), or full-time versus part-time attendance ($\chi^2(1, N = 68) = 3.47$, $p = .098$). Summary data describing the characteristics of the children can be found in Table 2. The group size was set at four children

TABLE 2
Characteristics of the Children in the Experimental and Control Groups

Variable	Experimental Group ($n = 32$)	Control Group ($n = 36$)
Age (months)		
<i>M</i> (<i>SD</i>)	42.6 (5.5)	41.8 (5.9)
Min-max	34-54	32-52
Gender		
Male	19	14
Female	13	22
Time in child care (months)		
≤ 12	13	15
13-24	15	13
≥ 25	4	8
Attendance		
Full time	23	33
Part time	9	3

because previous research had indicated that adult language input was adversely affected by larger group sizes (Pelligrino & Scopesi, 1990) and that young children were more interactive in small- rather than large-group settings (McCabe et al., 1996; Wasik, 2008). Therefore, the findings of this study may only be generalizable to similar group sizes.

Design and Procedure

The study utilized a pretest–posttest control group design with random assignment to experimental and control groups with stratification for center. Educators in the control group were assessed at pretest and posttest using the same procedures as the experimental group and participated in a placebo program that focused on adult–child interaction. The advantage of this type of control group is that the educators had an equal number of sessions, center-based visits, and interactions with a speech-language pathologist. No information on promoting peer interaction was provided to the control group during the 6-week control phase, but once the posttests were concluded they received one session on facilitating peer interaction.

The early childhood educators in the experimental group received an in-service education program titled *Fostering Peer Interaction in Early Childhood Settings* (Greenberg, 2005) that taught them how to observe play groups and make suggestions that facilitate peer interactions. Strategies included manipulating the environment to create play groups, redirecting conversation from themselves to other children, suggesting roles for children, and modeling interactions and then fading participation. Educators in the control group received an in-service education program titled *Encouraging Language Development in Early Childhood Settings* (Greenberg, 2005) that taught them strategies for playing directly with children and facilitating their language acquisition (e.g., follow the children's leads, be face to face, imitate, interpret, comment on the children's topic, take turns with children). The strategies taught in the latter program did not overlap in content with the peer interaction program. See Appendix A for a description of the two in-service programs used in this study. A speech-language pathologist from The Hanen Centre, who delivered the experimental in-service training program, contacted the supervisors of the child care centers to confirm their interest in participating in the program. The clinician conducted two 1-hr orientation sessions, one for the experimental group and one for the control group, to describe the in-service training requirements and the research components of the program. The educators who agreed to participate in the study completed a brief questionnaire that requested demographic information (e.g., age, training, years of experience). They were given copies of research information and consent forms to distribute to

the parents of all the children in their classroom. Educators provided consent forms to the parents of all children in their classroom prior to videotaping. From the group of eligible children with returned signed consent forms, two boys and two girls were selected at random to participate in this study.

Then 1 to 2 weeks after the orientation session, a research assistant visited each of the centers to meet the educators, collect all parent consent forms, and make appointments for filming adult-child interactions. The educators completed the SLAS (Hadley & Rice, 1993) separately for each of the children in order to provide information on their speech and language development.

The second visit (pretest) for all educators occurred immediately before the experimental program. A portable digital camera with a directional microphone was used to videotape the educator and children. Only the children participating in the study were videotaped; the other children played with similar materials in another room or in a different area of the same classroom or participated in outdoor play. The groups were videotaped for 15 min in a dramatic play area and 15 min in a block play area. The order in which the two contexts were filmed was counterbalanced. The dramatic play took place in a kitchen center and included a sink, refrigerator, table, chairs, clothing, dolls, food, and kitchen utensils. Typically, the educator and children sat at the table or stood at a kitchen appliance. The block play activity took place nearby on the floor. It included the following objects: various sizes of blocks, vehicles, and plastic animal figures. The same procedure was used for videotaping the educator-child interactions at posttest 4 months later (immediately following the in-service program).

Following each visit, the educators completed an informal questionnaire (see Appendix B) that asked them to rate their impressions of the representativeness of their interactions on a 5-point scale (1 = more than usual, 3 = typical, 5 = less than usual). At pretest, all educators rated their amount of talk, rate of speech, and amount of playtime as typical (mean ratings = 2.8, 2.9, and 2.7, respectively). Similar ratings were obtained at posttest (amount of talk, 2.5; rate of speech, 2.8; amount of playtime, 2.6). Thus, these ratings provided some evidence that the educators believed that their interactions were similar to other, unobserved situations in the child care center.

In-Service Training Program

The experimental and control programs were delivered by two different speech-language pathologists, each certified by The Hanen Centre to administer Learning Language and Loving It—The Hanen Program for Early Childhood Educators. Appendix A summarizes the session-by-session content of the two in-service programs. Both 6-week programs included three

evening group sessions to teach program strategies and three individual videotaping and feedback sessions that took place in the child care center. The group sessions were 2.5 hr long and included learner-centered activities such as interactive lectures, observation and analysis of videotapes that illustrated program strategies, large- and small-group discussions, and role plays of program strategies. Chapters in a guidebook titled *Learning Language and Loving It* (Weitzman & Greenberg, 2002b) accompanied the content of each session. The three individual videotaping sessions consisted of a 5-min videotape of educators facilitating peer interaction followed by 30 min of individual feedback and discussion regarding the use of program strategies.

The experimental and control programs differed primarily in the content of the sessions. The experimental program included information on the development of peer interaction in preschool children, how to select appropriate activities to encourage peer interaction, and how to set up interactions through verbal supports. Verbal supports included (a) direct peer interventions (e.g., making a specific suggestion, prompting a child to talk with a peer, inviting peers to play together) and (b) indirect peer interventions (e.g., alerting children to common interests). For the purposes of this study, the latter category of supports also included praise for peer interaction (e.g., "Good sharing") because these utterances do not oblige the children to act. In contrast, the control program focused on strategies for enhancing adult-child interactions within small groups. These strategies included (a) providing child-oriented responses to children (e.g., waiting for initiations, using verbal and nonverbal responses that follow the children's plan-of-the-moment, being face to face) and (b) promoting interaction with children (e.g., waiting for turns, using combinations of questions and comments to encourage turns on topic). The control program did not include any content on peer interventions until after the posttests were completed. Therefore, the focus of the experimental program was to promote positive peer interactions and prosocial behaviors.

Outcome Measures

Language development. The educators completed the SLAS (Hadley & Rice, 1993) separately for each of the participating children. The rating scale has 19 items that assess children's language production, comprehension, and articulation skills on a 5-point scale (1 = very low, 3 = typical development, 5 = very high). The authors of the scale computed the reliability of the SLAS by asking teachers and assistant teachers to rate children's language skills (Hadley & Rice, 1993). Individual analyses of variance did not detect any differences between raters. Construct validity of the SLAS was conducted by correlating the scale with the Peabody Picture

Vocabulary Test–Revised (Dunn & Dunn, 1997) and the children's mean length of utterance. The SLAS mean rating yielded moderate to moderately high correlations with these measures (Hadley & Rice, 1993). For the purposes of this study, the 19 items of the SLAS (Hadley & Rice, 1993) were averaged to provide an overall language rating for each child. An additional measure of language ability, namely, the frequency of verbal utterances used by each child at pretest, was derived from the videotapes of educator–child interactions.

Outcome measures derived from videotapes. The videotaped interactions were coded to yield three outcome measures: the frequency of physically aggressive behaviors, the frequency of verbal aggression, and the frequency of prosocial behaviors. The 15 min of the block play and the 15 min of the dramatic play were collapsed to yield a total of 30 min of observation per child, because the frequencies of aggressive and prosocial behaviors were low and there were no significant differences between these two contexts with respect to these behaviors. Similarly, previous studies of aggressive behaviors have also used frequencies of behaviors to assess a child's level of aggression (Dionne, Tremblay, Boivin, Laplante, & Perusse, 2003; Estrem, 2005). Coding was completed by directly observing the videotapes and recording instances of aggressive and prosocial behaviors on a recording form. When a behavior of interest was noted, the coder paused the video playback unit, noted the behavior on the coding form, then resumed playback. The coding system measured seven physically aggressive behaviors, five verbally aggressive behaviors, and three prosocial behaviors. Physically aggressive behaviors were hitting, kicking, shoving/pushing, grabbing, throwing, tripping, and pulling. Verbally aggressive behaviors were yelling, arguing, insulting, name calling, and teasing. Prosocial behaviors were sharing, helping a peer, and making friendly verbal utterances.

All videotapes were coded by the first investigator, and 20% of the videotapes (i.e., 210 min of interaction) were randomly selected and recoded by an independent research assistant for reliability purposes. Both coders were blind to the group assignment of the participants, and the independent research assistant was unaware of the purpose of the study. Interrater reliability was conducted using the following formula: $\frac{\text{number of agreements}}{\text{the number agreements} + \text{disagreements}} \times 100$ (Sackett, 1978). Interrater reliability was 95.5% for physical aggression ($n = 89$), 84.6% for verbal aggression ($n = 26$), and 86.9% for prosocial behaviors ($n = 145$). The lower percent agreement for verbal aggression, although acceptable, occurred because there was a very low incidence of this behavior in the videotaped interactions.

RESULTS

The results are presented in two sections: (a) group comparisons of aggressive behaviors and (b) group comparisons of prosocial behaviors. Language development for each child was tested as a possible covariate of aggression and prosocial behavior, as it has been found that language ability influences children's use of aggressive behaviors (Dionne et al., 2003; Estrem, 2005). However, no significant relationship was found between the two estimates of children's language ability and measures of aggression and prosocial behaviors, and consequently the data are not presented here. For each outcome measure, the data were submitted to a mixed analysis of variance, with time (pre- and posttest) as the within-subjects factor and research group (intervention, control) and gender (boys, girls) as the two between-subjects factors, with one-tailed alpha set at $p < .05$. One-tailed tests were used because directional hypotheses were made for each research question.

The first question investigated whether the experimental and control groups differed from each other in their use of aggressive behaviors following intervention. Because of low frequencies of aggression, codes for physical and verbal aggression were collapsed to yield one measure of aggression. Table 3 summarizes the means and standard deviations for aggressive behaviors at pretest and posttest. Overall pretest means of 2.91 and 2.00 for the experimental and control groups, respectively, indicated a low frequency of aggressive behaviors overall. The marginal effects and interactions were tested using the multivariate criterion of Wilks's lambda (Λ). The Time \times Group interaction did not reach significance, $\Lambda = 0.99$, $F(1, 64) = 0.73$, $p = .40$, partial $\eta^2 = 0.01$; nor did the time marginal effect, $\Lambda = 0.99$, $F(1, 64) = 0.25$, $p = .62$. In addition, the gender marginal effect was not significant, $F(1, 64) = 1.317$, $p = .128$; however, the Time \times Gender interaction did reach significance, $\Lambda = 0.94$, $F(1, 64) = 4.30$, $p = .02$, partial $\eta^2 = 0.06$. Follow-up paired t tests indicated that the mean frequency of boys'

TABLE 3
Means and Standard Deviations for the Frequency of Children's Aggressive Behaviors and Prosocial Behaviors

Behavior	Time	Experimental Group <i>M (SD)</i>	Control Group <i>M (SD)</i>	<i>p</i> Values for Time \times Group Interaction
Aggressive	Pretest	2.90 (4.2)	2.00 (2.3)	.396
	Posttest	1.93 (2.5)	2.28 (2.9)	
Prosocial	Pretest	2.41 (2.5)	2.56 (2.9)	.040*
	Posttest	5.78 (5.9)	3.86 (2.7)	

* $p < .05$.

aggressive behaviors decreased significantly from pretest to posttest, $t(1, 32) = 1.82, p = .04$, although the same analysis for girls was not significant. The data indicated that the mean frequency of boys' aggressive behaviors decreased from 3.3 at pretest to 1.9 at posttest.

The second question investigated whether the children in the experimental and control groups differed from one another in their use of prosocial behaviors following intervention. Table 3 summarizes the means and standard deviations for prosocial behaviors at pretest and posttest. Pretest means of 2.41 and 2.56 for the experimental and control groups, respectively, indicated that the frequency of prosocial behaviors was low overall prior to intervention. At posttest, the means for prosocial behaviors increased to 5.78 and 3.86 for the experimental and control groups, respectively. The Time \times Group interaction effect for the frequency of prosocial behaviors was significant, $\Lambda = 0.94, F(1, 64) = 3.91, p = .03$, partial $\eta^2 = 0.06$. This result reveals that the children in the experimental group used a higher frequency of prosocial behaviors at posttest relative to those in the control group. However, there were no significant differences for the gender marginal effect, $F(1, 64) = 0.930, p = .170$; the Time \times Gender interaction effect, $\Lambda = 0.98, F(1, 64) = 1.46, p = .23$, partial $\eta^2 = 0.02$; or the time marginal effect, $\Lambda = 0.81, F(1, 64) = 15.37, p = .00$, partial $\eta^2 = 0.19$.

DISCUSSION

The primary objective of the current study was to examine whether educators' participation in an in-service training program facilitated children's prosocial behaviors and decreased their aggressive behaviors. Overall, findings support the efficacy of this in-service training in increasing the frequency of children's prosocial behaviors during small-group interactions. This positive finding is consistent with the theoretical view proposed by Vygotsky (Berk & Winsler, 1995) that adults' use of scaffolding (e.g., verbal strategies to encourage prosocial behaviors) can create positive learning environments and the successful acquisition of skills.

The results of this study did not reveal a significant difference between the two groups of children in their use of aggressive behaviors following the in-service training program. One explanation for the lack of significant findings may reside in the fact that none of the children had been identified as aggressive at pretest. Overall, there were low frequencies of physical and verbal aggression during the pretest, an average of approximately four behaviors per child in the experimental group and three behaviors per child in the control group across 30 min of observation at each test. Physical and verbal aggression was combined in the analyses because of the low incidence of

these forms of aggression individually. The observed frequencies of aggressive behaviors are consistent with the findings of Alink et al. (2006), who examined developmental trends in the use of aggressive behaviors for typically developing children. In addition, past research with aggressive children has used a cutoff of 0.4 aggressive behaviors per minute to identify those children exhibiting higher than normal ranges of aggression (Bolstad & Johnson, 1972). None of the children in this sample met or exceeded these levels of aggression in the 30 min of observation.

An alternative explanation for the observed low rates of aggressive behavior may be that the small-group interactions provided sufficient individualized attention from the educators, making behavior management easier (e.g., Wasik, 2008). In small groups, educators can attend to children more quickly, anticipate their needs, and respond to their requests more efficiently than in larger groups. Consequently, this methodological feature may have reduced the overall incidence of aggressive behaviors (Maccoby, 1990). To measure the success of this in-service training in decreasing aggressive behaviors, the current study needs to be replicated using a sample of children identified as aggressive.

Another potential explanation for the lack of significant findings for aggression pertains to the nature of the in-service education program used for the control group. Although experimental and control programs differed in their content, the control program promoted language development through responsive adult-child interaction. Responsive interactions may have mediated children's aggressive behaviors by improving their communication skills (Dionne et al., 2003). Although there was no evidence that any of the children in either group had language disorders, future evaluations of the experimental program need to be conducted using usual care control groups.

Of interest is that post hoc examinations of the individual data revealed that the three children who engaged in the highest frequencies of aggressive behaviors during the pretest (i.e., more than 10 behaviors in 30 min) reduced their aggressive behaviors at posttest to levels that were consistent with the mean values of the group. These data are consistent with the finding that aggression in preschoolers decreases with developmental progress (Tremblay et al., 2008). Furthermore, the results showed that although there was no significant reduction in the frequency of aggression attributable to in-service training, there was a significant decrease in the aggressive behaviors of boys across time in both groups collapsed. These results may reflect the higher levels of initial aggression seen in boys in the sample as compared to girls (e.g., $M_s = 3.33$ for boys and 1.57 for girls).

The results regarding prosocial behaviors revealed that the children in the experimental group displayed significantly more prosocial behaviors than those in the control group following the in-service training. In the previous

study (Girolametto et al., 2004), educators increased their use of strategies that facilitated communication (i.e., the adult rephrased what the child said to another child or prompted children to talk to each other) and redirected peers to each other (i.e., the adult invited children to interact with each other or asked them to help each other). These changes in educators' strategies appeared to result in an increase in children's prosocial behaviors during play interactions. Given the importance of prosocial behaviors as a protective factor (Coie & Kupersmidt, 1983; Crick et al., 1997; Ladd et al., 1988), this finding is a promising one. Future research needs to investigate the longer term impact of children's use of prosocial behaviors on their social-emotional well-being.

From a practical perspective, the increase in prosocial behaviors produced by the experimental in-service program is highly positive. The in-service education program used in this study was a naturalistic intervention that incorporated incidental teaching of prosocial behaviors. With naturalistic interventions, such as the one used in this study, the implementation of strategies follows the children's lead and scaffolds social interaction skills on the fly. Thus, this study adds to the evidence base indicating the efficacy of naturalistic interventions that focus on facilitating peer interactions (Brown et al., 2001).

Several limitations must be noted in interpreting the findings of this study. First, the present study had a small number of educators who were observed with small groups of children within a restricted number of contexts. Replication involving larger groups of children and observation of naturalistic activities is needed to construct a complete picture of the potential effects of the in-service training on children's aggression and prosocial behaviors. Second, the sample size was relatively small. Replication of this study with a larger sample of children is needed to address issues of power. Future studies need to examine whether child variables, such as gender or language ability, moderate the effects of intervention. Third, the current study looked at mixed-gender groups only, and thus the results found can only be generalized to similar groupings of children (i.e., not to same-gender groups). Fourth, the study is limited in terms of the composition of the experimental and control groups. Every effort was made to ensure that group composition was balanced, however there were more girls than boys in the control group. Future research should replicate this research with gender-balanced groups. Finally, ethnicity data were not systematically examined to determine how cultural issues may have impacted children's use of aggressive or prosocial behaviors. Cultural differences need to be examined in future studies to better understand any relationships that may exist among culture, aggression, and prosocial behaviors during peer interactions.

The implications of this study include supportive evidence for naturalistic interventions focusing on facilitating peer interactions (Brown et al., 2001)

and practical suggestions that early childhood educators can implement in the classroom to promote positive peer interactions in small groups. The results of this study suggest that a brief in-service education program, such as the one described in this study, may be a viable method of facilitating prosocial behaviors in typically developing preschoolers in child care centers. These results extend the findings of a previous study that reported positive results of this in-service program for increasing the frequency of children's peer interactions. Given that prosocial behaviors have been found to act as a protective factor against peer rejection and to enhance the social status of children as young as 3 years of age (Coie & Kupersmidt, 1983; Crick et al., 1997; Ladd et al., 1988), this finding has positive implications for children's social-emotional development.

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APPENDIX A

Description of the In-Service Programs Experimental Program on Peer Interaction

Session 1	This first evening session reviewed the importance of peer interactions and the developmental effects of children's language skills and conversational styles on peer interactions. Videotapes illustrating the types of play (i.e., functional, constructive, dramatic, games with rules) and their impact on the amount and type of social interactions were shown.
Session 2	In this second evening session, staff learned how well-defined play areas and appropriate activities can encourage children's participation and interaction with peers. Examples of dramatic, sensory, snack, and other novel activities were discussed. Staff brainstormed how to facilitate peer interaction by making the most of how space is organized in the classroom, selecting appropriate activities, and grouping children appropriately.
Videotaping Session	Educators practiced program strategies in real-life, naturalistic contexts, with coaching and feedback from the speech-language pathologist.
Session 3	In this third evening session, specific verbal support strategies were discussed and illustrated (including promoting communication by prompting children to talk, making indirect suggestions that alert children to situational cues, using peer referrals to prompt children to play together, praising successful or positive peer interactions). Staff learned how to direct child-initiated conversations away from themselves to another child in the group.
Videotaping Session	Educators practiced program strategies in real-life, naturalistic contexts, with coaching and feedback from the speech-language pathologist.
Session 4	In the final evening session, staff reviewed the verbal support strategies learned in Session 3 and focused on maintaining peer interactions for longer periods of time. Strategies such as (a) suggesting the next step in a play situation, (b) offering new props, and (c) developing clear roles for the children in the activity were illustrated and role-played.
Videotaping Session	Educators practiced program strategies in real-life, naturalistic contexts, with coaching and feedback from the speech-language pathologist.

Control Program on Adult–Child Interaction

Session 1	This first evening session reviewed the importance of language and the developmental sequence of communication development in young children. Videotapes illustrating children’s conversational styles (e.g., sociable, reluctant, passive) and the types of adult–child interactions and their impact on children’s communication were shown.
Session 2	In the second session, staff learned to observe, wait, and listen for children’s initiations; be face to face; and follow the children’s lead by imitating, interpreting, or commenting on the children’s plan-of-the-moment. The emphasis was on providing children with language models that are at their level of interest and communication development.
Videotaping Session	Educators practiced program strategies in real-life, naturalistic contexts, with coaching and feedback from the speech-language pathologist.
Session 3	In the third session, the focus was on increasing turn taking in adult–child conversations. Educators discussed and role-played strategies such as waiting expectantly and using questions that show interest and create anticipation. Asking questions appropriate to the children’s levels and avoiding rhetorical questions or test questions were also stressed.
Videotaping Session	Educators practiced program strategies in real-life, naturalistic contexts, with coaching and feedback from the speech-language pathologist.
Session 4	Staff reviewed the strategies learned in Sessions 2 and 3 and focused on encouraging uninvolved children to interact with the teacher in small-group activities. Strategies that addressed how to scan for children who are not interacting and how to adapt responses to draw children into a conversation were illustrated and role-played.
Videotaping Session	Educators practiced program strategies in real-life, naturalistic contexts, with coaching and feedback from the speech-language pathologist.

APPENDIX B

Educator Representativeness Questionnaire

NAME/ID: _____ DATE: _____

In comparison to a typical day, how would you rate your behavior in terms of:

(circle one rating per item)

1. AMOUNT OF TALKING	5	4	3	2	1
	less than usual		typical		more than usual
	5	4	3	2	1
2. SPEED OF TALKING	less than usual		typical		more than usual
	5	4	3	2	1
3. AMOUNT OF PLAYTIME	less than usual		typical		more than usual
