

# Reducing Aggression in Children With Autism Toward Infant or Toddler Siblings

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*Children with autism often lack appropriate means to communicate and may rely on aggression and other disruptive behaviors to express their needs. This may be a particularly serious problem when aggression occurs toward an infant or toddler, who could be severely injured by an older sibling. This study examined the use of functional assessment and individualized parent-implemented intervention plans in the home setting, including functional communication training with relevant ecological manipulations. Data were collected in the context of a multiple baseline design across three families. The results showed that after the intervention there were: (1) large reductions in the children's aggression toward their infant or toddler sibling, (2) increases in parent and child happiness level, and (3) increases in strangers' level of comfort with respect to interacting with the family. The results are discussed in terms of improving the overall quality of life for families of children with autism.*

**DESCRIPTORS:** autism, functional assessment, home intervention, parent-professional relations, parents

Severe aggression, particularly directed toward a younger infant or toddler sibling, is of particular concern because of its detrimental effects on physical and emotional wellbeing. Studies of typically developing siblings continue to describe long-lasting negative consequences of sibling aggression (Gully, Dengeriak, Pepping, & Bergstrom, 1981; Steinmetz, 1978; Loeber, Weissman, & Reid, 1983). For many children with autism, aggression is a pervasive disruptive behavior. Such children often lack appropriate means to communicate their needs and instead may become aggressive (Carr & Durand, 1985).

In addition to potential sibling injury from aggres-

sion, studies document elevated stress levels in parents whose children display aggression (Moes, 1995). Similarly, concern over managing problem behaviors is one of the key factors contributing to parenting stress (Koegel et al., 1992; Moes, Koegel, Schreibman, & Loos, 1992). Furthermore, aggression and other disruptive behaviors often limit a child's inclusion into community settings (Horner, Dunlap, & Koegel, 1988; Van Bourgondien & Elgar, 1990) and are a determining factor in a child's placement in more restrictive settings (Eyman & Call, 1978).

Recent directions in the treatment of aggressive behavior have focused on identifying and teaching adaptive behaviors to replace the original disruptive behavior (Carr & Durand, 1985; Mace & Roberts, 1993). Determining the circumstances under which aggression will and will not occur is essential information necessary to develop effective interventions (Wacker et al., 1990). In addition, ecological manipulations, such as changes in the physical environment, have been used to decrease disruptive behaviors and encourage certain types of adaptive behavior (Dunlap, Kern-Dunlap, Clark, & Robbins, 1991; Nordquist, Twardosz, & McEvoy, 1991). Such procedures, often developed by using data from a functional assessment of variables related to the disruptive behavior, have been recognized as especially important in successfully producing changes in behavior. Effective programs have been implemented in various settings such as in the home (Day, Horner, & O'Neill, 1994), school (Sasso et al., 1992), and clinic (Northup et al., 1991) with many communicative partners including adults and peers.

An important extension of this work would be to apply these procedures to the problem of sibling aggression in children with autism, and to assess the effects of a parent-implemented intervention in the home setting. The specific purpose of this study was to assess whether changing antecedent stimuli associated with aggression through functional assessment and a parent-implemented intervention, including functional communication training with relevant ecological manipulations, would be effective in reducing sibling aggression in children with autism who aggress toward their infant or toddler siblings. The second goal of this study was to assess the effects of the above manipulations on child affect, parent affect, and strangers' comfort level.

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## Method

### Participants

Three sibling dyads, who lived at home with their parents, participated in this study. Within each dyad the older sibling was diagnosed as having autism or a related developmental disability by an independent diagnostician, and the infant or toddler sibling was not diagnosed as having a disability. Additional criteria for participation in the study included complaints by parents of physical aggression directed toward the younger sibling.

**Dyad 1.** The first dyad consisted of a 5-year, 10-month-old girl diagnosed with autism and her 8-month-old sister. Child 1 achieved a score in the 4th percentile on the Peabody Picture Vocabulary Test—Revised. She was able to combine words to form simple sentences (although she rarely initiated verbal interactions), was toilet trained, and could perform self-help skills such as dressing herself with minimal assistance. Her parents' primary concern was her aggressive behavior directed toward her infant sibling. Aggressive behavior reported by the parents typically took the form of yelling, pinching, and hitting, which often resulted in crying by her younger sibling.

**Dyad 2.** The second dyad consisted of a 4-year, 3-month-old boy diagnosed with a mixed developmental disorder with autistic-like characteristics and his 7-month-old brother. The Peabody Picture Vocabulary Test—Revised and the Expressive One Word Vocabulary Test yielded scores below the 1st percentile and at the 2nd percentile, respectively. He primarily used one- and two-word utterances, was not fully toilet trained, and needed considerable assistance with most self-help skills such as dressing and bathing. In addition to concerns about general developmental delays, his parents expressed particular concern about noncompliance and aggression. Aggression toward his infant sibling was reported by his parents to be hitting, rolling over on top of his brother, pinching, shoving, and grabbing objects away from his brother.

**Dyad 3.** The third dyad consisted of a 4-year, 10-month-old boy diagnosed with autism and his 6-month-old brother. Although he was difficult to test because of numerous disruptive behaviors, he obtained a score at the 1st percentile on the Peabody Picture Vocabulary Test—Revised before the start of intervention. He was able to combine three to four words to form simple sentences, was toilet trained, and could complete most age-appropriate self-help skills with minimal guidance, but would typically engage in solitary self-stimulatory behavior (shaking leaves, strings, or other objects in front of his eyes) when not guided in appropriate activities. Aggressive behavior reported by his parents consisted of kicking, hitting, pinching, squeezing, head butting, poking his brother's head with his index finger, and sitting on top of his brother.

### Setting and Materials

Settings and activities where aggression occurred were selected by the parents. For dyad 1, sessions took place at the kitchen table or the outside patio table during regular meal times. For dyads 2 and 3, sessions were conducted during play sessions on the living room floor. Fifty-eight percent of the sessions were videotaped and the remainder of the sessions were scored on-line. Video equipment was placed in a corner of the room: when observers scored sessions in vivo, they stood in a corner of the room and did not interact with the parents or children.

### Design

Data were collected in a multiple baseline across participants (Barlow & Hersen, 1984). Sessions were conducted one to four times per week in probes throughout the experiment, with the sessions typically lasting 15 to 30 min and occurring approximately the same time each day.

### Baseline

During baseline the parents were instructed to interact naturally during play sessions or meal time. The baseline period for child 1 was 10 weeks, for child 2 was 14 weeks, and for child 3 was 15 weeks. During the baseline sessions, data were recorded by a clinician using functional analysis data sheets to identify stimuli associated with the problem behavior (Frea, Koegel, & Koegel, 1993; O'Neill, Horner, Albin, Storey, & Sprague, 1990). Events preceding and following each occurrence of disruptive behavior in the home were recorded.

### Intervention

The intervention plan for each of the three children was implemented through a parent consultation model, where the parents implemented the intervention plan in their own homes with prompts if necessary (see arrows in Fig. 1). This general approach consisted of three phases. First, based on information obtained during baseline, the stimuli identified as most associated with problem behavior were determined. Then, during an initial meeting, the parents and a clinician developed an intervention plan that was maximally compatible with each family's values and lifestyle. The intervention plan was designed to identify strategies for minimizing the occurrence or duration of stimuli associated with problem behavior. Second, the parent was prompted by a clinician to rearrange the environment as required and to teach appropriate replacement behaviors for the aggression that had the function of minimizing the stimuli associated with problem behaviors. Prompting initially was provided during non-crisis times, so that the appropriate behaviors would be well-established and could easily be elicited during subsequent crisis times. Third, the clinician's prompts were removed (or reduced, when necessary) as the parent and child began to ex-

hibit the spontaneous use of their respective targeted behaviors. The details of these procedures as implemented for each of the children are described below.

**Dyad 1.** For child 1, four antecedent stimuli were most frequently recorded as occurring in association with aggression: (1) sibling loudly kicking the metal tray on the high chair, (2) sibling making vocal noises, (3) sibling crying, and (4) a "down time" period, when the children sat alone at the table not engaged in activities while the mother finished food preparation. A multicomponent intervention was implemented in relation to the following four stimuli. First, in relation to the baby kicking the metal tray, it was hypothesized that aggression occurred to escape from aversive noise. For this function, the metal high chair tray was replaced with a plastic tray to reduce noise. Second, in response to the baby making vocal noises or crying, it was hypothesized that aggression also occurred to escape from aversive noises. Therefore, the child with autism was taught to respond to the baby's vocal noises by saying phrases to the parents such as "(baby's name) is talking" and "(baby's name) needs help." Third, as an additional intervention for this function, toys and objects (e.g., pacifier and bottle) were made accessible to child 1 so that she could respond to the infant's needs herself when the baby cried. Fourth, it was hypothesized that aggression occurred during the down time period as a way to seek attention. Therefore, the down time period was restricted by prompting the mother to prepare the bulk of the meal before sitting the children in their chairs and prompting the parents to increase family interactions through procedures 2 and 3 described above.

Specifically, at the start of intervention the parent replaced Child 1's metal tray with a plastic tray. Also, before each meal, infant toys and other objects (e.g., pacifier and bottle) were placed nearby so they would be accessible for Child 1 to give her sibling. In addition to these environmental manipulations, during the first 2 weeks (three sessions) of intervention a clinician prompted (see arrows in Figure 1) the parent to establish the functionally equivalent replacement behaviors during noncrisis times so that they could be elicited more easily during crisis times. Child 1's mother was prompted every few minutes during the first session, then just before dinner during the second and third session. The mother was prompted, when the baby was making noises, to ask Child 1 to say "(baby's name) is talking," to request the mother's assistance, and to give the sibling a toy. During these first 2 weeks the mother began spontaneously prompting the child and the child began spontaneously using the functionally equivalent replacement behavior, therefore the clinician prompts were discontinued.

**Dyad 2.** For Child 2, three antecedent stimuli were most frequently recorded as occurring in association with aggression: (1) Child 2's mother on the telephone or in another room, (2) Child 2's infant sibling touching

or interfering with his toys, and (3) the infant approaching or being near Child 2's toys while he was playing. A multicomponent intervention was implemented in relation to these three stimuli. First, in response to his mother being on the phone or in another room, it was hypothesized that aggression occurred as a way to seek attention. Therefore, Child 2 was provided with contingent attention from his mother for gradually longer intervals of independent play. Second, in response to the infant touching or interfering with Child 2's toys, it was hypothesized that aggression occurred to maintain possession of the toys. Therefore, various infant toys were made available, and Child 2 was taught to give his brother one of the infant toys or to redirect him to play with an infant toy when he touched or interfered with Child 2's toys. Third, in relation to the infant sibling approaching or being near Child 2's toys while he was playing, it was hypothesized that aggression was used to maintain possession of the toys. Therefore, he was taught to give his brother an infant toy and/or to say to his mother, "Take (sibling's name)," as a method of soliciting the parent's assistance in reducing the infant's interference with Child 2's toys during their play activities.

Specifically, at the start of intervention, Child 2's parents placed a basket of infant toys in the play area so they would be accessible for Child 2 to give his sibling. In addition, during the first three weeks of intervention (three sessions) the clinician prompted the parent to establish the appropriate functionally equivalent response in Child 2's repertoire during noncrisis times so that it could be more easily elicited during crisis times. To do this, Child 2's mother was prompted every few minutes to ask Child 2 to give his sibling a toy or to ask his mother to remove the sibling. In addition, at the initiation of all instances of aggressive behavior, the parent was prompted to ask the child to use the functionally equivalent replacement behavior. After 3 weeks of prompting, prompts were gradually reduced (see arrows in Figure 1) over 4 weeks (four sessions) Child 2's mother began to prompt him spontaneously and Child 2 began to use the functionally equivalent response.

**Dyad 3.** For Child 3, three antecedent stimuli were most frequently recorded as occurring in association with aggression: (1) sibling touching or interfering with his toys, (2) sibling touching Child 3's body, and (3) sibling crying and making noises. A multi-component intervention was implemented in relation to the following stimuli. First, in relation to the infant sibling touching or interfering with Child 3's toys, it was hypothesized that aggression occurred to maintain possession of the toys. Therefore, infant toys were made accessible to Child 3 and he was taught to give his sibling one of the infant toys so that the infant would not play with Child 3's toys. The second and third interventions, in relation to the infant touching Child 3's body and/or

crying and making noises, it was hypothesized that aggression was used to escape from aversive touching and to escape from noise. For these functions, Child 3's parents taught him the verbal communication "Take (sibling's name)" as a method of soliciting the mother's assistance in reducing the infant sibling's interference with Child 3's toys or to minimize the durability of the aversive noises and crying during their play activities.

The above intervention for Child 3 proceeded as follows. First, the parents placed a basket of infant toys in the play area so that it would be accessible for Child 3 to give to his younger sibling. During the first 3 weeks (six sessions) of the intervention, the clinician prompted the parent to establish appropriate functionally equivalent responses during noncrisis times so that they could be more easily elicited later during crisis times. This was accomplished by prompting the parent to ask Child 3 to give the infant a toy every few minutes, or to ask Child 3 to request the mother's assistance with respect to reducing the sibling's interference, touching, or noise level. Subsequently, at the initiation of all instances of aggressive behavior, the parent was prompted to ask the child to use the appropriate functionally equivalent response. During the first 3 weeks, the parent and Child 3 began to exhibit the spontaneous use of their respective targeted behaviors, therefore prompt fading was not necessary.

#### Data Collection and Response Definitions

The occurrence of aggressive behavior, as defined below for each child, was recorded in continuous 10-sec intervals (continuous 5-min intervals for Child 3 who typically interacted with his brother for longer periods of time during the sessions). The number of intervals with occurrences of aggressive behavior were then divided by the total number of intervals to yield a percentage of intervals with aggression during the session. In addition, the exact number of spontaneous (unprompted) occurrences of appropriate functionally equivalent replacement behaviors was recorded for each child. Specific definitions of aggressive behavior and appropriate replacement behaviors were as follow.

##### Child 1

**Aggression:** yelling, hitting the infant sibling with an open hand, and punching the infant sibling with a closed fist.

**Spontaneous Use of Targeted Appropriate Behaviors:** verbalizations such as "(baby's name) is talking" and "(baby's name) needs help" and verbal and non-verbal responses (such as handing the baby her pacifier or bottle) directed toward meeting the infant sibling's needs.

##### Child 2

**Aggression:** hitting, punching, rolling over on top of infant sibling, shoving sibling forcibly with an open

hand, grabbing toys and objects forcibly from sibling, kicking sibling, and yelling at sibling.

**Spontaneous Use of Targeted Appropriate Behaviors:** the verbal response "take (infant's name)" to request that his parents reduce the sibling from interfering with his toys and handing the infant sibling an infant toy or redirecting his sibling to use an infant toy.

##### Child 3

**Aggression:** kicking, pinching, squeezing, grabbing, placing his foot on or sitting on his sibling, tapping the sibling's head, head butting, and attempting to strike the sibling.

**Spontaneous Use of Targeted Appropriate Behaviors:** the verbal response "take (infant's name)" to request that his parents reduce the sibling from interfering with his toys and handing the sibling an infant toy.

#### Social Validity

Social validity was assessed on three variables (Child Happiness; Parent Happiness; and Stranger Comfort with the Interactions) by using six-point Likert scales, adapted from Dunlap and Koegel (1980) and Koegel and Egel (1979) to indicate the child's level of happiness, the parents' level of happiness, and strangers' level of comfort being with the children (Table 1). A minimum of 25% of all the sessions were used to assess social validity in the three categories. This was done during baseline, treatment, and follow-up for Children 1 and 2 (who had an adequate number of videotaped sessions to represent their behavior over a period of time). The videotaped sessions were drawn randomly from each condition and then averaged separately for each social validity category to provide 12 separate scores (i.e., scores for each child for each of the three categories of social validity). The observer was an undergraduate psychology student who only recorded data for the social validation measure. The observer did not know the children, was unaware of the order of conditions, and was naive to the purpose of the experiment.

For levels of child and parent happiness, observers' ratings in the 0 to 1 range indicated unhappiness, ratings in the 2 to 3 range indicated neutral affect, and ratings in the 4 to 5 range indicated happiness. Similarly, for strangers' level of comfort if they were to be in that setting, ratings in the 0 to 1 range indicated that they would be uncomfortable, ratings in the 2 to 3 range indicated that they would feel neutral, and ratings in the 4 to 5 range indicated that they would feel comfortable.

Both of Child 1's parents were present during most of the sessions throughout the study. Therefore, an additional social validation measure was used to assess whether any changes in the parents' amount of parent-parent conversation occurred as a possible collateral result of decreases in their child's aggression. Specifici-

Table 1.  
Rating Scales for Child/Parent Effect and Stranger Comfort

Child	Unhappy 0-1	Neutral 2-3	Happy 4-5
	Cries, pouts, tantrums. Appears to be sad, angry, or frustrated. Child seems not to be enjoying self (score 0 or 1 depending on extent of unhappiness).	Does not appear to be decidedly happy or unhappy. May smile or frown occasionally but overall seems rather neutral in this situation (score 2 or 3 depending on extent of happiness).	Smiles and laughs appropriately and seems to be enjoying self (score 4 or 5 depending on extent of enjoyment).
Parent	Unhappy 0-1	Neutral 2-3	Happy 4-5
	Parent appears frustrated. Does not seem to be or enjoying self (score 0 or 1 depending on extent of happiness).	Does not appear to be decidedly happy or particularly unhappy. May occasionally frown or smile but overall seems rather neutral in this situation (score 2 or 3 depending on extent of happiness).	Smiles and laughs appropriately. Seems to be enjoying self during meal or play period (score 4 or 5 depending on extent of happiness).
Stranger	How comfortable would you feel eating dinner or being the only adult in the setting?		
	Uncomfortable 0-1	Neutral 2-3	Comfortable 4-5
	Not very comfortable (score 0 or 1 depending on level of comfort).	Not comfortable or uncomfortable. Appears neutral (score 2 or 3 depending on level of comfort).	Comfortable (score 4 or 5 depending on level of comfort).

cally, data were collected on the number of 10-sec intervals with parent-parent conversational interactions during each condition for this family. Parent-parent conversational interactions were defined as any verbal exchange that occurred between the parents while sitting at the dinner table.

### Reliability

To measure the reliability of the dependent measures, two observers (undergraduate psychology students) independently recorded data during a minimum of 25% of the sessions for each dependent measure. For the measure of aggression (and similarly for the measure of spontaneous use of targeted appropriate behaviors), observers were considered to be in agreement when they recorded the same behavior during the same observation interval. A disagreement was defined as one observer recording a behavior and the other observer not recording the behavior or recording a different behavior. Interrater agreement was determined by dividing the number of agreements by the number of agreements plus disagreements multiplied by 100. The average percentage agreement for aggression for Child 1 was 89.6% (range 66.7–100%), for Child 2 was 90.1% (range 75–100%), and for Child 3 was 95% (range 80–100%). The average percentage agreement for spontaneous use of targeted appropriate behaviors for Child 1 was 92.6% (range 87.5–100%), for Child 2 was 96.3% (range 66.7–100%), and for Child 3 was 100%.

For the social validation ratings, agreements were defined as the two observers recording an average response for a given child in a given condition within the

same range [unhappy/uncomfortable (0–1), neutral (2–3), or happy/comfortable (4–5)]. The average percent agreement was 86.7%, with never more than a one-point difference between raters. Interrater agreement also was recorded for Child 1's sessions for the parent-parent conversational interactions. The observers were considered in agreement when they both recorded a parent-parent interaction in the same 10-sec interval. A disagreement was defined as one observer recording an interaction and the other observer not recording an interaction. The average percent agreement was 87.6% (range 80–100%).

## Results

### Aggression

Figure 1 shows the percentage of intervals with aggressive behavior for the three participants. Aggression toward the infant or toddler sibling occurred frequently during baseline sessions, which continued for 10 to 15 weeks across the three dyads. After the initiation of the intervention, aggression decreased. Baseline data show that the mean percent of intervals with aggression was 5.76%, 18.9%, and 68.9% for Children 1, 2, and 3, respectively. After the intervention, all of the children's levels of sibling aggression decreased, with no aggression occurring during eight of the sessions for Child 1, no aggression occurring during seven of the sessions for Child 2, and no aggression occurring during the final session for Child 3.

The follow-up sessions, also shown in Figure 1, show that the effects maintained across time for two of the

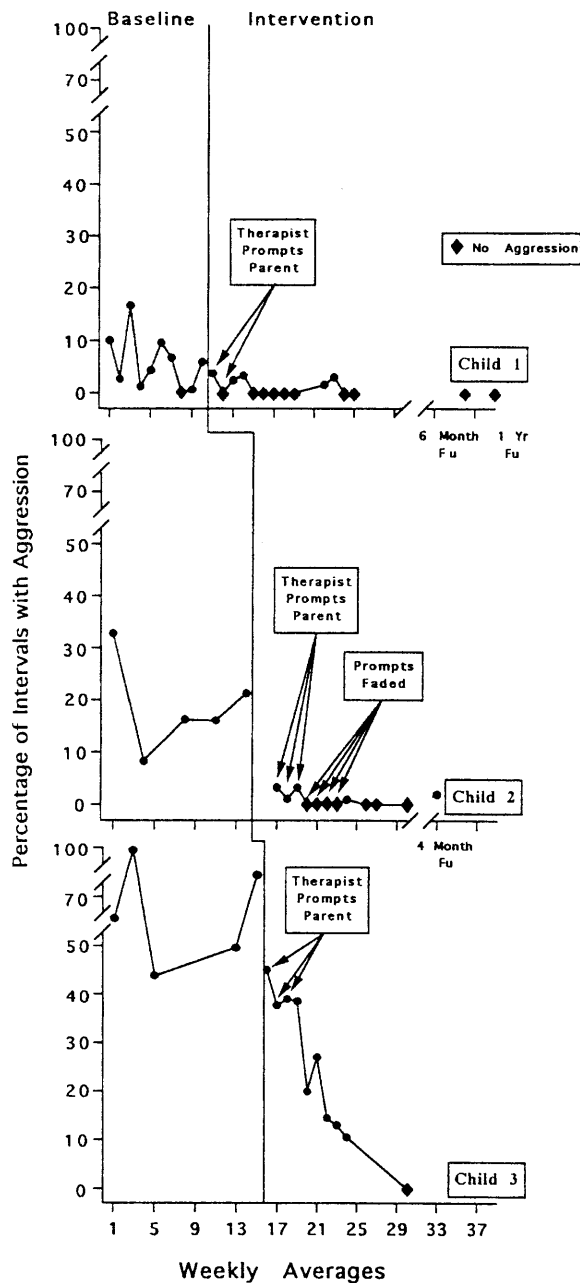


Figure 1. The percentage of intervals during which the children exhibited aggression toward their infant or toddler siblings during baseline, intervention, and follow-up. Arrows indicate sessions when the parents were prompted to provide the intervention. Diamonds indicate sessions with zero aggression.

children. That is, Child 1 demonstrated no aggression at the 6-month and 1-year follow-up periods. Similarly, aggression was near zero during a 4-month follow-up session for Child 2. Child 3 moved away and was unavailable for further data collection. In summary, all of the children's aggressive behavior decreased after intervention, and follow-up sessions suggest the effects of the intervention were durable over time.

### Spontaneous Use of Targeted Appropriate Behaviors

All three children increased their spontaneous use of the relevant appropriate behaviors after intervention. For Child 1, baseline data indicate that the average number of spontaneous appropriate behaviors was 0.5 per weekly session, increasing to an average of 1.5 per session during the intervention sessions, and increased further to an average of 5.5 per session during the follow-up sessions.

For Child 2, the results indicate an average of 0.7 spontaneous appropriate behaviors per session during baseline and increased to an average of 1.3 per session during intervention. Follow-up data showed an additional increase to an average of 4 appropriate behaviors per session.

Child 3 had an average of 0.1 targeted spontaneous appropriate behaviors per session during the baseline sessions and an average of 4.9 targeted spontaneous appropriate behaviors per session during intervention. Because he moved to another state, follow-up data were not available for this child.

### Social Validity

Changes in the children's and parents' happiness levels and strangers' comfort levels occurred. The average levels increased from the unhappy/uncomfortable level (0–1.5) or neutral level (1.6–3.5) during baseline to the happy/comfortable level (3.5–5) by the follow-up period. Specifically, Child 1's level of happiness increased from an average rating of 2.0 (low neutral) at baseline to 3.0 during the intervention and to 4.0 (happy) during follow-up. Her parents' level of happiness was rated at an average level of 2.0 (neutral) during baseline and increased to an average of 4.0 (happy) during the intervention and remained at 4.0 during the follow-up. Similarly, the stranger's comfort level increased from an average rating of 2.5 (neutral) during baseline to a rating of 4.0 (comfortable) during the intervention and remained at 4.0 during follow-up.

Child 2's level of happiness was rated at an average of 2.5 (neutral) during baseline increasing to an average of 3.5 during the intervention and 4.0 (happy) during follow-up. The parent's happiness level increased from an average of 1.5 (unhappy) during baseline to an average of 3.0 during the intervention and to 5.0 (happy) at follow-up. In addition, the stranger's comfort level increased from an average of 1.5 (uncomfortable) at baseline to an average of 3.0 during the intervention and 4.0 (comfortable) during follow-up.

The additional measure of parent-parent conversation obtained for Child 1 during dinnertime when all of the family members were present showed increases from an average of 8.9% of the intervals with conversation during the baseline, to 13.6% of the intervals with conversation during intervention, and to 22.4% of the intervals with conversation during follow-up. That is, dinnertime conversation between the mother and

father occurred more frequently as the child with autism's aggression toward her sibling decreased.

## Discussion

The results of this study showed that changing contextual stimuli associated with aggression through functional analysis and functional communication training with relevant ecological manipulations could be an effective treatment for children with autism who aggress toward their infant or toddler siblings. In this study the most frequent stimuli and their hypothesized function was generally clear, making the process straightforward. However, for families where there are multiple functions or less easily identified stimuli associated with aggression, the functional assessment process may need to be formalized. This study is unique in that it demonstrates the possibility of effective parent-implemented, in-home, ecobehavioral interventions to reduce severe and often dangerous levels of aggression between children with autism and their infant or toddler siblings.

Results from this study also show several interesting collateral effects. Higher levels of positive affect at follow-up suggest an overall increase in happiness for the children and their parents. Thus, targeting disharmony in the children's interactions may result in the indirect effect of improving overall harmony for the entire family. The increase in parent conversation at mealtime for Child 1 and the parents' increased level of happiness also may be an indication of increased marital satisfaction (Brody, Stoneman, & Burke, 1987) and may be an interesting area for future research.

The individual demonstrations in this study further support the conclusions of other studies, suggesting that in-home behavioral support plans can be both efficient and effective, although there are some limitations in this study (e.g., a possible decreasing trend in Child 1's baseline, and that Child 2 and Child 3's baseline were staggered by approximately the same number of weeks). The parents in this study selected the naturally occurring daily activities that were problematic for each of their children (mealtime for Child 1 and play periods for Children 2 and 3). Then, embedding the intervention into the families' naturally occurring routines (i.e., mealtime and play periods) may have been particularly important, because it provided a context in which to support and build, thereby increasing the likelihood of successful implementation (Albin, Lucyshyn, Horner, & Flannery, 1996). Intervention programs that are developed with consideration of family goals, desires, and values, and that do not require significant changes in the existing family routines, are more likely to be consistently implemented and maintained over time (Albin, Lucyshyn, Horner, & Flannery, 1996; Koegel, Koegel, Kelleghrew, & Mullen, 1996).

In addition to selecting the problematic activities, the

parents in this study assisted in developing alternative replacement behaviors that were manageable for both the child and the parent. The parents' active involvement in prioritizing problematic activities and in developing and implementing the treatment program may have resulted in a good contextual fit (Albin, Lucyshyn, Horner, & Flannery, 1996), and thus may have increased the likelihood of successful outcomes (Mullen & Frea, 1995; Wood, 1995). Future research studies relating to parent-professional collaboration and programs implemented in natural settings may contribute to understanding variables related to improving the overall quality of life for all family members.

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