EFFECTS OF SIBLING TRAINING ON IN-HOME APPLIED BEHAVIOR ANALYSIS PROGRAMS AND ATTITUDES TOWARD CHILDREN WITH AUTISM

By

Kristen N. Kelley

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EFFECTS OF SIBLING TRAINING ON IN-HOME APPLIED BEHAVIOR ANALYSIS PROGRAMS AND ATTITUDES TOWARD CHILDREN WITH AUTISM

by

Kristen N. Kelley

Approved by:

Mary B. Gruber, Committee Chair

Deborah K. Ewen, Committee Member

Bettye S. Elmore, Committee Member

William M. Reynolds, Graduate Coordinator

Christopher A. Hopper, Dean for Research and Graduate Studies
ABSTRACT

EFFECTS OF SIBLING TRAINING ON IN-HOME APPLIED BEHAVIOR ANALYSIS PROGRAMS AND ATTITUDES TOWARD CHILDREN WITH AUTISM

Kristen N. Kelley

The purpose of this study was to investigate the effectiveness of a training program designed for siblings of children with autism. The training program attempted to educate siblings about autism and teach them some skills they may be able to use when interacting with their autistic brother or sister. In addition this training attempted to improve the attitudes of the siblings toward children with autism.

The effects of sibling training on maladaptive behavior of children diagnosed with autism were examined before and after a one-day workshop on behavior therapy and autism. In addition, siblings’ attitudes toward the autistic child before and after the training were examined. Curricula included basic principles of applied behavior analysis and discrete trial training, as well as basic education on what autism is and the variety of ways it may manifest itself in an individual. Previous research in this field has shown positive effects on behavior as a result of parent training. Parent training is believed to provide the child diagnosed with autism with non-therapeutic relationships that have greater similarity to the therapeutic environment, resulting in greater consistency in behavior change and more effective treatment. It was therefore hypothesized that similar results would be found after training of siblings. Furthermore it was hypothesized that the additional effect of an improved attitude toward the autistic child would occur.
thereby increasing the likelihood of positive and constructive interactions between the sibling and the autistic child.

The training workshop was administered to siblings of children with autism who are currently receiving in-home behavioral support. The training group consisted of 4 siblings ranging in ages from 8 to 14 years. Two groups of two siblings each were formed based on age level and participant availability, in one training pairing two siblings that are close in age, and in the other training pairing two siblings from the same family. Using a multiple-baseline design, two training sessions were administered at different times, one for each set of two siblings. It was hypothesized that the sibling training would demonstrate that when siblings are provided with information and skills in the area of behavior analysis and autism, their attitudes toward autistic children would become more positive, they would interact more frequently and positively with their autistic sibling, and the frequency and intensity of maladaptive behavior exhibited by the autistic child would decrease. A further implication of this study is that sibling training will assist in further success of in-home behavioral support plans and in the creation of behavioral programs.

The results of this study indicate changes in the predicted direction of the hypotheses. Although no significant changes were found regarding the siblings’ attitudes becoming more positive toward the child diagnosed with autism, as well as the siblings and client having more positive interactions as a result of the training, the results indicate a trend toward the direction predicted by the researcher. Siblings 1 and 3 showed a decrease in perceived social distance among family members at posttest and follow-up.
when compared to pretest scores. Although total scores for all siblings were not significantly lower, indicating less perceived social distance, the results were once again in the predicted direction. It was also observed that after the intervention the parents reported giving both the sibling and the client more equal attention when compared to pretest. Further results showed significant reductions in rate of maladaptive behavior in Client 2 and Client 3. Client 2 showed a significant decrease in Verbal Outburst and Escape behavior after intervention when compared to baseline rates. Client 3 showed a significant decrease in Verbal outburst, Escape, Noncompliance, and Overall rate of behavior after intervention when compared to baseline rates. The results of this study indicate that sibling training may have positive effects on the siblings’ attitudes toward the child with autism, assisting in creating more positive interactions between the sibling and client, as well as decreasing the maladaptive behaviors displayed by the client, but future research should be conducted to further validate these trends.
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INTRODUCTION

Statement of Purpose

Growing up with a brother or sister who has been diagnosed with autism can be a tremendously difficult experience. More and more families are being faced with the trials that are associated with having a child with an autism diagnosis. The prevalence of autism has increased significantly in the last decade. In 2007 the Centers for Disease Control and Prevention reported that 1 in every 150 children are on the autism spectrum. As reported by Fighting Autism, in 2000 there were 93,650 reported cases of children ages 3 to 22 diagnosed with autism, while in 2006 that number jumped to 259,705 reported cases. With such a rise in the prevalence of autism spectrum disorders, it is of great importance that families who have a child with autism are supported and the best possible treatments for the child and their family members are provided. Often the autistic child becomes the focal point of a family structure, with that child needing increased attention and support. Providing such support and attention can leave caregivers feeling exhausted and overworked. Due to such circumstances, other children in the family are often looked upon to play a more active role in the running of their own lives, and to sacrifice some of the attention and support they themselves may have otherwise received from the primary caregivers. Families also tend to look outside of the immediate family for additional services and assistance in providing programming and training for their autistic child. This increased community support can provide the
autistic child with skills they will be able to utilize in their daily lives in the hopes that someday they will be able to function independently or with minimal assistance in society. Siblings of these children may become overwhelmed and resentful by the amount of attention that their brother or sister is receiving and may feel as though they are expected to care for themselves at a very early age. With all of the services that are provided, it can be hard to understand what exactly is going on, especially for another child in the home. For these reasons siblings may have negative attitudes or a great amount of confusion about what exactly is different about their brother or sister and why they themselves do not receive the same amount of attention.

It was the goal of this study to provide information about autism and the basic principles of applied behavior analysis (ABA) to the siblings of autistic individuals who are currently receiving in-home behavioral services, in the hopes that they will become more involved in the family structure and have a better understanding of the needs of the autistic individual. Furthermore, this study hoped to address the negative attitudes that siblings may hold toward the child with autism and through the training procedures attempt to improve those attitudes. A paper and pencil survey was used both before and after the training took place to further investigate the possible changes in attitude. It was believed that through education and increased awareness, the sibling would feel as though they have a more important role in the family structure, and that the negative attitude or resentment toward the autistic individual would decrease, and the sibling interactions would become more frequent and positive. In addition, due to the decrease
in the sibling’s negative attitude, as well as their increased education on ABA and autism, it was hypothesized that the maladaptive behavior of the autistic children would decrease.

A review of the literature is included to further investigate current information on autism, applied behavior analysis based treatment programs, and training programs for parents, caregivers, and siblings.

_Autism_

All of the participants in this study are the siblings of a child diagnosed with autism. Autism is a developmental disorder characterized in the _American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders_ (DSM-IV, TR, 2000) as a pervasive neurodevelopmental syndrome that encompasses deficits including language impairment, resistance to change in environment and routine, impairment of social skills and responsiveness to people, as well as a restricted range of activities and interests. The way autism manifests itself within an individual is extremely variable. Developmental and chronological ages may not seem to match up, and the severity of the manifestation may be dependent on one or both of those ages. Language impairment may encompass both verbal behaviors and nonverbal behaviors such as a lack of eye-to-eye gaze, facial expressions, and body gestures. Verbal behaviors may be limited to vocal approximations, sounds, or no verbalizations at all. Other individuals may have a larger repertoire of words and phrases and be able to use them in appropriate situations and environments. Other observable behaviors may include self-stimulatory behavior such as spinning, flapping of hands, or rocking; abnormal responses to a variety of
stimuli from others as well as the environment; and the need for items and events to follow a particular pattern. Social interactions are often difficult for individuals diagnosed with autism, and behaviors displayed are many times inappropriate in the particular context.

Conversational skills are often an area of impairment. As noted in a study conducted by Capps, Kehres, and Sigman (1998), when comparing children on the autism spectrum and those with other developmental delays, those on the spectrum usually ask fewer questions, and exhibit lower rates of responding and less communication as a whole. The literature does not pinpoint one cause of autism or one treatment. In addition the literature reflects the diversity of the diagnosis and shows that autism can take many different forms in many different individuals.

The procedures for diagnosing autism are improving, with early detection becoming more frequent, and with early detection comes early intervention. Some of the behaviors associated with autism are even said to be detectable by one year of age, including social gaze and orienting oneself to stimuli (Dawson & Osterling, 1997). Individuals diagnosed with autism may manifest behavior in a variety of ways in addition to the above impairments. Maladaptive behaviors may include aggression, elopement, non-compliance, self-stimulatory behavior, tantrums, and property destruction. These behaviors can be viewed by others in the individuals’ environment as being socially unacceptable, therefore at times further alienating the individual from communities and society. What is not usually understood by the community and even families is that such maladaptive behaviors are often a form of communication for the individual. The child
diagnosed with autism may engage in such behaviors or others as a result of deficits in communicating, relating, and cognitive processing (Greenspan & Weider, 2006). Research has been done to assess the best way to identify the needs the individual is attempting to communicate, and functional communication assessments have found to be beneficial. In a study conducted by Durand and Carr (1992) functional communication assessments were conducted for three individuals, and the results showed that for each maladaptive communicative behavior, a new, adaptive, replacement behavior was possible for the individual. Such interventions are often a part of behavioral training programs and treatment plans.

*Treatment Based on Applied Behavior Analysis*

Baer, Wolf, and Risley (1968) defined applied behavior analysis (ABA) as the "science in which tactics derived from the principles of behavior are applied systematically to improve socially significant behavior and experimentation is used to identify the variables responsible for change". The authors went on to discuss the seven dimensions of applied behavior analysis, which are being applied, focusing on behavior, using an analytic process, taking a technological procedure, being conceptually systematic, being effective, and having generality. Individuals with autism can benefit from having a program based on applied behavioral analysis as part of their lives, no matter where they may fall within the spectrum of the disorder. A variety of program options are available for families to utilize, often dependent on what exactly they want the focus of their child’s therapy to be. Some programs offer intensive social skills
training while others offer what is known as floor time training. Floor time is usually set up as a client initiated program and focuses primarily on play skills and imitation. Applied behavior analysis programs utilize aspects from a wide variety of programs, providing the client with comprehensive training in all areas of development. Each program is created on an individual basis dependent on needs and deficits of the child, yet uses similar techniques, procedures, and theories throughout all programs.

As discussed by Cooper, Heron, and Heward (2007), ABA is implemented in numerous domains, one being professional, in-home behavioral treatment. It is the goal of the professional to provide frequent opportunities to their client in which they can use the skills they are learning in order to assist in the permanent acquisition of the skills. Such opportunities are provided in structured as well as naturalistic environments, in an attempt to have the client generalize their acquired skills and implement them as a part of their daily routine and lives.

Furthermore, applied behavior analysis programs often work on skills such as imitation, life skills, academics, functional communication, and social skills. When teaching skills to individuals with autism, using an ABA approach, skill sets or larger skill objectives, such as communication, are broken down systematically, and introduced step by step. Each additional step in the sequence is not introduced until the client has successfully acquired the skill before it. Reinforcement is at the core of all ABA programs and is used in a variety of ways. Reinforcement schedules are set up for clients and are carried out based on what is expected of the client in terms of performance. Positive reinforcement is a method in which something is presented after a behavior that
in turn increases the probability of the behavior occurring again. Reinforcement is used in a variety of ways in ABA programs. With positive reinforcement, the therapists identify items and or activities that are desirable to the client and provide them with that item or activity on different schedules contingent upon adaptive behavior such as correctly responding to direction. A therapist may provide the client with a break from working after 15 correct responses, for example, in the hopes that the frequency of correct responding will increase. Many programs feature token programs in which the client earns tokens based on performance in skill acquisition or lack of maladaptive behaviors. The immediate reinforcement with tokens is used to increase the likelihood of appropriate behaviors occurring. The tokens are later exchanged for other back-up reinforcers of value to the client.

Many studies document the effectiveness of ABA in teaching skills to children with autism. In a study conducted by Zanolli and Daggett (1998), for example, a child diagnosed with autism showed an increase of social initiations when the rate of contingent reinforcement was high, and these findings again show that reinforcement can be a very powerful tool in teaching skills to children on the spectrum. Extinction is also a tool utilized in ABA programs in an attempt to decrease the frequency of maladaptive behavior occurrences. Extinction is a process wherein reinforcement for a behavior is discontinued, the goal being to decrease the frequency of the behavior to an acceptable rate. When both reinforcement and extinction are used appropriately and consistently, change in both behavior and skill acquisition can occur at a steady rate. Often times therapy session times are the only times of the client’s day in which both reinforcement
and extinction are used carefully and consistently. Due to the fact that the therapist cannot be with the client at all hours of the day and in all environments, it often takes longer for changes to occur. Non-therapy conditions often include reinforcement delivery that may be inconsistent and even counterproductive. In reacting to situations, actions, and behaviors, family members may inadvertently reinforce a behavior that is undesirable, therefore strengthening a behavior that in the therapy condition is being extinguished. Family members may also neglect to positively reinforce desirable behaviors when these occur.

*Parent, Caregiver, and Sibling Training*

Although research has been conducted to assess the emotional and other effects parents have as a result of having a child with autism, as well as to assess the effects of training parents and caregivers, little has been done in terms of analyzing the way this situation affects other members of a family structure, more specifically the siblings of these children.

Having a child with autism can be a stressful situation for parents. The emotional strains are usually higher on this population than those of typically developing children or children who are diagnosed with other disabilities. One research study conducted by Dumas, Wolf, Fisman, and Culligan (1991) found just that. Their results showed that parents of children with autism have significantly higher stress levels than do parents of children with Down syndrome as well as parents of children free from any diagnosis. Additionally, this study found that mothers with children with an autism diagnosis have
statistically higher rates of dysphoria than mothers in both of the other populations participating in this research.

Lessenberry and Rehfeldt (2004) discussed further implications that parents of children with autism face. Their article discusses the higher rates of depression and parenting difficulty found among mothers with autistic children when compared to parents of typically developing children and children with diagnoses other than autism. The authors also discussed the implications such results can have on their children and the services they receive. Lower levels of parenting competency may affect the interactions the mothers have with their child and therefore may hinder the possible positive effects of treatment.

Previous research by Ewen (2003) and Wood (2004) showed that when parents were trained in the principles of applied behavior analysis, their confidence levels increased, their stress levels decreased, and their observed use of appropriate reinforcement behaviors in interacting with the child increased as well. The researchers also found that the participants displayed significant increases in self-confidence in specific areas, including teaching their children self-help skills and personal safety skills. Furthermore, when participants were observed by the researcher, they displayed a higher percentage of positive reinforcement in contrast to negative feedback at follow-up when compared to baseline percentages.

Studies focusing on the effectiveness of parent and caregiver training in ABA principles have also shown some results that may lead us to believe it could be useful tool for siblings as well. Koegel, Symon, and Koegel (2002) reported on the results of a
week-long parent training. Their results supported the hypothesis that parent training can improve the overall treatment and success of the client. They found that after the training the parents’ ability to implement the skills taught increased, and the parents’ positive affect also increased. Perhaps more notably the researchers saw an improvement in the clients’ expressive language both during and after the training. The follow-up measures were conducted in the home, and all of the outcomes seen in the training environment were generalized to the home environment. Findings such as these indicate that parent training can play a positive role in the overall treatment of the client.

Few studies have been done that investigate the siblings’ role as a family member of someone with a diagnosis of autism. Just as emotional strains and stressors are seen in the parents and caregivers, siblings are affected. One study that does investigate the impact on the siblings was conducted by Kaminsky and Dewy (2001) in which they investigated the sibling relationships in families with children diagnosed with autism in comparison to those with other disabilities such as Down syndrome and siblings of typically developing children. The study found that sibling pairs in families with children on the autism spectrum had less intimate relationships, demonstrated less prosocial behavior, and behaved in a less nurturing way than siblings of children with Down syndrome and normal functioning children. The article goes on to discuss how relationships between siblings are of extreme importance and can offer a crucial support system. These relationships can also assist in the development of social skills. Providing siblings with the tools they need to successfully interact with their brother or sister can benefit all parties involved and may also have an impact on later development. Not only
are siblings a participating member in the family structure, but they also have the ability to impact the life of their autistic sibling and allow themselves to live a life with a more positive attitude toward them.

Healy’s (2005) book, which she created for siblings of children with autism, points out that the perspective from the eyes of the sibling may be very different than that of other individuals both within and outside of the family. This book is a story about what it is like to have a brother with autism and is an informational tool for other siblings. It discusses the fact that sometimes even when the sibling is the younger of the two brothers, many times the siblings has to take on the role as the older brother, as well as the fact that at times it may seem as though children on the spectrum do not want to play, while this in fact may not be true. Often times children with autism just don’t know how to play with others as typically developing children do. Resources such as these can be a tool used when training or simply discussing autism with a sibling.

Mathew, Leong, and Whit (2007) looked closely at the feelings and thoughts siblings have about autism and their family structure in terms of their development. They pointed out that in the early childhood stages, siblings may understand that there is something different about their brother or sister in comparison with themselves, but they still expect to have a typical relationship and interactions. Siblings may also have misconceptions about how the disability developed, and in some cases they may fear “catching” the disability.

Harris and Glassberg (2003) discussed the important roles siblings have in the autistic child’s life through each stage of development. Siblings in early childhood often
experience feelings of sibling rivalry but may grow to become a model for their brother or sister. It is here that the groundwork for a relationship is created. In middle childhood the siblings are often one of the most important resources in terms of emotional support for the client, working in conjunction with the parents. Finally, in adulthood the sibling continues to play an import role, often times having to take on increased or sole responsibility for the autistic individual as the parents or primary caregivers are no longer able to provide adequate care.

The self-efficacy of the sibling may be at slight risk as well. O'Kane-Grissom and Borkowski (2002) conducted a study in which adolescent siblings of children with disabilities were compared with adolescent siblings of typically developing children. The two groups were compared on measures of self-efficacy and competence with peer relationships. The research found that prosocial behavior, interpersonal confidence, maternal attitudes, and peer competence was directly related to self-efficacy for those adolescents who have siblings with disabilities, while for those who did not have disabled siblings self-efficacy was only directly related to interpersonal confidence.

Siblings of children with disabilities have more challenges in terms of developing self-efficacy than do siblings of typically developing children. It is therefore imperative to assist them and provide them with appropriate strategies to engage in positive relationships in order to assist in healthy development. Later in development, specifically in young adulthood, the sibling may begin to resent the amount of responsibility placed on them as a result of having a brother or sister diagnosed with autism. This resentment may be directed at a variety of individuals, including those within the family structure or
professionals involved in the families’ life. Such feelings and actions may result in strained relationships that are difficult to overcome, and even feelings of guilt as a result of their resentment, thus making it crucial to provide siblings with the information and tools to cope with the circumstances as well as to lead a productive and happy life while maintaining positive relationships.

Harris and Glassberg (2003) discussed the opportunities available when considering having the siblings of children with autism act as teachers. Sibling participation can be very beneficial when teaching children with autism play skills. It is noted in their text that it is always important to take the sibling’s age into consideration when planning what type of information you hope to bestow upon them, making sure to keep it developmentally appropriate and to keep the skills attainable. Their book continues to discuss how often times this interaction between client and sibling is enjoyable for both parties involved. Such positive interactions can be a great building block for a successful relationship both now and in the future.

In the little research that has been done in the area of sibling training, Schreibman, O’Neill, and Koegel (1983) provided sibling training participants with a set of general behavioral modifications skills such as teaching discrimination and expressive labeling. In addition, the researchers presented the siblings with the basic concepts of reinforcement and extinction in conjunction with information on how to use them in their response to behaviors displayed by the child with autism. The skills offered in the training were ones that would be functional skills and require little response effort to carry out in multiple settings and in response to an assortment of target behaviors.
exhibited by the autistic child. The researchers were specifically interested in whether the siblings would have the ability to not only learn the techniques presented in the training but also to carry them out in non-training conditions. Furthermore this study investigated the effects such training and acquisition of skills on the part of the sibling would have on the behavior of the child with autism. The results of this study showed that when given the opportunity to learn behavior modification techniques, siblings were able to use them with success, and furthermore they were able to generalize their knowledge to a variety of situations and environments. Such success by the siblings also accompanied a marked improvement in the behavior of the autistic child. Just as notably were the increased positive social interactions between the normally functioning sibling and the child with autism. The results also included an increase in positive statements regarding the autistic children from their siblings.

Education and training are important aspects of any behavioral program and need to be available to all members of the autistic individual’s support network, but a higher priority should be placed on providing the immediate family with such skills and knowledge in order to provide all members of the family with a positive, growing, effective way of living.

Current Study and Research Questions

The current study provided training for siblings of children diagnosed with autism. In this training, information on autism, behavior, positive reinforcement, extinction, and play skills was provided. This study measured the attitudes of the siblings
(Sibling Survey) and the perceived social distance (Social Distance Scale) between the sibling and his or her parents as well as the client. It also measured the parents’ perceptions (Parent Survey) of their children’s interactions. In addition this study examined the record of maladaptive behavior of the client (Behavior Data Sheet) to observe any changes before versus after the training.

The research hypotheses included the following:

1. The attitudes of the siblings toward children with autism, as measured by the sibling survey, will be more positive at posttest and follow-up after sibling training, relative to pretest before training.

2. The behavior of the sibling toward the client as measured by the sibling and parent survey scales, will be more positive at posttest and follow-up, relative to pretest.

3. The sibling’s perceived distance between family members would decrease, as measured by the Social Distance Scale, indicating greater family closeness.

4. The maladaptive behaviors of the client children, as recorded by the client’s therapists, will decrease after the training, compared to baseline before the training.

It was expected that the training would provide the sibling with knowledge and skills that would in turn change their attitudes toward the client and increase positive interactions between the sibling and client. It was also expected that due to the increased positive interactions between the sibling and client, the maladaptive behavior of the client would decrease from the beginning of the data collection period to the end of the study.

Thus it was hypothesized that the siblings’ scores on the written surveys would become more positive from pretest to posttest and follow-up. Additionally, it was
hypothesized that the frequency of maladaptive behavior on the part of the client would decrease from baseline to after intervention.
METHOD

Participants

The participants in this study included the siblings, who filled out surveys and attended the sibling training, and their parents, who participated by filling out surveys. The children diagnosed with autism, also referred to as the clients, are also considered participants; however, they did not have any direct interaction with the researcher and only their on-going behavior data that is regularly collected by the client’s PCFA therapist was used. The participants in this study were 4 siblings of children diagnosed with autism who are receiving applied behavior analysis services through Pacific Child and Family Associates (PCFA) in Humboldt County, California. Their ages were between 8 and 14 years of age, and the group included 3 girls and 1 boy. There was space for up to 10 siblings of children diagnosed with autism to participate in the training, but due to a small group of interested participants and time conflicts only 4 siblings participated.

Two female sibling participants attended the first training. The first sibling participant is 10 years of age and lives with both of her parents as well as her younger brother who is the child diagnosed with autism. The training participant’s younger brother is 8 years of age and was diagnosed with autism at age 3. Both the mother and father in this family participated by filling out surveys. The second sibling participant is 9 years of age and lives at home with her mother and father, as well as her younger
brother who is 5 years of age, and was diagnosed with autism at age 4. The mother in this family participated by filling out surveys.

For the second training two siblings of one child diagnosed with autism attended. The siblings consisted of one boy, who is 8 years of age and one girl who is 14 years of age. The siblings as well as the child diagnosed with autism, a boy who is 7 years of age, live at home with their mother, father, and one older sister who is 18 years of age. It has been reported that their father is out of town frequently and often for extended periods of time. The mother in this family participated in the research by filling out surveys.

**Measures**

The Sibling Survey, created by the researcher, (Appendix E) is a written survey that asks questions regarding the frequency of interactions between the sibling and client, general attitude toward the client, feelings regarding family interactions, and use of basic ABA techniques. The survey was written in language expected to be understandable to the youngest siblings that would be involved in this research. A Likert scale format was used. The Likert scale provided the participants with five response options to select as their answer. Each scale had numbers from 1 through 5, that were each associated with an answer. Some questions had a response scale from 1 “Not at all” to 5 “Always”, and other questions had a scale from 1 “Never” to 5 “Everyday”.

The Parent Survey, created by the researcher, (Appendix F) is a written measure that asks parents questions about the frequency and type of interactions their children
engage in, and possible interactions they would like to see between their children. The same Likert scale format as used in the Sibling Survey was used in this measure.

The Social Distance Scale, adapted by the researcher (Appendix G) was also used in this research. The social distance scale is a paper and pencil scale designed to measure the perceived distance between the sibling and his or her parents, as well as the perceived distance between the sibling and the client. Additionally, the hypothesized distance between the client and his or her parents as perceived by the sibling was measured. This scale was modified for each sibling, inserting “brother” or “sister” as well as making modifications to “mother figure” or “father figure” based on their family structure. This social distance scale is similar in format to other measures of social distance (Long, Henderson, and Zeller, 1965; Crane, 2005).

In addition to the above measures, behavioral data sheets (Appendix H) were used to track the frequency of each client’s target behaviors during in-home sessions. Each client has behavior data sheets that are tailored to identify and track specific undesirable behaviors exhibited by that individual. During each in-home session PCFA therapists tracked the frequency of each non-desirable behavior by making a tally mark in the corresponding box for each therapy day. For each therapy day, the behavior frequency was divided by the session hours to obtain the rate of behavior per hour.

Materials

The materials used in this study included all of the written measures, behavior data sheets that are currently being used in each home program, and two handouts, one
containing an outline of the training topics and the other basic information about autism, reinforcement, and extinction. The researcher also utilized the Healy (2005) book *Sometimes My Brother: Helping Kids Understand Autism Through A Sibling’s Eyes* during the training. A variety of toys and games were used in role play scenarios and when discussing different useful behaviors the sibling could use with their brothers. The toys and games used for the training included a simple board game that all families that receive PCFA services have access to, as well as blocks, trucks, a card game, and puppets. Each sibling was given toys from the training to take home with them in an attempt to facilitate interactions with the child with autism, as well as to promote generalization from the training environment to the home setting. The game that was used would also be taken out to each house in the future, and the sibling would have access to it and if they desire could initiate a game with their brothers. This would hopefully promote generalization as well as provide the sibling with a concrete activity, in which they were trained, to use as a tool to engage in an activity with their brother.

**Procedure**

Participants and their families were notified of the training through a mailing distributed to all of the families who receive services through Pacific Child and Family Associates in Humboldt County (Appendix D) and who meet the requirements set forth by this study. Families who displayed interest in participating through a form returned to the researcher were contacted and times were established that worked for each family. Two separate trainings were conducted on two different Saturdays starting at 9:00 am and
ending at 2:00 pm and 12:00 pm respectively. Upon arriving to the Humboldt State Psychology Clinic, located in the Behavioral and Social Sciences Building, at the designated time for the training to begin, the researcher and the parents met in the conference room, while the sibling participants went with the research assistant into the play therapy room of the clinic. While in the conference room the researcher asked the parents to fill out an informed consent form (Appendix A) which included details of the study and its procedures; it also included information such as participants’ rights and confidentiality of results, and the Notice of Privacy forms (Appendix K) created by PCFA. Next, the sibling participants were asked to complete informed assent forms (Appendix B) in the play therapy room of the clinic. After all informed consent and assent forms were completed, the parent participants and the sibling participants were given the pretest surveys (Appendix F & E respectively) while still remaining in separate rooms in the clinic.

After completion of the pretest surveys the parent participants were free to leave the clinic and were asked to come back at 2:00 pm to pick up their child, unless the training concluded at an earlier time, which occurred during the second training, at which time the parents were contacted and the sibling participants were picked up earlier. At this time the formal training began with the siblings and researchers gathering in the play therapy room in the Psychology Clinic.

The first training was co-led by Kristen Kelley, B.A., Deb Ewen, M.A., BCBA, Clinic Director of PCFA, as well as research assistants Kimberly Altic, B.A., and Jennifer Wahlund, B.A., who are also Behavior Therapists with PCFA. The second training was
co-led by the primary researcher, Kristen Kelley, B.A., and Kathryn Martinez, B.A. who is also a Behavior Therapist with PCFA. All of the research assistants have been trained in the principles of behavior analysis through their employment with PCFA. In addition they each have at least two years of experience working with children diagnosed with autism and their families. Before each training the primary researcher met with the research assistants for two hours and went over all of the material that would be covered in the training. Each of the topics and behavior analytic principles that would be presented in the training were discussed as well as the overall structure of the training.

The research assistants and the primary researcher also discussed the rationale behind the research, important research that had previously been conducted in the area of sibling training, all of the measures and materials that would be used, and specific instructions on what their role was to be. Furthermore, the primary researcher and the research assistants practiced all of the role-play scenarios prior to the training to make sure that everyone understood what the goals and objectives were. Throughout the course of the training the research assistants followed the lead of the primary researcher and interjected information for their own experiences when needed and appropriate. The research assistants also conducted the role-plays with the siblings while the primary researcher provided feedback.

One week following the training the siblings and their parent were mailed follow-up written surveys and evaluation forms to be filled out and returned to the researcher. The surveys were mailed in separate envelopes to the parents and the siblings, and a
stamped return envelope was provided with each person’s survey. Once the follow-up surveys were completed and returned, their participation in the study concluded.

Throughout the entire process of the study, the client’s behavior data was collected by therapists as part of their usual routine. Behavior plans for the child with autism remained consistent throughout the study. The actual targeted behaviors and operational definitions were stated for each child.

Participant names on all data collected throughout the process of this study, including all written surveys and behavior data were transformed to number codes so that the information gathered would not be able to be tracked back to the participants. The number codes were also placed on the envelope of the surveys that were mailed to the participants, and return envelopes included the researcher’s address for both the primary and return addresses. Number codes were given to each participant when they completed the initial survey so that no names would be gathered in the data collection process. No names were used in reporting the results of this study.

*Intervention*

At the beginning of the workshop, each researcher and the siblings introduced themselves briefly, and then the group engaged in a getting to know you game that consisted of asking “What’s your favorite…” questions and each member of the group answered. Topics such as favorite sport, food, color, animal, and game to play with the children with autism were used. The researchers noted the answers the siblings provided, to use later in the role play scenarios or when discussing play skills later in the training.
The primary researcher also discussed her expectations for the training, noting that it was an open forum for questions, comments, and concerns. This was done to help the sibling participants feel comfortable to interject at any portion of the training. After the “getting to know you” portion, the next part of the training commenced.

At this time the researchers discussed common aspects of autism, possible social impairments, communication deficits or differences, possible behaviors, and learning processes (Appendix I). Throughout this segment the siblings were asked in what ways each topic affected their brother in both positive and perhaps negative ways. Stories were shared, and often times the siblings asked questions about how to adapt to the differences between them and their sibling. In all informational areas, real life and applicable examples were provided, such as specific reasons the participating siblings’ brothers with autism engage in non-compliance or escape behavior, as well as communication tools that are used with the specific clients.

The primary researcher also read aloud the Healy (2005) book, *Sometimes My Brother: Helping Kids Understand Autism Through a Sibling’s Eyes*. Each page was discussed and the siblings were asked how they felt about it or if they had ever been in a similar situation. At this time the siblings talked a lot about personal experiences with their brothers and how they feel when different situations occur. Feelings of embarrassment, happiness, and discontent were brought up. The researchers acknowledged the feelings of the siblings and often asked how they would like things to be different and gave some tips as to how the siblings may be able to help achieve these goals with their brothers.
Following this portion of the training, the participants were given a brief break. Once the break had concluded, the siblings were given information about what behavior therapy is, why therapists come into their home, and exactly what types of skills they are working on. At this time the basic principles of reinforcement and extinction were described, and the siblings were given examples of how they can use these procedures as well. The applicable reinforcement and extinction procedures were also practiced in the role-play segment of the training to offer the siblings practice in using the techniques.

A break followed this portion of the training, giving the siblings some time to get to know each other and take a break from the formal training. Each participant had brought their own food to eat during breaks.

The next segment of the training focused on play skills and play interactions between the sibling and the client as well as role-play scenarios (Appendix L). This portion was tailored to each sibling’s interests as well as the capabilities and interests of the client. Behavioral skills training steps as discussed by Miltenberger (2008, pp. 251-269) were used in this portion to assist the researcher in the training of play skills. The steps included verbal instruction, modeling by the researchers, practice by the siblings, and constructive feedback, including praise for good performance and suggestions for further improvement.

During the first training, play skills using a simple board game, a card game, and trucks were practiced. The board game is a non-competitive game that is relatively easy for all ages. It involves rolling a color die and moving the appropriate piece forward one space. The siblings and researchers practiced playing the game, giving each other praise
as reinforcement throughout and giving examples of ways to prompt for success. During the card game, examples of how to modify the game so the client would be able to interact were given, and again the siblings and researchers played the game, with one researcher acting as the part of the client. This gave the siblings an opportunity to practice the skills that had been trained. Finally trucks were used in order to discuss modeling and ways to teach the client new and appropriate ways to play with toys. The researchers also discussed with the siblings that it is important to also play in the fashion that the client plays, therefore letting the client know the sibling is interested in interaction. The researchers also discussed that the sibling should bring their own toy to the situation in an attempt to avoid taking one of the client’s toys and “forcing” upon them a specific way to play or perhaps making the interaction a negative one. It was also noted that after some time interacting with the client, the sibling may then work on sharing of items brought to a play environment.

The play skills trained in the second training were identical to the first, except that trucks and cars are not of interest to the client in this family, so small finger puppets were used. It was identified that the client of focus during the second training is interested in small figurines, and therefore the puppets were chosen. All of the same information and skills as in the first training were presented in the later training.

The same role-play scenarios (Appendix L) were used in both of the trainings and included role-plays focusing on reinforcement, extinction, and also reinforcement followed by extinction. Role-plays focusing on appropriate use of reinforcement were conducted first. Role-play situations in which reinforcement were used included sharing,
greetings, leaving a location, knocking on a door, and play. For each role-play two researchers acted out the scenario and appropriately demonstrated the reinforcement procedure. While the researchers were carrying out the role-play, the primary researcher pointed out the important features to the sibling participants. After the two researchers had concluded the role-play, each sibling had a turn to act out the same scenario with one of the research assistants playing the part of client. Again, the primary researcher gave positive feedback to the sibling and pointed out the key elements of the role-play. In the case of the role-plays focusing on delivering reinforcement, the siblings were also given an opportunity to once again act out the role-play, with each sibling taking turns playing the part of the client. The next section of role-plays focused on extinction procedures, and the role-play situations included the client being aggressive to the sibling, and the client breaking or ruining a toy of the sibling. Once again two research assistants first acted out the role-play as a model for the siblings, and then each sibling was given a turn to participate in the role-play with a researcher acting as the client. For the extinction role-plays, the siblings did not act out the role-play together. For the third set of role-plays, only the researchers acted out the scenarios, and the procedures were discussed with the siblings in conjunction with the primary researcher continuing to narrate throughout all of the role-plays. The topic of focus in this section was the client engaging in yelling behavior which would be put on extinction, but following that up with reinforcement once the client used a calm or quiet voice.

The last section of the training gave the siblings another chance to ask the research team questions regarding the specific dynamics of their relationship with the
client, as well as to discuss personal experiences and make comments about the training. The researchers also reviewed the information that was presented in the training, including the book that was read in the first portion of the day. Final examples of how to use reinforcement were given. The siblings were thanked for coming and reminded that they were free to contact the primary researcher with any questions or comments. The siblings were then asked to fill out the written posttest surveys, as well as the training evaluation form (Appendix J). Once completed, they were free to leave the training with their parents.

Potential Benefits, Risks, and Management of Risks

The purpose of this study was to investigate the effectiveness of a training program designed for siblings of children with autism. The training program attempted to educate siblings about autism and teach them some skills they may be able to use when interacting with their autistic brother or sister. In addition this training attempted to improve the attitudes of the siblings toward children with autism.

There are many potential benefits of conducting this research. Some of those benefits include making a contribution to the literature and knowledge about applied behavior analysis, autism, and sibling training. More specifically, this research was conducted to provide further information on the effectiveness of providing siblings of individuals with autism information about reinforcement, extinction, applied behavior analysis, and autism. The study was also conducted to increase the field of study in the area of attitudes toward individuals with autism and potential methods to improve such
attitudes, and to provide further information regarding the attitudes of siblings and the changes in attitudes from training.

This study was also conducted to provide benefits to siblings, the clients, and other family members. Possible benefits for these individuals include that siblings themselves, with several hours of training with professionals, are expected to obtain peer support, improved relationships between members of the family, increased positive interactions between the sibling and the client, increased play skills for the client, and possible reduction of the client’s maladaptive behaviors. Other benefits could include an improved attitude on the part of the sibling, as well as greater perceived closeness between the sibling and the rest of their family members.

One possible risk in this study related the issue of confidentiality. Confidentiality was maintained in all of the components of this study, including the single subject research of the siblings, the analysis of the behavior data, as well as the attitude scales completed by the siblings. Recognizing the identity of the participants in this study might become possible due to demographics and services provided by a specific agency. All possible steps were made to keep all of the information obtained in this proposed research confidential. Steps to manage risks included the completion of informed consent forms by the parents and informed assent forms by the siblings. In addition all parties were given the option to withdraw from the study at any time. However, no participants withdrew from the research. All responses were kept confidential, and no participant names were discussed in reporting the results of the study. The participants wrote their names in pencil on the surveys, to allow the researcher to match their pretest,
posttest, and follow-up surveys. The participant names were then converted to numbered codes for all further data analysis and reporting. No participant names were used in the report. The set of raw data will be kept in a locked file cabinet for five years, and will then be shredded. All of the behavior data collected will be kept at the Pacific Child and Family Associates office in Eureka, and all other data will remain with the primary researcher.

The training might also cause an interruption in the daily happenings of the family structure and cause accommodations to be made by the family. For example, the parent needed to bring their child to HSU with a prepared lunch on a Saturday and pick their child up several hours later. Such disruptions were kept as minimal as possible, and no complaints were made to any of the researchers.

Another possible risk was that the training might not provide any benefit to the sibling, client, or other family members, therefore making their participation a waste of time. This risk was minimized by teaching the siblings skills that prior research studies indicate are beneficial, and by making their participation not consume a lot of time. After the study completion, the researcher will send the participants a debriefing statement summarizing the findings of the study, thank them for their participation, and invite them to contact the researcher if they have any questions or concerns about the study.

There was also the possible risk that the siblings participating in the training would use the behavioral techniques they learned in a way in which they were not intended to be used and that was not helpful to their brother or sister. This risk was mitigated by the researchers reminding the siblings that the techniques are to be used to
increase positive behaviors and to decrease negative behaviors. This means they should
only use the techniques to reward positive and appropriate behaviors and ignore
undesirable behaviors. The researchers also watched the siblings engage in role-play
scenarios to ensure that they used the techniques presented in the training in the way they
were intended to be used and not in a way that might be counterproductive. The
researchers did not observe any behaviors on the part of the sibling participants that led
them to believe that the participants would use the techniques discussed in the training in
a way in which they were not intended to be used.

A supervising psychology faculty member, Mary Gruber, Ph.D., BCBA, was
present in an adjacent room in the clinic during all sessions. If a child had displayed
strong emotions or concerns during the course of the training, they would have been
referred to the supervisor or other personnel who could be of assistance and could
provide the child with services within their scope of practice. The siblings did not
display any behaviors that would be of concern to the researchers or the supervising
faculty member during the course of the training.

The protocol for this research was approved by the campus Internal Review Board
for the Protection of Human Subjects, with approval #07-75, and the approved protocol
was adhered to in conducting this research.

Analysis of Data

The data were examined in two primary ways. First, consistent with single-
subject analysis, the behaviors for each individual were displayed graphically, as bar
graphs for the responses of the siblings and parents, and as multiple-baseline graphs for the target behaviors of the client children. Second, consistent with statistical analysis, tests of statistical significance were conducted, to test for significant changes in mean responses of the siblings and parents, and also to test for significant differences in each client’s behavioral data points before versus after intervention. All significance tests were two-tailed with the alpha level set at .05.

The siblings completed surveys at pretest, posttest, and follow-up testing. Bar graphs were created to visually present the responses of each sibling on each item at pretest, posttest, and follow-up. Additionally, in order to test for significant changes over time, repeated-measures analysis of variance was used, followed by orthogonal contrasts to compare the siblings’ pretest versus posttest scores and pretest versus follow-up scores, on each of the survey measures.

The parents completed surveys at pretest and follow-up testing. Bar graphs were created to visually present the responses of each parent on each item at pretest and follow-up. Additionally, in order to test for significant changes over time, repeated-measures analysis of variance was used to compare the parents’ pretest versus follow-up scores, on each of the survey measures.

The client children’s target behaviors were recorded by their behavior therapists at each therapy session from March 3, prior to the sibling workshop, to June 7, after the sibling workshop. For each day, the frequency of a target behavior was divided by the number of session hours, to obtain the rate of the target behavior per hour. Multiple-baseline graphs were then created to display the client children’s rate of target behaviors
over consecutive days, with phase lines dividing baseline data points prior to the intervention, from data points after the intervention. Additionally, analysis of variance was used to compare each client child’s data points before versus after intervention, on each of the target behaviors.
RESULTS

Sibling Survey Responses

The individual responses of each of the four siblings on each of the ten items on the Sibling Survey at pretest, posttest, and follow-up are presented as bar graphs in Figures 1-2. The means and standard deviations for each item at pretest, posttest, and follow-up are presented in Table 1. While some of the item means tend to show higher values at posttest or follow-up than at pretest, repeated-measures analysis of variance followed by orthogonal contrasts did not show any significant changes in the siblings’ mean responses, from pretest to posttest or from pretest to follow-up, on any of the items.

Total Sibling Survey scores for each sibling were also calculated by summing the sibling’s item scores. The ten items were all worded positively, such that higher numbers on the Likert scale represented more adaptive sibling responses. (The internal consistency or inter-item reliability, as measured by Cronbach’s alpha on the standardized items, while small at pretest ($r_{\alpha} = .354$), was high at posttest ($r_{\alpha} = .865$) and at follow-up ($r_{\alpha} = .852$). Thus, the Total Sibling Survey score was included as a measure of overall sibling adaptation.)

The Total Sibling Survey scores for each sibling at pretest, posttest, and follow-up are presented in Figure 2. Repeated-measures analysis of variance with orthogonal contrasts did not show a significant change in mean Total Sibling Survey score from pretest ($M = 37.75$) to posttest ($M = 39.75$) and follow-up ($M = 36.75$).
Figure 1. Responses of each of the four siblings on the Sibling Survey Items 1-6 at pretest, posttest, and follow-up.
Figure 2. Responses of each of the four siblings on the Sibling Survey Items 7-10 and Total Score at pretest, posttest, and follow-up.
Table 1
Sibling Survey Measure Group Means, with Standard Deviations in Parentheses.

<table>
<thead>
<tr>
<th>Item</th>
<th>Pretest (n=4)</th>
<th>Posttest (n=4)</th>
<th>Follow-up (n=4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Like playing with client</td>
<td>3.75 (0.96)</td>
<td>4.50 (1.00)</td>
<td>4.00 (1.15)</td>
</tr>
<tr>
<td>2. Often play with client</td>
<td>3.50 (1.00)</td>
<td>4.00 (1.15)</td>
<td>3.75 (1.50)</td>
</tr>
<tr>
<td>3. Know how to play with client</td>
<td>3.25 (1.26)</td>
<td>4.25 (1.50)</td>
<td>3.25 (1.71)</td>
</tr>
<tr>
<td>4. Initiate play activities with client</td>
<td>3.50 (1.29)</td>
<td>3.50 (1.29)</td>
<td>3.25 (1.50)</td>
</tr>
<tr>
<td>5. Praise or reward client</td>
<td>4.00 (0.82)</td>
<td>4.25 (0.50)</td>
<td>3.50 (1.29)</td>
</tr>
<tr>
<td>6. Ignore problem behavior of client</td>
<td>2.75 (1.50)</td>
<td>2.00 (1.41)</td>
<td>2.25 (0.96)</td>
</tr>
<tr>
<td>7. Like therapist coming to home</td>
<td>3.75 (1.50)</td>
<td>4.25 (1.50)</td>
<td>3.75 (1.50)</td>
</tr>
<tr>
<td>8. Take care of client</td>
<td>4.00 (0.96)</td>
<td>3.75 (1.50)</td>
<td>4.00 (0.82)</td>
</tr>
<tr>
<td>9. Get parent attention</td>
<td>4.00 (1.41)</td>
<td>4.25 (0.96)</td>
<td>4.25 (0.96)</td>
</tr>
<tr>
<td>10. Client get parent attention</td>
<td>5.00 (0.00)</td>
<td>5.00 (0.00)</td>
<td>4.75 (0.50)</td>
</tr>
<tr>
<td>Total Sibling Survey Score</td>
<td>37.75 (3.77)</td>
<td>39.95 (7.27)</td>
<td>36.75 (7.27)</td>
</tr>
</tbody>
</table>
Sibling Social Distance Responses

The individual responses of each of the four siblings on each of the six items on the Social Distance measure at pretest, posttest, and follow-up are presented as bar graphs in Figure 3. On each item, higher values represent greater perceived distance between specific family members, while lower values represent greater perceived closeness between those family members. The means and standard deviations for each item at pretest, posttest, and follow-up are presented in Table 2. Analysis of variance with orthogonal contrasts did not show any significant changes in the siblings’ mean distance ratings, from pretest to posttest and follow-up, on any of these items.

Total Social Distance scores for each sibling were also calculated by summing the sibling’s item scores, to obtain an overall measure of perceived distance among family members. (The internal consistency or inter-item reliability, as measured by Cronbach’s alpha on the standardized items, was moderate at pretest ($r_{\alpha} = .515$), and high at posttest ($r_{\alpha} = .766$), and high at follow-up ($r_{\alpha} = .770$). Thus, the Total Social Distance score was included as a measure of overall perceived distance among family members.)

The Total Social Distance scores for each sibling at pretest, posttest, and follow-up are presented in Figure 4. Siblings 1 and 3 showed a decrease in perceived social distance at posttest and follow-up relative to pretest, while Siblings 2 and 4 showed no change. While the group mean distance score was slightly lower at posttest and follow-up than at pretest, analysis of variance with orthogonal contrasts did not show significant change in the siblings’ overall perceived social distance from pretest ($M = 10.00$) to posttest ($M = 9.50$) and follow-up ($M = 9.50$).
Figure 3. Responses of each of the four siblings on the Social Distance Scale Items 1-6, showing their perceived distance between family members at pretest, posttest, and follow-up.
Figure 4. Total Social Distance Score for each of the four siblings, showing their overall perceived distance among family members, at pretest, posttest, and follow-up.
Table 2

Social Distance Measure Group Means, with Standard Deviations in Parentheses.

<table>
<thead>
<tr>
<th>Item</th>
<th>Pretest (n=4)</th>
<th>Posttest (n=4)</th>
<th>Follow-up (n=4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Me to Client</td>
<td>1.25</td>
<td>1.25</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>(0.50)</td>
<td>(0.50)</td>
<td>(0.96)</td>
</tr>
<tr>
<td>2. Me to Mother</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td></td>
<td>(0.50)</td>
<td>(0.50)</td>
<td>(0.50)</td>
</tr>
<tr>
<td>3. Me to Father</td>
<td>2.50</td>
<td>2.50</td>
<td>2.00</td>
</tr>
<tr>
<td></td>
<td>(1.29)</td>
<td>(1.29)</td>
<td>(0.82)</td>
</tr>
<tr>
<td>4. Client to Me</td>
<td>2.25</td>
<td>2.25</td>
<td>2.25</td>
</tr>
<tr>
<td></td>
<td>(1.89)</td>
<td>(1.89)</td>
<td>(1.89)</td>
</tr>
<tr>
<td>5. Client to Mother</td>
<td>1.50</td>
<td>1.00</td>
<td>1.25</td>
</tr>
<tr>
<td></td>
<td>(1.00)</td>
<td>(0.00)</td>
<td>(0.50)</td>
</tr>
<tr>
<td>6. Client to Father</td>
<td>1.25</td>
<td>1.25</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>(0.50)</td>
<td>(0.50)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Total Family Distance Score</td>
<td>10.00</td>
<td>9.50</td>
<td>9.50</td>
</tr>
<tr>
<td></td>
<td>(3.92)</td>
<td>(3.70)</td>
<td>(3.70)</td>
</tr>
</tbody>
</table>
Sibling Evaluations of Workshop

The individual responses of each of the four siblings on each of the three Workshop Evaluation items at posttest and follow-up are shown as bar graphs in Figure 5. The means and standard deviations for each item at posttest and follow-up are presented in Table 3. Siblings 1 and 2 gave especially high evaluations at both posttest and follow-up. The group mean ratings on the items ranged from 3.25 to 4.75 on the 5-point rating scale, and the mean item ratings did not significantly differ at posttest versus follow-up. Using the one-sample t-test, the mean item ratings were each compared to the scale’s middle point, which was 3 on the 5-point scale. The mean response at follow-up to Item 3 “Do you think you will use things you heard about at the training when you are at home?” was especially high.

Parent Survey Responses

The individual responses of each of the five parents on each of the seven Parent Survey items at pretest and follow-up are shown as bar graphs in Figures 6-7. The means and standard deviations for each item at pretest and follow-up are presented in Table 4. Repeated-measures analysis of variance revealed a significant change on two of the items. The parents’ mean response on Item 2 “Your children interact in a negative way” significantly increased from pretest ($M = 2.60$) to follow-up ($M = 3.40$), $F(1,4) = 16.00$, $p < .05$, $\eta^2 = .80$. The parents’ mean response on Item 3 “You give equal attention to both of your children” also significantly increased from pretest ($M = 2.80$) to follow-up ($M = 3.8$), $F(1,4) = 10.00$, $p < .05$, $\eta^2 = .71$. 
Figure 5. Responses of each of the four siblings on the Workshop Evaluation Items 1-3 and Total Score at posttest and follow-up.
Table 3

Sibling Evaluation Measure Group Means, with Standard Deviations in Parentheses.

<table>
<thead>
<tr>
<th>Item</th>
<th>Posttest (n=4)</th>
<th>Follow-up (n=4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Enjoyed training</td>
<td>4.50 (1.00)</td>
<td>3.25 (1.71)</td>
</tr>
<tr>
<td>2. Learned at training</td>
<td>3.50 (1.29)</td>
<td>3.25 (1.50)</td>
</tr>
<tr>
<td>3. Will use what learned at home</td>
<td>4.00 (1.16)</td>
<td>4.75 (0.50)</td>
</tr>
<tr>
<td>Total Evaluation Score</td>
<td>12.25 (3.16)</td>
<td>11.25 (3.50)</td>
</tr>
</tbody>
</table>
Figure 6. Responses of each of the five parents on the Parent Survey Items 1-6 at pretest and follow-up.

* Significantly higher at follow-up than pretest, at p < .05.
Figure 7. Responses of each of the five parents on the Parent Survey Item 7 and Total Score at pretest and follow-up.
Table 4

Parent Survey Measure Group Means, with Standard Deviations in Parentheses.

<table>
<thead>
<tr>
<th>Item</th>
<th>Pretest (n=5)</th>
<th>Follow-up (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Children interact positively</td>
<td>3.80 (0.45)</td>
<td>3.80 (0.84)</td>
</tr>
<tr>
<td>2. Children interact negatively</td>
<td>2.60 (0.55)</td>
<td>3.40 * (0.55)</td>
</tr>
<tr>
<td>3. Give children equal attention</td>
<td>2.80 (0.84)</td>
<td>3.80 * (0.45)</td>
</tr>
<tr>
<td>4. Children often play together</td>
<td>3.00 (0.71)</td>
<td>3.40 (0.55)</td>
</tr>
<tr>
<td>5. Sibling initiates play</td>
<td>3.60 (1.14)</td>
<td>3.60 (0.89)</td>
</tr>
<tr>
<td>6. Sibling praises or rewards client</td>
<td>4.00 (0.71)</td>
<td>4.00 (0.71)</td>
</tr>
<tr>
<td>7. Sibling ignores problem behavior</td>
<td>3.20 (1.30)</td>
<td>2.80 (0.84)</td>
</tr>
<tr>
<td>Total Parent Survey Score</td>
<td>23.80 (3.42)</td>
<td>24.00 (2.45)</td>
</tr>
</tbody>
</table>

* Statistically significant increase, at p < .05
Total Parent Survey scores for each parent were also calculated by summing the parents’ item scores, after reverse-coding Item 2 responses. (Six of the items were positively worded, while Item 2 was negatively worded. The internal consistency or inter-item reliability, as measured by Cronbach’s alpha on the standardized items, was higher with Item 2 reverse-coded ($r_\alpha = .732$) than with Item 2 originally-coded ($r_\alpha = .358$). Thus, the Total Parent Survey score, calculated after reverse-coding Item 2, was included as a measure of overall parent evaluation.)

The Total Parent Survey scores for each parent at pretest and follow-up are presented in Figure 7. Repeated-measures analysis of variance showed that there was no significant change in the mean Total Parent Survey score from pretest ($M = 23.80$) to follow-up ($M = 24.00$).

The parents also answered four open-ended questions. Their written responses to these questions at pretest and follow-up are presented in Appendix N.

*Client Target Behaviors*

The target behaviors for the three client children were Verbal Outburst, Escape, Noncompliance, and Aggression. The operational definitions for each of these behaviors are presented in Appendix M. Multiple-baseline graphs for the rates per hour of each of these target behaviors and for total target behaviors over successive days are presented in Figures 8-12. (The horizontal axis includes each day in which at least one client had therapy. If a client did not have therapy on a particular day, no data point is shown for
Figure 8. The rate of verbal outburst behavior per session hour over successive days for Clients 1, 2, and 3 at baseline and after intervention.
Figure 9. The rate of escape behavior per session hour over successive days for Clients 1, 2, and 3 at baseline and after intervention.
Figure 10. The rate of Non-Compliant behavior per session hour over successive days for Clients 1, 2, and 3 at baseline and after intervention.
Figure 11. The rate of aggressive behavior per session hour over successive days for Clients 1, 2, and 3 at baseline and after intervention.
Figure 12. The overall behavior rate per session hour over successive days for Clients 1, 2, and 3 at baseline and after intervention.
that child on that day. In order to clearly show the sequence of each child’s data points, straight lines connect the child’s successive data points within each phase.)

Means and standard deviations for the rates of each target behavior in baseline and after intervention for each of the client children are presented in Tables 5-7. Analysis of variance, with Welch’s adjustment for data with heterogeneous variances and unequal sample sizes, was used to compare each client’s behavior scores before versus after the intervention. Client 1 showed no significant differences in rates of target behaviors before versus after intervention. Client 2 showed significantly lower rates of Verbal Outbursts after intervention \((M = 0.55)\) than in baseline \((M = 1.80)\), \(F_w (1, 23.05) = 6.77, p < .05, \eta^2 = .23\). Client 2 also showed significantly lower rates of Escape behaviors after intervention \((M = 0.00)\) than in baseline \((M = 1.40)\), \(F_w (1, 18.00) = 5.07, p < .05, \eta^2 = .23\), with zero instances of escape behaviors observed after the intervention. Client 3 showed significantly lower rates of Verbal Outbursts after intervention \((M = 0.08)\) than in baseline \((M = 1.62)\), \(F_w (1, 44.68) = 7.11, p < .05, \eta^2 = .14\). Client 3 also showed significantly lower rates of Escape behaviors after intervention \((M = 0.11)\) than before \((M = 0.90)\), \(F_w (1, 28.75) = 17.70, p < .001, \eta^2 = .38\). Client 3 also showed significantly reduced rates of Noncompliance after intervention \((M = 0.39)\) than before \((M = 1.78)\), \(F_w (1, 44.95) = 7.84, p < .01, \eta^2 = .15\). Client 3 additionally showed reduced rates of overall Total Target Behaviors after intervention \((M = 1.33)\) than before \((M = 5.83)\), \(F_w (1, 47.11) = 12.00, p < .001, \eta^2 = .20\).
Table 5
Mean Rates of Target Behaviors for Client 1 in Baseline and after Intervention, with Standard Deviations in Parentheses.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Baseline (n=32)</th>
<th>After Intervention (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Outburst</td>
<td>0.38 (0.58)</td>
<td>0.23 (0.47)</td>
</tr>
<tr>
<td>Escape</td>
<td>0.08 (0.22)</td>
<td>0.09 (0.30)</td>
</tr>
<tr>
<td>Non-Compliance</td>
<td>0.09 (0.27)</td>
<td>0.42 (0.83)</td>
</tr>
<tr>
<td>Aggression</td>
<td>0.00 (0.00)</td>
<td>0.14 (0.32)</td>
</tr>
<tr>
<td>Overall</td>
<td>0.55 (0.80)</td>
<td>0.86 (1.60)</td>
</tr>
</tbody>
</table>
Table 6
Mean Rates of Target Behaviors for Client 2 in Baseline and after Intervention, with Standard Deviations in Parentheses.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Baseline (n=19)</th>
<th>After Intervention (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Outburst</td>
<td>1.90 (1.61)</td>
<td>0.49 * (0.87)</td>
</tr>
<tr>
<td>Escape</td>
<td>0.15 (0.28)</td>
<td>0.00 * (0.00)</td>
</tr>
<tr>
<td>Non-Compliance</td>
<td>1.06 (0.83)</td>
<td>0.78 (0.81)</td>
</tr>
<tr>
<td>Aggression</td>
<td>0.14 (0.28)</td>
<td>0.00 (0.00)</td>
</tr>
<tr>
<td>Overall</td>
<td>3.25 (2.41)</td>
<td>1.27 (1.64)</td>
</tr>
</tbody>
</table>

* Significant decrease, at p < .05
Table 7

Mean Rates of Target Behaviors for Client 3 in Baseline and after Intervention, with Standard Deviations in Parentheses.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Baseline (n=44)</th>
<th>After Intervention (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Outburst</td>
<td>1.47 (3.78)</td>
<td>0.08 * (0.20)</td>
</tr>
<tr>
<td>Escape</td>
<td>0.99 (1.00)</td>
<td>0.11 *** (0.27)</td>
</tr>
<tr>
<td>Non-Compliance</td>
<td>1.81 (2.98)</td>
<td>0.39 ** (0.52)</td>
</tr>
<tr>
<td>Aggression</td>
<td>1.64 (2.38)</td>
<td>0.83 (1.29)</td>
</tr>
<tr>
<td>Overall</td>
<td>5.92 (7.95)</td>
<td>1.33 *** (1.21)</td>
</tr>
</tbody>
</table>

* Significant decrease, at p < .05
** Significant decrease, at p < .01
*** Significant decrease, at p < .001
DISCUSSION

The purpose of this study was to investigate and evaluate the effectiveness of sibling training for increasing the positive attitudes and interaction skills of the siblings, decreasing the sibling’s perceived social distance with members of their family, and decreasing maladaptive behavior of the children diagnosed with autism. Within this study, parent participants were also used to evaluate possible changes in the sibling and client relationship, as well as the equality in attention given to both the sibling and the client.

The sibling participants showed some nonsignificant increases in item responses on the sibling survey, showing a trend towards more positive attitudes from pretest to posttest. The sibling participants also showed nonsignificant decreases in perceived social distance as measured by the social distance scale when compared at pretest to follow-up. The parent participants showed a significant increase in the equality of attention they give to both the sibling and the client from pretest to follow-up. One client showed a significant increase in one target behavior when compared at baseline and after intervention, while the other two client participants showed significant decreases on several target maladaptive behaviors from baseline to after intervention. On the sibling evaluation forms, the siblings gave especially high responses at follow-up to the question of whether they will use what they learned at the training when they are at home, and
their mean response to this question was significantly higher than the middle point of the scale.

Conclusions about Hypotheses

The researcher’s first hypothesis was that the attitudes of the siblings toward children with autism, as measured by the sibling survey, would be more positive at posttest and follow-up after sibling training, relative to pretest before training. Although there were no statistically significant changes in item response scores, the researcher did notice that many changes were in the predicted direction.

The second hypothesis was that the training would affect the behavior of the sibling toward the client in a positive way at posttest and follow-up compared to the pretest, as noted by the sibling and parent surveys. Again there were no significant differences in the scores on the sibling or parent surveys in terms of more positive interactions between the sibling and the client, but many item response scores were in the predicted direction. One item response score that was in the opposite of the predicted direction related to the negative interactions observed between the sibling and the client. The parents reported a significant increase in negative interactions between their children at follow-up when compared to pretest. The parent survey did show a statistically significant increase in item response scores when investigating the parent’s behavior toward the sibling and the client participants. The parents reported giving the sibling and client participant more equal attention at follow-up compared to pretest.
The third research hypothesis was that the siblings’ perceived distance between family members, as measured by the Social Distance Scale would decrease at posttest and follow-up compared to pretest. The researcher observed small changes in perceived social distance for all sibling participants, with a slight but nonsignificant decrease in total score at posttest and follow-up again when compared to total pretest scores.

The fourth research hypothesis was that the maladaptive behavior of the client would decrease after the training, compared to baseline before the training. Client 1 showed a nonsignificant increase in target behavior after intervention when compared to baseline, which is in the opposite direction of the researcher’s predictions. Towards the end of the after-intervention phase, the client went through some major changes with his school schedule, school staff, and levels of demands placed on him while at school. These changes may have contributed to the client’s brief spike in target behavior during the after intervention phase of the research. Client 2 showed a significant decrease in both verbal outburst behavior and escape behavior after intervention when compared to baseline rates of behavior. Client 2 also showed decreases of other target behaviors after intervention that were in the predicted direction but were not significant. Client 3 showed significant decreases in verbal outbursts, escape, non-compliance, and overall rate of behavior after intervention when compared to baseline rates.

These decreases in client maladaptive behaviors are consistent with the results of Shreibman, O’Neill, and Koegel (1983) that after sibling training there was a marked improvement in the behavior displayed by the child diagnosed with autism. However,
Shreibman, O’Neill, and Koegel reported an increase in positive social interactions between the sibling and client, while the current study only found trends in that direction.

Outcomes for Each Family

Both girls in the first training spoke about their experiences growing up with a younger brother with autism and how that has affected their lives as well as the lives of their entire family. Both participants asked a variety of questions regarding how they can use the tools presented in the training to address specific behaviors or situations that they face at home with their brothers. In the role-play scenarios these situations and concerns were addressed and each participant had a chance to practice how they may be able to use the techniques discussed to assist them in interacting more effectively with their sibling.

The second training differed from the first training in regards to the information that was discussed due to the fact that both participants were talking about the same client participant. The researchers attempted to allow each participant to express their individual relationship and concerns in regards to their brother, but at times this became difficult due to the other sibling disagreeing or stating to the researchers that certain concerns were invalid. Once again specific questions, concerns, and difficult situations that were brought up by the siblings were practiced in the role-play scenarios.

There were many extraneous variables that relate to the individual dynamics of each participant. Each participant and their family as a unit bring aspects of their daily lives into the research, and this can be both a positive contribution as well as a possible limitation to the research conducted.
One extra outcome from the research was a peer relationship that has continued outside of the research. Siblings 1 and 2 from the first training have continued a relationship outside of the formal research setting, and their families have encouraged this relationship. It has been reported that the families are planning on getting together again in the future with the siblings as the focus instead of the clients. This is a potential benefit for all of the members of the families involved.

The family of Client 1 and Sibling 1 have also experienced some difficulties that were extraneous to the research. After the training was conducted, problems with the client’s education placement and school staffing presented itself, placing an additional stress on each member of the family. This could account for the spike in aggression in Client 1 as well as some of the self-report responses on the follow-up surveys.

It was also reported to the researcher by Sibling 2 that after the conclusion of the formal research she and her brother had been spending more time together and that he was greeting her independently when she arrived home from school. Sibling 2 also reported engaging in a wider variety of activities with her brother and spending more time with him in general.

The family that participated in the second training reported that the older of the two siblings, Sibling 4 takes on a larger caregiver role in her relationship with the client than does Sibling 3. This difference in relationship dynamics between the siblings and the client may have accounted for some of the responses given by each of the siblings in the second training due to the fact that they are members of the same family.
On the open-ended questions, the parents of Sibling 1 wrote longer answers at follow-up compared to pretest. These answers included a balance of positive and negative interactions and activities between the sibling and client at both pretest and follow-up. The answers of the parent of Sibling 2 were very similar at pretest and follow-up, and the same was true for the mother’s answers for Siblings 3 and 4.

The significant increase in the parents’ responses on Item 2 indicating an increase in the children’s negative interactions could have occurred because the siblings may have been trying out new ways of interacting for the first time with the client, which may have disrupted the usual family interactions. The significant increase in parents’ responses on Item 3 indicates that they are giving more equal attention to both the sibling and the client. This change could have occurred because participating in the sibling study may have brought about greater parental awareness of the sibling.

Limitations of the Study

One limitation of this study involved the measures used to assess the changes in attitudes on the part of sibling, and the changes in the interaction between the sibling and the child, as measured by the sibling survey and the parent survey. The responses given on the self-report measures may not be accurate due to natural limitations in awareness and memory. They may also biased due to reactivity from the presence of the research assistants when the siblings were completing the pretest and posttest survey, as well as possible parent presence when completing the follow-up survey. Due to the fact that the researcher was not present when the participants filled out the follow-up surveys, it is
unknown if the siblings were in an environment in which they felt free to answer the questions honestly. The parent participants were also in the presence of the primary researcher when completing their pretest survey, which may have led to the questions not being answered completely honestly. The answers given on the follow-up surveys may have also been affected by other stressors in the lives of the participants, which the researcher would not be aware of.

Another limitation is the lack of interobserver reliability checks for the clients’ behavioral data. To obtain this, a second, independent observer would have had to attend at least 20% of the client’s in-home therapy sessions and tally occurrences of the client’s target behaviors. The client baseline behavior records were archival, since the researcher did not know in advance which families would participate. Sending a second observer into the home therapy sessions after the training would have introduced a new confounding variable in the clients’ environment. Future research could include these checks on interobserver reliability.

The pattern of behavior at baseline was also another limitation to this study. Because of time constraints in scheduling the sibling workshops when the family participants could attend, the researcher was not able to wait until all target behaviors of the clients were stable at baseline prior to conducting the intervention. This variability in some of the behavior data limited the conclusions that could be made regarding the changes in behavior after the intervention had taken place. It would be beneficial in future research to wait to introduce the intervention until all of the clients’ target behaviors were stable.
Another limitation to this study was the limited time after intervention during which behavior data were collected for the client participants. It is unknown what behavior changes would have been seen if data were collected for an extended period of time after the sibling trainings were conducted. Having the opportunity to collect behavior data for a longer period of time, the researcher may have seen long term behavior changes.

The small number of participants and sibling trainings were another limitation to this study. Due to scheduling conflicts and other personal issues, some families were not able to participate. The number of participants was also limited by the fact that only families receiving services from the Redwood Coast PCFA office were eligible to participate. Having a larger number of participants would add to the generality of the research findings. It would be beneficial to include participants from a diversity of geographic, ethnic, and socioeconomic backgrounds to increase generality of the findings.

It would also be ideal to have both of the participants in each training be from different families. This gives each sibling the opportunity to talk about their personal experience, as well as meet a peer that perhaps is in a similar situation to them. In the second training both of the siblings were from the same family, and this may have limited them from talking honestly about their individual experiences. More participants would also provide larger degrees of freedom and greater power for statistical tests that would be conducted to identify significant changes.
A further limitation of this study was the limited number of trainings conducted with each sibling participant. Having multiple trainings or a follow-up training may have given the siblings an opportunity to go home and practice using the techniques presented and then be able to come back to the researcher with specific questions, concerns, and requests for clarification in how to use the information presented in the previous training. This would have also given the siblings more of an opportunity to feel increasingly comfortable with the researcher and research assistants, and in turn perhaps they would have felt more comfortable to talk about issues that they might not have wanted to divulge during the first training.

**Implications**

The findings of this research lend support to the value of training programs that include information about autism and the techniques used in applied behavior analysis interventions for siblings of children who are diagnosed with autism as a tool in increasing positive attitudes toward the child diagnosed with autism and decreasing the maladaptive behavior of that child. Future research may provide more information on the long term effects of such training programs, as well as the most pertinent information to present to the siblings.

This research also implies that providing this training may affect all members of the family including the parents by increasing the parents’ awareness of the equality of attention they give to both the sibling and the client. This training may provide the entire family with tools in which to make each relationship in the family more positive and
increase the awareness on the ways having a child with autism affects every member of the family.

This research also adds to the body of research conducted on sibling training and the direct effects that having a brother or sister with autism has on the sibling. This research also adds to the body of research conducted on parent or caregiver training. Future research may incorporate every member of a family in a training program, as well as pinpointing particular techniques used in applied behavior analysis to train parents in an attempt to support their child diagnosed with autism. Furthermore this research adds to the body of research on ways to decrease maladaptive behavior in children with autism. Future research may investigate the long term effects on behavior and in the validity of the findings of the current research.

Future Research

Future research may continue to investigate the effectiveness of providing training based in applied behavior analytic principles to siblings of children diagnosed with autism on attitudes of the siblings toward the client, and on the behavior of the child diagnosed with autism. Future research could look at the effectiveness of this training using a larger sample size and a sample with more variation in ages and genders among the siblings and the clients.

Future research could also look at the potential benefits of increasing the amount of training given to each sibling, including investigating the long term outcomes of providing a one week training versus a 3 month training versus a 6 month training, as
well as the information provided, as well as techniques practiced in the training. In addition future research could incorporate one-to-one training of the siblings in their home environment while they are interacting with the child diagnosed with autism, providing very applicable training that could also increase the generalizability of skills and information provided.

In the future it could also be beneficial to research the effectiveness of a family training. Training could be provided to all members of a family unit, both in a formal training environment as well as in the natural setting, and changes in relationships between each member of the family as well as the potential changes in the client’s behavior and skill acquisition could be investigated.

Future research could focus on the sibling in a variety of ways, examining ways to better support this member of the family, as well as utilizing them as an important peer figure for the child diagnosed with autism. Peer groups for the siblings is another avenue research could take on in the future, looking at the effects that a peer group of other siblings has on the attitudes and types of interactions the sibling has with the client.

This study adds to the small pool of research exploring ways to support siblings of children diagnosed with autism, and offers a way to continue to research and develop these much needed services.
REFERENCES


http://www.cdc.gov/ncbddd/autism/faq_prevalence.htm


APPENDIX A

Informed Consent for Parents

EFFECTS OF SIBLING TRAINING ON IN-HOME APPLIED BEHAVIOR ANALYSIS PROGRAMS AND ATTITUDES TOWARD CHILDREN WITH AUTISM

Investigator

Kristen N. Kelley, Principal Investigator
Graduate Student in Psychology, Humboldt State University
Behavior Therapist, Pacific Child and Family Associates
(707)442-4900
knk9@humboldt.edu

What is the reason for this study?

Before you agree to participate in this study and allow the participation of your children, we want you to know the purpose and goals of the study. We would also like you to know exactly what will happen to you and your two children if they participate. Your participation as well as the participation of your children in this study is completely voluntary. Please feel free to ask questions about anything you do not understand or would like more information about. Having your children in this study is entirely voluntary.

The purpose of this study is to investigate the effectiveness of a training program designed for siblings of children with autism. The training program will attempt to educate siblings about autism and teach them some tools they may be able to use when interacting with their autistic brother or sister. In addition this training will attempt to improve the attitudes of the siblings toward children with autism.

What will happen?

First, your son or daughter will come to the Humboldt State University Psychology Clinic to fill out a survey and attend the Sibling Training for your child as well as one other child conducted by Kristen N. Kelley and two other assistants. You will also be asked to fill out a survey when you bring your son or daughter to the training. One week after the training you and your son or daughter will be asked to fill out another survey sent to you by mail. Additionally, the behavior program data of your child who is a client of PCFA will be collected, monitored, and measured during the duration of the study.
How long will this take?

The surveys should take about 10-15 minutes to complete each time and the training your son or daughter participates in will last 5 hours on a single day, from 9:00am to 2:00pm.

Will anything bad happen to me or my children?

We do not think anything bad will happen to you or your children. You have the right to stop filling out any of the surveys as well as withdraw you and your children from the study at any time. You may communicate any concerns that you have with Kristen N. Kelley at (707) 442-4900 or knk9@humboldt.edu or with my faculty advisor Mary Gruber, Ph.D., BCBA, at (707) 826-3748 or mbg2@humboldt.edu.

What will my children and I gain?

You and your children are not guaranteed to gain anything from this study. It is the hope of the researchers that your child will learn effective tools to use when interacting with his or her autistic brother or sister, as well as improving their attitudes towards children with autism. In addition it is the hopes of the researchers that the undesirable behaviors of your autistic child will decrease, but again this is not a guarantee. This study will also provide information that can later be used in the development of future sibling trainings.

What is the cost and compensation for the training?

There is no fee for the training or your participation in this study. In addition, no compensation for participating in this study will be given. You are asked to provide a lunch for your child to eat while at the training.

Is this study confidential?

All of the data and records obtained in this study will be kept confidential. No names or identifying information will be used when reporting the results of the study. The records of this study will be kept confidential. All notes, surveys, forms, and data will be number coded so that no real names will be used in the final reporting of this study or on any of the data collected by the researcher. All number coded notes, surveys, forms and data will be kept with the primary researcher in a locked file cabinet for five years as stipulated by University regulations, and will then be shredded. All behavior data will be kept at the Pacific Child and Family Associates office.

What are the risks?
As with all research there may be some unforeseen risks to the participants involved. Potential risks may include temporary stress or disruption in daily routine or activities for you and your children, but these are expected to be minor. For your convenience, this study is limited to one Saturday session and completion of written forms.

Can my children and/or I quit at anytime?

Your participation and the participation of your children is completely voluntary. Both you and your children have the right to stop participation at any time. Having your children in this study is entirely voluntary.

Who do I call if I have questions?

Please contact Kristen N. Kelley at (707) 442-4900 or knk9@humboldt.edu if you have questions. You may also contact my supervisor Deb Ewen, M.A., BCBA, PCFA Eureka Clinic Director at (707) 442-4900 ext. 224. Additionally you may contact my advisor Mary Gruber, Ph.D., BCBA, Professor of Psychology at (707) 826-3748.

The research will be conducted by Kristen N. Kelley in partial fulfillment for the degree Masters of Arts in psychology, and will be under the supervision of Mary Gruber, Ph.D., BCBA, Professor of Psychology.

Participation or nonparticipation in this study will in no way affect your PCFA services.

Signatures:

My signature indicates that I agree to participate in this study through filling out written surveys.

__________________________________________  ______________
Signature of Participant                        Date

My signature indicates that I give permission for my child to participate in this study through filling out written surveys and attending one training session.

__________________________________________  ______________
Signature of Parent                             Date

Name of sibling
My signature indicates that I give permission for my child to participate in this study through their behavior data being collected and analyzed throughout the course of this study.

___________________________________           _________________________
Signature of Parent                          Date

_________________________________________
Name of PCFA client

__________________________________________
Kristen N. Kelley                           Date
Graduate Student in Psychology
APPENDIX B
Informed Assent for Child Participant

Name of the study: EFFECTS OF SIBLING TRAINING ON IN-HOME APPLIED BEHAVIOR ANALYSIS PROGRAMS AND ATTITUDES TOWARD CHILDREN WITH AUTISM

Kristen N. Kelley would like you to come to a meeting for five hours on one day to talk about your brother/sister and how to play with them. She will tell you and another child about autism and teach you about things you can do with your brother/sister. She also wants to ask you some questions that you will answer on a worksheet.

If you want to come and talk to her and have her ask you questions, please check “Yes” and write your name on the bottom of this paper.

If you do not want to come and talk and answer questions, then please check “No” on the bottom of this paper. It is okay if you want to say “no” and no one will make you be in this study. So please check “no” if you do not want Kristen N. Kelley to talk to you about your brother/sister and ask you questions.

You may ask Kristen any questions you want at any time and she will answer them for you.

Please put a check by one of the answers below.

___ Yes, I want to do this

___ No, I do not want to do this

Your name:

_____________________________________________________________________

If you have any questions you can call or email Kristen N. Kelley at (707) 442-4900 or knk9@humboldt.edu
FOR RESEARCHER USE ONLY:

Parent name ____________________________   Permission received? ____________

_______________________________________________________          ___________
Signature of research team member confirming permission/assent          Date
APPENDIX C

Sibling Training Topics

9:00 am-9:30 am: Check in, Welcome, Introductions

9:30 am-9:45 am: Pretest Survey

9:45 am-10:00 am: Favorites Game

10:00 am-10:45 am: What is Autism and how may it manifest itself?
  - Basic information
  - Behaviors
  - Learning processes

10:45 am-11:00 am: Break

11:00 am-12:00 pm: What is Behavior Therapy?
  - Why we are there
  - Reinforcement
  - Extinction
  - How you can use it
  - Role play including mock trials and siblings acting out reinforcement and extinction procedures

12:00 pm-12:30 pm: Break

12:30 pm-1:00 pm: Play Skills

1:00 pm-1:30 pm: Questions, Personal experiences, Comments

1:30 pm-2:00 pm: Closing and Posttest Survey
Dear Parents,

My name is Kristen Kelley and I am a Behavior Therapist with Pacific Child and Family Associates. In addition to working with PCFA, I am currently pursuing my Masters Degree in Psychology at Humboldt State University. I am currently beginning work on my thesis research and am looking for interested families to participate. My research focuses on the training of siblings of children diagnosed with autism. Within this training we will be going over basic information about autism, reinforcement and extinction procedures, ways to play and interact, as well as what behavior therapy is and how it can be beneficial. I believe that participation in the study can be beneficial for the entire family. At this time no dates have been set for the training, but I am looking for interested families so I can begin the planning process. Please do not feel as though you are committing now as you will have the opportunity to withdraw from the research at any point of the process. The training will not require a large amount of time from you or your children, approximately 5 hours of time in total. All data collected in this research will be kept confidential and no names will be used when reporting the results of this study. Participation or nonparticipation in this study will in no way affect services provided by PCFA. If you are interested in having your children involved, please send back the post card included with this letter or call the PCFA office at (707) 442-4900 ext. 221, leave a message in the general mailbox, and I will get back to you promptly. Not all interested parties are guaranteed a place in the research, but additional trainings may be provided for all parties who are interested at a later time.

Thank you so much for your time and consideration.

Sincerely,

Kristen Kelley
Graduate Student in Psychology
Humboldt State University
EFFECTS OF SIBLING TRAINING ON IN-HOME APPLIED BEHAVIOR ANALYSIS PROGRAMS AND ATTITUDES TOWARD CHILDREN WITH AUTISM

Name: ________________________

Please check one of the following

☐ Yes, I would like to participate in this study.
   If you checked Yes, please include the name of the child to be enrolled in the training: ________________________

☐ I might want to participate in this study, please contact me with more information.

☐ No, I do not wish to participate in this study.

Thank you so much for your time and consideration. If you have any questions, comments, or concerns please feel free to contact me.

Kristen N. Kelley
Graduate Student in Psychology, Humboldt State University
Behavior Therapist, Pacific Child and Family Associates

(707) 442-4900
knk9@humboldt.edu
APPENDIX E

Sibling Survey

by
Kristen N. Kelley

1. Do you like playing with your brother/sister?

1  2  3  4  5
Not at all  Slightly  Sometimes  Often  Always

2. How often do you play with your brother/sister?

1  2  3  4  5
Never  Rarely  Sometimes  Often  Everyday

3. Do you know how to play with your brother/sister?

1  2  3  4  5
Not at all  Slightly  Sometimes  Often  Always

4. How often do you initiate play activities with your brother/sister?

1  2  3  4  5
Never  Rarely  Sometimes  Often  Everyday

5. How often do you praise or reward your brother/sister?

1  2  3  4  5
Never  Rarely  Sometimes  Often  Everyday

6. How often do you ignore your brother/sister when they do something you do not like?

1  2  3  4  5
Never  Rarely  Sometimes  Often  Everyday

7. Do you like when a behavior therapist comes to your house?

1  2  3  4  5
Not at all  Slightly  Sometimes  Often  Always
8. Do you feel like you take care of your brother/sister?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>Slightly</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
</tbody>
</table>

9. Do you get attention from your parents?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>Slightly</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
</tbody>
</table>

10. Does your brother/sister get attention from your parents?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>Slightly</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
</tbody>
</table>
APPENDIX F

Parent Survey

by
Kristen N. Kelley

Please circle the number that best describes the way you feel

1. Your children interact in a positive way…
   
   1                  2                 3             4             5
   Not at all     Rarely    Sometimes   Often    Always

2. Your children interact in a negative way…
   
   1                  2                 3             4             5
   Not at all     Rarely    Sometimes   Often    Always

3. You give equal attention to both of your children…
   
   1                  2                 3             4             5
   Not at all     Slightly    Sometimes   Often    Always

4. How often do your children play together?
   
   1                 2                 3              4             5
   Never         Rarely     Sometimes    Often   Everyday

5. How often does your child (the child enrolled in the training) initiate play activities with his or her brother/sister?
   
   1                 2                 3              4             5
   Never         Rarely     Sometimes    Often   Everyday

6. How often does your child (enrolled in training) praise or reward their brother/sister?
   
   1                 2                 3              4             5
   Never         Rarely     Sometimes    Often   Everyday

7. How often does your child (enrolled in training) ignore their brother/sister when they do something they do not like?
   
   1                 2                 3              4             5
   Never         Rarely     Sometimes    Often   Everyday
Please briefly describe how your children interact with each other.
________________________________________________________________________
________________________________________________________________________

If they play together what kinds of activities do they engage in?
________________________________________________________________________
________________________________________________________________________

What are some of the positive aspects of this relationship?
________________________________________________________________________
________________________________________________________________________

How do you wish this relationship was different?
________________________________________________________________________
________________________________________________________________________
APPENDIX G

Social Distance Scale

1. Mark the circle where you would put your brother or sister.

   ME

2. Mark the circle where you would put your mother.

   ME

3. Mark the circle where you would put your father.

   ME

4. Mark the circle where you think your brother or sister would put you.

   Brother or Sister

5. Mark the circle where your brother/sister would put their mother.

   Brother or Sister

6. Mark the circle where your brother/sister would put their father.

   Brother or Sister
APPENDIX H

Sample Behavior Data Sheet for the PCFA Client

<table>
<thead>
<tr>
<th>Date/Time/Name</th>
<th>Non-Compliance Frequency</th>
<th>Verbal Protest Frequency</th>
<th>Aggression Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Antecedent</th>
<th>Behavior</th>
<th>Consequence</th>
</tr>
</thead>
</table>
APPENDIX I

Autism Information

By
Kristen N. Kelley

What is autism?

Autism is a disability that may make a person act differently in some ways.
- Sometimes people with autism have trouble talking or letting you know how they feel.
- Sometimes they might not know how to make friends or act when they are around other people.
- Sometimes they have a hard time playing games or playing with toys the way other people do. Sometimes they don’t know how to play.
- Sometimes they might not understand how you or other people feel.

Positive Reinforcement

- When your brother or sister does something nice or that you like, tell him or her.
- You can also show them by giving them a high five or a hug if they want.
- Tell them when they do a good job. You can also say “Way to go!” “Great job!”
- This will hopefully help your sibling behave in a nice way more often.

Extinction

- When they do something that is not nice or that you do not like, try to not pay attention to it.
- You can try walking away or keep doing what you were doing.
- You can also tell an adult.
- This will hopefully help your sibling do things that are not nice less often.

Remember that the next time your brother or sister does something you like, tell him or her!
APPENDIX J

Evaluation Form

1. Did you enjoy the training? (Please circle one answer)

   1                  2                 3                4                 5
   Not at all      Slightly    Somewhat     A Lot      Very Much

2. Did you learn anything at the training?

   1                  2                 3                4                 5
   Not at all      Slightly    Somewhat     A Lot      Very Much

3. Do you think you will use things you heard about at the training when you are at home?

   1                  2                 3                4                 5
   Not at all      Slightly    Sometimes    Often      Always
APPENDIX K

PCFA Notice of Privacy Practice

Pacific Child and Family Associates, apc
410 Arden Avenue., Suite 203
Glendale, California 91203
(818) 241-6780
NOTICE OF PRIVACY PRACTICE

1. THIS NOTICE DESCRIBES HOW MEDICAL AND PSYCHOLOGICAL INFORMATION ABOUT YOU MAY BE USED AND DISCUSSED AND HOW YOU CAN GET ACCESS TO THIS INFORMATION. PLEASE REVIEW IT CAREFULLY.

II. I HAVE A LEGAL DUTY TO SAFEGUARD YOUR PROTECTED HEALTH INFORMATION (PHI)

I am legally required to protect the privacy of your psychological PHI, which includes information that can be used to identify you that I’ve created or received about your past, present, or future health or psychological condition, the provision of health care to you, or the payment of this health care. I must provide you with this Notice about my privacy practices, and such Notice must explain how, when, and why I will “use” and “disclose” your PHI. A “use” of PHI occurs when I share, examine, utilize, apply, or analyze such information within my practice; PHI is “disclosed” when it is released, transferred, has been given to, or is otherwise divulged to a third party outside of my practice. With some exceptions, I may not use or disclose any more of your PHI than is necessary to accomplish the purpose for which the use or disclosure is made. And, I am legally required to follow the privacy practices described in this Notice.

III. HOW I MAY USE AND DISCLOSE YOUR PHI.

I will use and disclose your PHI for many different reasons. For some of these uses or disclosures, I will need your prior authorization; for others, however, I do not. Listed below are the different categories of my uses and disclosures along with some examples of each category.

A. Certain uses and Disclosures Relating to Treatment, Payment, or Health Care Operations Do Not Require Your Prior Written Consent. I can use and disclose your PHI without your consent for the following reasons:

1. For Treatment. I can disclose your PHI to physicians, psychiatrists, psychologists, any other licensed health care providers who provide you with health care services or are
NOTICE OF PRIVACY PRACTICE

involved in your care. For example, if you’re being treated by a psychiatrist, I can disclose your PHI to your psychiatrist in order to coordinate your care.

2. To obtain payment for treatment. I can use and disclose your PHI to bill and collect payment for the treatment and services provided by me to you. For example, I might send your PHI to your insurance company or health plan to get paid for the health services that I have provided to you. I may also provide your PHI to my business associates, such as billing companies, claims processing companies, collection agencies, and others that process my health care claims.

3. For health care operations. I can disclose your PHI to operate my practice. For example, I might use your PHI to evaluate the quality of health care services that you received or to evaluate the performance of the health care professionals who provided such services to you. I may also provide your PHI to our accountants, attorneys, consultants, and others to make sure I’m complying with applicable laws.

4. Other disclosures. I may also disclose your PHI to others without your consent in certain situations. For example, your consent isn’t required if you need emergency treatment, as long as I try to get your consent after treatment is rendered, or if I try to get your consent but you are unable to communicate with me (for example, if you are unconscious or in severe pain) and I think that you would consent to such treatment if you were able to do so.

B. Certain Uses and Disclosures Do Not Require Your Consent. I can use and disclose your PHI without your consent or authorization for me following reasons:

1. When disclosure is required by federal, state or local law; judicial or administrative proceedings; or, law enforcement. For example, I may make a disclosure to applicable officials when a law requires me to report information to government agencies and law enforcement personnel about victims of abuse or neglect; or when ordered in a judicial or administrative proceeding.

2. For public health activities. For example, I may have to report information about you to the coroner.

3. For health oversight activities. For example, I may have to provide information to assist the government when it conducts an investigation or inspection of a healthcare provider organization.

4. For research purposes. In certain circumstances, I may provide PHI in order to conduct medical research.
5. To avoid harm. In order to avoid a serious threat to the health or safety or a person or the public, I may provide PHI to law enforcement personnel or persons able to prevent or lessen such harm.

6. For specific government functions. I may disclose PHI of military personnel and veterans in certain situations. And I may disclose PHI for national security purposes, such as protecting the President of the United States or conducting intelligence operations.

7. For worker’s compensation purposes. I may provide PHI in order to comply with workers’ compensation laws.

8. Appointment reminders and health related benefits or services. I may use PHI to provide appointment reminders or give you information about treatment alternatives, or other health care services or benefits I offer.

C. Certain Uses and Disclosures Require You to Have the Opportunity to Object.

1. Disclosures to family, friends, or others. I may provide your PHI to a family member, friend, or other person who you indicate is involved in your care or the payment for your health care, unless you object in whole or in part. The opportunity to consent may be obtained retroactively in emergency situations.

D. Other Uses and Disclosures Require Your Prior Written Authorization. In any situation not described in sections III A, B, and C above, I will ask for your written authorization before using or disclosing any of your PHI. If you choose to sign an authorization to disclose your PHI, you can later revoke such authorization in writing to stop any future uses and disclosures (to the extent that I haven’t taken any action in reliance on such authorization) of your PHI by me.

IV: WHAT RIGHTS YOU HAVE REGARDING YOUR PHI
You have the following rights with respect to your PHI:

A. The Right to Request Limits on Uses and Disclosures of Your PHI. You have the right to ask that I limit how I use and disclose your PHI. I will consider your request, but I am not legally required to accept it. If I accept your request, I will put any limits in writing and abide by them except in emergency situations. You may not limit the uses and disclosures that I am legally required or allowed to make.
B. The Right to Choose How I Send PHI to You. You have the right to ask that I send information to you at an alternate address (for example, sending information to your work address rather than your home address) or by alternate means (for example, e-mail instead of regular mail). I must agree to your request as long as I can easily provide the PHI to you in the format you requested.

C. The Right to See and Get Copies of Your PHI. In most cases, you have the right to look at or get copies of your PHI that I have, but you must make the request in writing. If I don’t have your PHI but I know who does, I will tell you how to get it. I will respond to you within 30 days of receiving your written request. In certain situations, I may deny your request. If I do, I will tell you, in writing, my reasons for the denial and explain your right to have my denial reviewed.

If you request copies of your PHI, I will charge you not more than $.25 for each page. Instead of providing the PHI you requested, I may provide you with a summary or explanation of the PHI as long as you agree to that and to the cost in advance.

D. The Right to Get a List of the Disclosures I Have Made. You have the right to get a list of instances in which I have disclosed your PHI. The list will not include uses or disclosures that you have already consented to, such as those made for treatment, payment, or health care operations, directly to you, or to your family. The list also won’t include uses and disclosure made for national security purposes, to corrections or law enforcement personnel, or disclosures made before April 15, 2003.

I will respond to your request for an accounting of disclosures within 60 days of receiving you request. The list I will give you will include disclosures made in the last six years unless you request a shorter time. The list will include the date of the disclosure, to whom PHI was disclosed (including their address, if known), a description of the information disclosed, and the reason for the disclosure. I will provide the list to you at no charge, but if you make more than one request in the same year, I will charge you a reasonable cost-based fee for each additional request.

E. The Right to Correct or Update Your PHI. If you believe that there is a mistake in your PHI or that a piece of important information is missing, you have the right to request that I correct the existing information or add the missing information. You must provide the request and your reason for the request in writing. I will respond within 60 days of receiving your request to correct or update your PHI. I may deny your request in writing.
if the PHI is (i) correct and complete, (ii) not created by me, (iii) not allowed to be disclosed, or (iv) not part of my records. My written denial will state the reasons for the denial and explain your right to file a written statement of disagreement with the denial. If you don’t file one, you have the right to request that your request and my denial be attached to all future disclosures of your PHI. If I approve your request, I will make the change to your PHI, tell you that I have done it, and tell others who need to know about the change in your PHI.

F. The Right to Get This Notice by E-Mail. You have the right to get a copy of this notice by mail. Even if you have agreed to receive notice via e-mail, you also have the right to request a paper copy of it.

V. HOW TO COMPLAIN ABOUT MY PRIVACY PRACTICES. If you think that I may have violated your privacy rights, or you disagree with a decision I made about access to you PHI, you may file a complaint with the person listed in Section VI below. You also may send a written complaint to the Secretary of the Department of Health and Human Services at 200 Independence Avenue S.W., Washington, D.C. 20201. I will take no retaliatory action against you if you file a complaint about my privacy practices.

VI. PERSON TO CONTACT FOR INFORMATION ABOUT THIS NOTICE OR TO COMPLAIN ABOUT MY PRIVACY PRACTICES.
If you have any questions about this notice or any complaints about my privacy practices, or would like to know how to file a complaint with the Secretary of the Department of Health and Human Services, please contact me at: Ira Heilveil, Ph.D., 410 Arden Avenue, Suite 203, Glendale, CA 91203, (818) 241-6780.

VII. EFFECTIVE DATE OF THIS NOTICE.
This notice went into effect on April 14,2003.

I have received, reviewed, and agree to the above Notice of Privacy Practices:

Name:__________________________________________________________________

Signature:_________________________________________Date:______________
APPENDIX L

Role-Play Scenarios

By
Kristen N. Kelley

Reinforcement:

1. Sharing: Sibling asks client for item, Client shares item - Sibling gives Client praise
2. Greetings: Sibling says “Hi (name)” Client says “Hi (name) in return = Sibling gives Client praise
3. Time to leave: Sibling says to Client “Time to go…” Sibling responds by walking to car or other destination - Sibling gives Client praise
4. Knocking: Client knocks on the Siblings bedroom door, waits to enter - Sibling gives Client praise
5. Play: Client asks to play with Sibling “Can I play?” - Sibling gives Client praise

Extinction:

1. Aggression: Client kicks/hits Sibling - Sibling walks away
2. Break toy/Ruin item: Client breaks or ruins an item of the Siblings = Sibling walks away

Extinction and Reinforcement:

Yelling followed by calm words/voice:
Client is screaming or yelling - Sibling ignores behavior.
Client uses a calm voice/uses words - Sibling gives Client praise
APPENDIX M

Operational Definitions of Client Target Behaviors

Verbal Outburst: Vocal crying out, whining, yelling, or screaming.

Escape: Leaving the designated work area or person providing instruction without permission.

Non-Compliance: Refusal to follow requests to complete a task or known instructions.

Aggression: Hitting, kicking, biting, or pinching self or others.
APPENDIX N

Written Responses for Each Parent on the Parent Survey Measure

1. Please briefly describe how your children interact with each other.
2. If they play together what kinds of activities do they engage in?
3. What are some of the positive aspects of this relationship?
4. How do you wish this relationship was different?
(Responses are written verbatim, except for substituting “sibling” and “client” in place of children’s names for confidentiality.)

Mother’s Written Responses for Sibling 1:

<table>
<thead>
<tr>
<th>Item</th>
<th>Pretest</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Children’s interactions</td>
<td>Tickle games, riding bikes, watching movies.</td>
<td>Fighting, hugs at bedtime, they greet each other every morning and after school.</td>
</tr>
<tr>
<td>2. Activities engage in</td>
<td>Same as above, play is usually on client’s terms.</td>
<td>Tickle, riding bikes, taking turns on the swings, “go fish” card game.</td>
</tr>
<tr>
<td>3. Positive aspects of relationship</td>
<td>Sibling loves to hug and kiss her brother and tell him “good job” often</td>
<td>They love each other. Sibling makes scrambled eggs for client. Sibling helps client with chores. They snuggle on the couch while watching movies.</td>
</tr>
<tr>
<td>4. How wish relationship was different</td>
<td>I wish sibling could learn to ignore some of client’s behaviors, less fighting.</td>
<td>I wish client paid more attention to sibling. I wish they would play together more often. I wish sibling had less frustration and exhaustion-sometimes she just can’t take it anymore. I wish there was a class for siblings to help them deal with these everyday issues and let them see they are not alone.</td>
</tr>
</tbody>
</table>
Father’s Written Responses for Sibling 1:

<table>
<thead>
<tr>
<th>Item</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Children’s interactions</td>
<td>Sibling helps client with meals, makes sure client puts laundry away, sibling tries to play on swings with client.</td>
<td>Sibling pushes client on swing, play outside for short periods of time, sibling greets client in morning, after school, goodnight.</td>
</tr>
<tr>
<td>2. Activities engage in</td>
<td>Play catch, push on swings, ride bikes, board games where appropriate.</td>
<td>Bike rides, swings, pool or water play, balloon fights, card games.</td>
</tr>
<tr>
<td>3. Positive aspects of relationship</td>
<td>Sibling loves client and watches out for him at all times, sibling helps him around people who don’t know client.</td>
<td>Client likes to sit next sibling when they watch a movie together. Sibling likes to make client dinner and help client with chores. Sibling tries to engage in client in play activities everyday.</td>
</tr>
<tr>
<td>4. How wish relationship was different</td>
<td>I wish client would engage sibling more. I wish client would give sibling something back once in a while emotionally.</td>
<td>I wish client would engage sibling more. I wish client would give sibling more in the relationship.</td>
</tr>
</tbody>
</table>
Mother’s Written Responses for Sibling 2:

<table>
<thead>
<tr>
<th>Item</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Children’s interactions</td>
<td>They interact well when they are both happy. If they are upset it is in a negative way.</td>
<td>They interact well if they are in good moods. Client gets upset if sibling is in a bad mood.</td>
</tr>
<tr>
<td>2. Activities engage in</td>
<td>Side by side activities, sibling teaching child to do something, running, sibling reading to child.</td>
<td>Stacking, trucks, running, teaching, pretend cook</td>
</tr>
<tr>
<td>3. Positive aspects of relationship</td>
<td>Sibling is very mothering; they learn from each other, they both learn tolerance and patience.</td>
<td>Sibling is a good teacher for client. Client teaches sibling to be patient and kind.</td>
</tr>
<tr>
<td>4. How wish relationship was different</td>
<td>I wish client wasn’t so sensitive to sibling’s moods. I wish client played like a typical child so sibling would have a more typical playmate.</td>
<td>I wish client responded more positively toward sibling.</td>
</tr>
</tbody>
</table>
Mother’s Written Responses for Sibling 3:

<table>
<thead>
<tr>
<th>Item</th>
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<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Children’s interactions</td>
<td>Sibling is 18 months older, but smaller, than client. Client is random and sometimes aggressive responses panic sibling.</td>
<td>Client sometimes hurts sibling. Sibling is trying to play with client.</td>
</tr>
<tr>
<td>2. Activities engage in</td>
<td>Watching TV, video games and playing cooperatively at parks.</td>
<td>High 5, watching TV, playing at park.</td>
</tr>
<tr>
<td>3. Positive aspects of relationship</td>
<td>Sibling is proud when client does well. Sibling wants to help.</td>
<td>They clearly love each other.</td>
</tr>
<tr>
<td>4. How wish relationship was different</td>
<td>I wish sibling felt more comfortable and less afraid.</td>
<td>I wish client did not have autism.</td>
</tr>
</tbody>
</table>
Mother’s Written Responses for Sibling 4:

<table>
<thead>
<tr>
<th>Item</th>
<th>Pretest</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Children’s interactions</td>
<td>Sibling often hangs out with client and helps care for him. Sibling goofs off with client and often makes client happy.</td>
<td>Sibling enjoys playing with client.</td>
</tr>
<tr>
<td>2. Activities engage in</td>
<td>Tickling, wrestling, setting up toys.</td>
<td>Physical play, swimming, interactive games.</td>
</tr>
<tr>
<td>3. Positive aspects of relationship</td>
<td>Sibling takes pride in her close bond with client.</td>
<td>Sibling and client love each other and are generous with each other.</td>
</tr>
<tr>
<td>4. How wish relationship was different</td>
<td>I wish sibling did not feel so responsible for client.</td>
<td>No answer given.</td>
</tr>
</tbody>
</table>