

Animal-Assisted Therapy and the Severely Disabled Child: A Quantitative Study

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Despite the increasing support of utilizing animals as adjuncts to therapy, empirical research evaluating such programs is sparse. In an attempt to help fill this void, a quantitative research design was developed to assess the efficacy of an animal-assisted therapy program being conducted at a residential facility for children with multiple disabilities. Fourteen students participated in the program. Utilizing a multiple baseline design, three designated raters were assigned to evaluate the behavioral outcomes of the student participants outside of the therapeutic setting. Although analysis of the data indicated a positive effect for all participants, no generalizations could be made due to a number of confounding factors. This article reviews the research protocol utilized in the study and offers a discussion of the problematic variables inherent in this type of research.

For centuries, the importance of animals in people's lives has been recognized (Netting, Wilson & New, 1987; All & Loving, 1999). As a work assistant or simple companion, the contribution of animals to enhanced quality of human life has been documented, both formally and informally, throughout the ages. York Retreat in England, an establishment founded by the Quakers for persons with mental illness, is attributed as the first recorded therapeutic setting where animals were utilized as adjuncts to therapy (Netting, et al., 1987). But it was the work of Boris Levinson, a psychologist who discovered that he could reach a disturbed child during therapy sessions when his dog, Jingles, was present, that initiated the momentum of scientific research into the role of pets as therapeutic agents (Mallon, 1992). Based upon his publications, both the scientific and lay communities became aware of the possibilities of using animals to enhance the therapeutic outcomes of humans. The work of Levinson and others laid the groundwork for a new field of human service, pet therapy (Mallon, 1992).

Early pet therapy programs were often staffed by volunteers who brought their pets into hospitals, nursing homes and other long-term care facilities on a regular basis (Hines & Fredrickson, 1998; Netting, et al., 1987). These programs were designed to facilitate positive therapeutic outcomes or simply to improve the quality of life of patients or residents (Hines & Fredrickson, 1998; Mallon, 1992). Through informal and unstructured pet visitation, children, adults and the elderly with disabilities or chronic illness were presumed to benefit from this . . . "integrated holistic approach to the care and rehabilitation of individuals and their families . . ." (All & Loving, 1999).

Studies investigating the easily measurable physical effects of human-animal interaction have determined that pets are effective in reducing blood pressure (Katcher, 1981; Messent, 1983; Serpell, 1990; Anderson, Reid, & Jennings, 1992) and promoting survival in coronary artery illness (Friedmann, Katcher, Lynch & Thomas, 1980; Jennings, Reid, Christy, Jennings, Anderson, Dart, 1998). Hippotherapy, or therapeutic riding, has been found to promote postural improvement and balance in patients with movement disorders (Weber, Pfothner, David, Leyerer, Rimpau, Aldridge, Reissenweber, & Fachner, 1994).

When utilized as an adjunct to therapy for elderly individuals residing in hospitals and nursing homes, animals have served as an attention-getting stimulus and an object of conversation (Barba, 1995; Fick, 1992; Savishinsky, 1992; Rossbach & Wilson, 1992; Gammonley & Yates, 1991). Pet visitation has also been found to produce measurable benefits by fostering socialization, increasing responsiveness, facilitating mental alertness and enhancing an outward focus on the environment (Proulx, 1998; Bernstein, Friedmann & Malaspina, 1995; Fritz, Farver, Kass & Hart, 1995; Holcomb & Meacham, 1989; Jessen, Cardiello & Baun, 1996; Savishinsky, 1992). Although others have reported contradictory results, incidental positive effects were still noted. It was determined that the animals' presence had a positive impact on the attitude of staff, resulting in improved interaction with patients due to reduced caregiver stress (Taylor, Maser, Yee & Gonzalez, 1993; Zisselman, Rovner, Shmuelly & Ferrie, 1995).

These findings are not atypical of those found by other researchers involved in the treatment of institutionalized persons who exhibit self-isolating behaviors. Mallon (1994) investigated the effects of placing a dog in a residential facility for children diagnosed with emotional disorders. He concluded that the dog provided social, emotional and physical benefits for both the chil-

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dren and the staff. In addition, the children, who had been recipients of nurturance, began to exhibit nurturing behaviors themselves. Caring for an animal's needs is believed responsible for the emergence of these interactive and socially appropriate behaviors (Mallon, 1994; Edney, 1995; Katcher & Wilkens, 1994; Melson, 1989; Netting, et al., 1987).

Utilization of animals to produce desirable educational or cognitive goals has been less clearly measured (Hines & Fredrickson, 1998). Of particular interest are clinical studies that provide quantifiable effects of animal-assisted therapy interventions and their effect on cognitive improvement in children with developmental disabilities. Improvement in cognitive functioning in this group, although less easily measured, is a worthy research endeavor and may be objectively studied when specific goal areas are addressed. It was the purpose of this study to provide an objective format for evaluating the effectiveness of an animal-assisted therapy program on the therapeutic outcomes of children with multiple disabilities residing in a long-term care facility. In cooperation with the Hope School in Springfield, Illinois, the current project was conducted during the 1996-1997 academic year. Using a multiple baseline design, an attempt was made to quantitatively measure the therapeutic outcomes of children presented with an AAT program over a two-month period.

Method

Participants

Fourteen subjects received the AAT intervention over the two trials. The children's parents all completed the IRB-approved release forms allowing them to participate in the program. Table One describes the participants in the study. The seven student participants in Group 1 were made up of four females and three males. They ranged in age from 7 to 17. The seven student participants in Group 2 were made up of five males and two females. They ranged in age from 9 to 19. All students had multiple disabilities and were attendants of Hope School at the time of this study. The length of time that these students had been residents varied widely; students had been residents of Hope School for as long as eight years and as little as two months. The students chosen had been diagnosed with severe to moderate mental retardation along with several other diagnoses. Students were taken out of their regular schedules to participate in the animal-assisted therapy.

Instruments

To evaluate the effect of animal-assisted therapy on student functioning, Dr. Chrisann Schiro-Geist and her graduate assistants created the Measurement of Pet Intervention (MOPI). The instrument has four items evaluated on a Likert scale of one to seven. One indicates no evidence and a seven indicates strong evidence of the specified behavior. The four items were attention span, physical movement, communication and compliance. The students were assessed over time, from the beginning of the trial to the end of treatment.

The Direct Observation Form (DOF) and the Teacher's Report Form (TRF) of the Child Behavior Checklists are standardized instruments created by Thomas M. Achenbach (1991), at

the Department of Psychiatry, University of Vermont. The DOF provides direct, empirical assessment of children through observation in natural settings. The TRF is designed to obtain reports from teachers of the students' adaptive functioning and the occurrence of specified problems in a standardized format.

The Behavior Dimensions Rating Scale (BDRS) by Bullock and Wilson (1989) is also a standardized instrument. It contains 43 items in the format of bipolar behavior descriptors. The rater is asked to select a position on a seven-point continuum that best describes the behavior shown by the student in question. This measure has four sub-scales - Sub-scale 1: Aggressive/acting out, Sub-scale 2: Irresponsible/inattentive, Sub-scale 3: Socially withdrawn, Sub-scale 4: Fearful/anxious.

Description of Study

Hope School is a residential setting for children with multiple disabilities. Three trials of the animal-assisted therapy program were proposed as the optimal treatment plan in working with the maximum number of students. This author was to work with her black Labrador Retriever, Cody, in the delivery of the animal-assisted therapy to the chosen students. Seven students were chosen for each of the three proposed trials by the Hope School staff based on student file information. Each trial consisted of two 30-minute sessions every week, for the duration of eight weeks.

Three members of Hope School's certified staff developed baselines for each child prior to the therapy sessions. The students were evaluated on four variables including attention span, physical movement, communication and compliance. The raters observed the children for a three-week period before the beginning of the therapy sessions on each variable to establish the baselines. One animal (Cody) and the same handler delivered the structured therapy program over the eight sessions to each child. Behavioral outcomes were measured outside of the therapeutic setting. T-Test analysis was used to describe changes in the aforementioned variables over the eight-week period. In addition, the same statistical analysis was applied to the two administrations of the Child Behavior Checklist as scored by the objective raters.

Research information was collected from the three designated raters that worked with the students at Hope School. The raters included a speech pathologist/technology specialist, a vision/hearing disability specialist and an adaptive physical education teacher. The raters were asked to complete the Measurement of Pet Intervention (MOPI) weekly for three weeks prior to the beginning of the treatment program to establish a baseline for student functioning. Then once the treatment began, the raters were asked to continue with the MOPI form for the remaining eight weeks for the seven designated students in the program. In addition, the raters were asked to complete the Direct Observation Form (DOF) AND The Teacher's Report Form (TRF) of the Child Behavior Checklist (CBC) and The Behavior Dimensions Rating Scale (BDRS) for the first week of treatment and the last week of treatment. Only two trials were actually completed, and only the first produced a complete data set.

After the collection of the first set of data, it was determined that inter-rater reliability was quite low for the measures used.

For the MOPI, one of the three raters' evaluations was much more inflated than the other two. There was a fairly high consistency between two of the three raters, partial correlation values of .70 to .89 across the treatment period. For the Direct Observation Form and the Teacher's Report Form, there was discrepancy between the raters regarding which test questions were valid and appropriate for the students in question. Given that the inter-rater reliability was low, all observations had to be treated as independent occurrences. Based on mean comparisons, there was no effect of age or sex on the MOPI scale.

Results

On analyzing all 14 of the students who participated in the animal-assisted therapy program, the bulk of the data suggest that

there was a movement of ratings in the positive direction with the onset of treatment and the duration of treatment across most students for all raters. Rater 1 documented positive effects for 12 out of the 14 students, whereas Rater 2 documented positive effects for 9 out of the 14 students, and finally Rater 3 documented positive effects for 7 out of the 14 students.

Although the data showed a positive trend with the effect of animal-assisted therapy, due to the many confounding factors in the study, no generalizations can be made. One of the confounding factors included a subject sample that ended up being smaller than originally intended. Three trials of animal-assisted therapy and an N of 21 were initially proposed however, only two trials and an N of 14 were actually completed. Another confounding factor was the inconsistency in the ratings by the raters. Although

attempts were made to provide the raters with instruction regarding expectations and the rating process, the data clearly shows the existence of rater effects. Finally, due to the lack of data on some weeks of treatment and baseline assessment by some raters, it is difficult to address the efficacy of animal-assisted therapy through quantitative analysis from this research project.

Discussion

Despite the promising results of many animal-assisted therapy programs, full acceptance into the therapeutic mainstream has been blocked by the lack of quantitative data assessing its effectiveness. Measuring real cognitive gain in individuals with severe mental impairments is difficult. While immediate changes in positive behaviors are often apparent, they alone cannot accurately measure the impact of a treatment. To address this issue, this study was initiated to demonstrate that animal-assisted therapy research outcomes could be quantitatively measured using a multiple baseline design. Due to a number of confounding factors however, it was not possible to make generalizations regarding the efficacy of animal-assisted therapy on the behavior of children with severe cognitive impairments from the

Table 1

Description of Student

| Subject | Gender | Age | <u>Group 1</u> |
|---------|--------|-----|--|
| | | | <u>Diagnosis</u> |
| 1 | F | 15 | Severe M.R., seizures, expressive aphasia, hearing loss, ataxic cerebral palsy |
| 2 | M | 12 | Severe M.R., cerebral palsy, epilepsy, asthma |
| 3 | F | 13 | Severe M.R., microcephaly |
| 4 | M | 7 | Moderate M.R., autism |
| 5 | F | 8 | Severe/Profound M.R., seizure disorder, spastic quadriplegia, rickets, visual impairment |
| 6 | F | 7 | Moderate/Severe M.R., Apert's Syndrome, behavior disorder |
| 7 | M | 17 | Severe M.R., epilepsy, hypotonic cerebral palsy, nonverbal |
| | | | <u>Group 2</u> |
| 8 | M | 13 | Severe M.R., cerebral palsy, spastic deplegia, cortical blindness, non-ambulatory, nonverbal |
| 9 | M | 14 | Severe/Profound M.R., seizure disorder, autistic-like features, undefined etiology |
| 10 | F | 13 | Severe/Profound M.R., Down Syndrome, nystagmus, strabismus, myopia |
| 11 | M | 16 | Severe M.R., Rubenstein-Taybi Syndrome, Hyperactivity |
| 12 | F | 19 | Severe M.R., Tourette Syndrome, microcephalic seizure disorder, cerebral palsy, spastic deplegia |
| 13 | M | 9 | Severe M.R., pervasive developmental delay, autism |
| 14 | M | 18 | Severe/Profound M.R., seizure disorder, mild cerebral palsy, asthma, nonverbal |

current study. This lack of success may be attributed to three factors, each of which requires discussion.

Inter-rater Reliability

To ensure the integrity of any research venture, a consistent or reliable measurement instrument must be employed. In this study, two standardized instruments with proven reliability were employed to assess student functioning, the Direct Observation Form and the Teacher's Report Form of the Child Behavior Checklists and the Behavior Dimensions Rating Scale. The third instrument, the Measurement of Pet Intervention (MOPI), had not been subjected to tests of internal validity and reliability however, efforts were made to train the raters to maintain objectivity during observation sessions and complete the MOPI accordingly.

To establish inter-rater reliability, two or more observers of the same situation must record the same behaviors with an 85% agreement rate (Leedy, 1997). It is not uncommon however, for instruments that rely on examiner judgment, much like adaptive behavior and rating scales, to exhibit low inter-rater reliability (Cohen, Swerdlik and Phillips, 1996).

Because of the lack of sufficiently detailed scoring guidelines, there is a danger that the individual judgment of the respondent, and not the quality of the assessor's behavior, will account for a great proportion of the scoring variance.

Adequate training is believed necessary to ensure acceptable levels of inter-rater reliability. Prior to the beginning of observations designed to determine behavior baselines, all three raters received training in the completion of the instruments utilized. Still, their opinions varied.

Several possibilities may offer insight into this phenomenon. The first, and most obvious, points to rater personality and subjectivity, or bias. Clearly, any instrument that relies on human judgment is susceptible to individual interpretation. Some raters may have a tendency to rate highly (a leniency or generosity error), a tendency to rate harshly (a severity error), or a tendency to rate everyone near the midpoint of the rating scale (an error of central tendency) (Cohen, et al., 1996). More precisely, the utilization of a Likert scale on the MOPI may have further contributed to rater subjectivity.

Contextual variables can also account for differences between raters using rating scales.

“. . . different informants may have different perspectives on the subjects of evaluation based on the different contexts in which they interact with the subjects" (Cohen, et al., 1996). Although the raters attempted to observe the children in their classrooms each week, on several occasions time restraints required them to complete their observations while working directly with the children. It may be presumed that the children would behave differently in the classrooms in the presence of their peers as opposed to one-on-one contact, seated before a computer, favorite toys or gymnasium equipment. The influence of context on the behavioral assessments may account for some of the discrepancy in the raters' judgments.

A third factor with regard to the raters, addresses the amount of time and effort involved in the observations and instrument completion. Although the MOPI required a minimum of time for completion, the other two instruments were said to be time-consuming, redundant and for some students, inappropriate. Additionally, the raters were required to set aside time from full-time work schedules to complete the observations for each of the seven students each week. The time constraints imposed on them by full caseloads, coupled with participation in this research project, may have ultimately diluted their enthusiasm and impacted their willingness to devote the time and effort required to do the job properly. This factor likely accounts for the lack of complete data on the second group of students in Trial 2.

Administrative Support

Strong administrative support of the animal-assisted therapy program and research study might have helped to alleviate some of the problems encountered with the raters. Recognition of the rater's efforts, an allowance of time for thorough training sessions and an occasional inquiry with regard to the program may have provided the impetus necessary to maintain the raters' commitment. As it happened, early in October of 1996, just as the study was about to begin, there was a change in administration. Although the outgoing director fully supported the introduction of an alternative therapy program, his successor lacked the same enthusiasm. Full administrative support may be considered an essential component of a successful program and research endeavor.

Stress in the Service Animal

The third factor that marred the outcome of this study involved the omission of the third trial resulting in a subject sample of 14 rather than 21. This was a direct result of the impact of the therapy sessions on the animal. As an integral component of the therapy team, it was believed the effects of this intensive animal-assisted therapy program on the animal was warranted and should be monitored. Consideration of a service animal's health and well-being is an important ethical issue which must not be overlooked.

Just as not every animal is a suitable partner for an animal-assisted therapy program, so too, not every child is an appropriate candidate for this type of intervention. The child with allergies or those prone to seizures due to high levels of excitement must be excluded. Additionally, children who exhibit aggression toward animals must likewise be excluded for the safety of both the animal and the child. Before an animal is allowed to enter a facility, staff should be prepared to maintain distance between the animal and aggressive children. During this program staff members did not receive instruction regarding this issue, which often resulted in the animal being deluged by children, some of whom deliberately tried to injure him. These incidents were unsettling to him, causing him to react with tentativeness for periods of time thereafter.

On a more formal basis, an attempt was made to evaluate the effects of the therapy program on the participating animal, Cody. Documentation was maintained on a daily basis to assess both physiological and behavioral changes. These documents included the Cody Behavior Checklist (CBC) developed in conjunction with Dr. Joann Eurell of the University of Illinois at Urbana-

Champaign School of Veterinary Medicine and anecdotal records maintained by this investigator. The CBC required an assessment of Cody's behavior before therapy sessions began, upon completion of each therapy session and upon returning home. It required a subjective assessment of eight behavioral variables such as mood, excitement level, fearfulness, vocalism and attentiveness. Three physiological variables were also included, yawning, licking his lips and nose and sweating through his paws. Although the behavioral assessments were easily made, the physiological components proved more difficult. It is for this reason that the results of this instrument were inconclusive.

It became apparent however, upon completion of the first eight-week session that physiological changes were occurring in Cody, the most obvious including excessive panting and frequent urination. Upon examination by his veterinarian, it was determined that Cody was suffering from both ear and urinary tract infections. A course of antibiotics was administered for a three-week period. A subsequent examination revealed that although the ear infection had been successfully treated, the urinary tract infection was still present. A second round of antibiotics was prescribed with a follow-up examination the following month. During this time, the therapy sessions were suspended and Cody appeared lethargic and exhibited symptoms of depression. As the second 8-week session was scheduled to begin in February, Cody returned to the school to become acquainted with the new group of students. He was eager to get into the car in the mornings but appeared tired while at the school.

As his health was not improving, further testing was conducted. It was then determined that Cody was suffering from Cushing's Syndrome, also known as canine hyperadrenocorticism (HAC). Cushing's Syndrome is a hormonal disorder that results in chronic elevation in circulating blood cortisol (a form of cortisone) concentrations (Tilley and Smith, 1997). This cortisol toxicity is the result of excessive production of hormones by the adrenal glands and is often the result of chronic stress. Cody was placed on the oral medication, mitotane (Lysodren) and because of the chronic nature of this syndrome, will receive this medication for life.

Although there is no conclusive evidence that Cody's illness was the result of the strain placed on him by the intense therapy regiment, one must question its impact. Cushing's Syndrome in the dog may be caused by an adrenal cortex tumor growth (15% of cases), excessive or prolonged administration of cortisone drugs (< 1%) and most commonly (85% of cases) because of an abnormality of the pituitary gland (Nelson and Couto, 1992). It is widely recognized however, that chronic stress can cause destructive physical symptoms and behaviors in both humans and animals.

Coe, Lubach and Ershler (1989) determined that psychological distress (in primates) can alter the immune system with potentially long-lasting effects. During periods of stress, cortisol levels in the blood stream become elevated. This response is necessary to increase energy levels in response to the stressor. Excessive elevation of cortisol levels may overwhelm the immune system, increasing susceptibility to illness (Huebner & Thomas, 1995). The development of ear and urinary tract infections in Cody and

subsequent development of Cushing's Syndrome, may be the result of his high, chronic stress level.

Regardless of the underlying cause, Dr. Eurell believes that environmental factors as well as heredity may be responsible for the onset of Cushing's Syndrome. She stated that the enormous stress placed on Cody might have overwhelmed his immune system resulting in illness. These stress factors included, but were not limited to:

1. Fourteen therapy sessions (seven students seen for 30 minutes, two times per week) were conducted in a three-day period of time. This was too many sessions, too close together for one animal. Although an effort was made to pair Cody with the more active children during the early sessions, he clearly showed signs of exhaustion as the day progressed.
2. This investigator was both the dog handler and therapist. Consequently, as the unexpected needs of the students were being attended to, Cody was required to accompany his handler. This extra movement may have further contributed to his exhaustion.
3. Fifteen minutes was scheduled between therapy sessions to return the student to his classroom, travel back to the therapy room to restore it to its original condition and escort Cody outside to relieve himself. An administrator expressed concern with this lapse in time and requested that it be eliminated or considerably shortened. The time span was reduced to ten minutes, again placing undue strain on the animal.

The lack of consideration for the well being of the animal utilized in this program necessitated a decision to end the therapy program. Consequently, the third group of students did not receive therapy and the research study concluded.

Recommendations

As a result of the findings from this study and to provide guidance for future animal-assisted programs, the following recommendations are offered:

1. Efforts must be made to secure strong administrative support before an animal-assisted therapy program is introduced. Administrators must be made aware of the theories and techniques underlying the program and the potential problematic issues that may arise. It is only through a joint effort between all individuals that a successful outcome can be attained.
2. To quantitatively assess the effectiveness of an animal-assisted therapy program it may be best to first measure changes within the context of the program itself. As changes are noted it may then be possible to generate more specific variables to use as objectives in the measurement of change outside of the therapeutic setting.
3. As may be expected, over the course of time many individuals participating in therapy develop a relationship with the animal. This was evident as Cody traveled the hallways at the facility and the students he had been involved with attempted to approach him as he passed by. From an ethical point of view, it is not justifiable to sever

the relationship between the child and the dog when the course of therapy has ended. Provisions should be made to allow intermittent contact on a less formal basis or other animals should be brought to visit the individuals at the facility so that relationships can continue to develop.

4. The decision to utilize a living being in the course of therapy requires special consideration. Unlike many forms of therapy where special apparatus or inanimate objects are used, animal-assisted therapy demands consideration of the health and well being of the participating animal. Efforts must be made to educate all persons within the facility to ensure the safety of the animal. Reasonable time limits must also be established for human-animal interaction to minimize stress in the animal and reduce the likelihood of exhaustion.

This inquiry focused upon a therapeutic intervention designed to enhance the outcomes of children with severe cognitive and multiple disabilities. Although the literature abounds with anecdotal reports of the positive effects of animal-assisted therapy, many scientific circles require that proof of true therapeutic gain is evident only if it can be demonstrated outside of the therapeutic setting. To address this issue, this quantitative study was initiated in an effort to provide an objective format for evaluating the effects of animal-assisted therapy.

Much can be learned from this research endeavor. Adequate preparation and cooperation of all individuals at the facility may have altered the outcome of this study. Future research endeavors may benefit by addressing the issues of inter-rater reliability, strong administrative support and the necessity of utilizing more than one animal or at least providing the handler/therapist support personnel.

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