

## Guinea pigs—The “Small Great” Therapist for Autistic Children, or: Do Guinea Pigs Have Positive Effects on Autistic Child Social Behavior?

Lucia Kršková, Alžbeta Talarovičová, and Lucia Olexová

Comenius University, Slovak Republic  
krskova@fns.uniba.sk

---

### Abstract

The aim of our study was to investigate the effects of a small therapeutic animal (TA, guinea pig) on the social behavior of nine autistic children. The social contacts of the autistic children were evaluated by a descriptive method of direct observation that was performed without (in period one) and with (in period two) the presence of a TA. In period one, contacts with an unfamiliar person (UP) and acquaintances (A) were registered; in period two, contacts with the acquaintances and the TA were registered. The frequency of contacts of autistic children with their acquaintances significantly increased in the presence of the TA ( $P < 0.001$ ). The frequency of contacts with the TA was significantly higher than the frequency of contacts with the UP ( $P < 0.001$ ). The form of the autistic children's contacts with A, with the UP, and with the TA was individually dependent, and the presence of the TA changed the characteristics of contacts with A. Our results indicate that the presence of a small TA can positively influence the quantity and quality of the social behavior of autistic children and that the characteristics of social contacts were dependent on the individual.

### Keywords

autism, animal-assisted therapy, guinea pig, social behavior

### Introduction

Autism is a neurodevelopmental syndrome defined as a deficit in social reciprocity and communication, and an occurrence of repetitive behavior (American Psychiatric Association, 2000). The social problems associated with autism can be classified into three categories: social avoidance, social indifference, and social awkwardness (Edelson, 2007). The impairment of social behavior becomes apparent early in childhood and continues throughout adulthood (Edelson, 2007; Volkmar, Chawarska, & Klin, 2005). Autistic infants show less attention to social stimuli. As toddlers, they have more striking social deviance, and they have less eye contact and fewer anticipatory

postures (Volkmar & et al., 2005). According to Sigman, Dijamco, Gratier, & Rozga (2004), younger autistic children (three to five years old) are less likely to exhibit social understanding, approach others spontaneously, imitate and respond to emotions, communicate nonverbally, and take turns with others.

Older autistic children and adults have problems with face and emotion recognition (Sigman, Spence, & Wang, 2006). About a third to a half of individuals with autism do not develop enough natural speech to meet their daily communication needs (Noens, van Berckelaer-Onnes, Verpoorten, & van Duijn, 2006). They are less likely to make requests or share experiences and are more likely simply to repeat others' words (Landa, 2007; Tager-Flusberg & Caronna, 2007) or reverse pronouns (Kanner, 1943). Autistic individuals also display many forms of repetitive or restricted behavior, which the Repetitive Behavior Scale-Revised (RBS-R; Bodfish, Symons, Parker, & Lewis, 2000) categorizes as: stereotypy, compulsive behavior, sameness, ritualistic behavior, restricted behavior, and self-injurious behavior.

There is no universally accepted standard of autism treatment. Therapy is usually a combination of biochemical (e.g., medication, food, and vitamin supplements), neurosensory (e.g., auditory training and facilitated communication), psychodynamic (e.g., psychotherapy and psychoanalysis), and behavioral (e.g., TEACCH (Treatment and Education of Autistic and related Communication-handicapped Children); Wobus, 2008) methods. Another possible therapeutic method is Animal-Assisted Therapy (AAT) (Martin & Farnum, 2002).

AAT is a goal-directed intervention in which an animal that meets specific criteria is an integral part of the treatment process. AAT is practiced with human professionals. Key features include: specified goals and objectives for each individual and measured progress. AAT is designed to promote an improvement in human physical, social, emotional, and cognitive function. AAT is provided in a variety of settings and may be group-based or individually targeted in nature. AAT has been well documented and evaluated (Delta Society, 2008). AAT improves not only physical but also mental health, education, and motivation (Delta Society, 2008). Contacts with pets may have a positive influence on the development of empathy (Bryant, 1985); may facilitate language acquisition and verbal skills in children; and can positively influence cognitive development (Condoret, 1983; Salomon, 1981).

People with autism may be able to behave toward animals in ways that they cannot behave toward people (McNicholas & Collins, 1995), and AAT has been shown to increase the socialization of autistic children (Law & Scott, 1995). Dogs, horses, and dolphins are the most commonly used therapeutic animals for autism work (Autism Service Dogs of America, 2004-2008;

Hyson, 2007; Brown, 1996; Redefer & Goodman, 1989; Smith, 1984). After interactions with therapeutic dogs, children with autism exhibited more playful moods, were more focused, were more aware of their environment, demonstrated higher-level interpersonal skills, and were more social (Carenzi, Galimberti, Buttram, & Previde, 2008; Ming-Lee, 2008; Barol, 2006; Rao, 2006; Martin et al., 2002; Redefer et al., 1989). Horse therapy increased the contacts autistic children had with teachers, trainers, and family members and helped the children show social behavior (Brown, 2005; Brown, 1996). Dolphin therapy has been shown to have positive effects on emotional interactions between experimenters and autistic children (Servais, 1999). The presence of therapeutic animals can also influence other symptoms of autism, including increased development of language skills (Law & et al., 1995; Smith, 1984), decreased undesirable and increased desirable behaviors (Krishna, 2006), decreased stereotypical behaviors (e.g., hand-flapping), and decreased self-absorption (Redefar et al., 1989).

Small animals ("pocket pets") are also used in autism therapy, but information about their impact has only been anecdotal or has come from case studies. Baucum (2008) described the positive effects of guinea pig presence on cooperation and social behavior in Asperger's and ADHD children. According to Panchak (2008), rat therapy stimulated the language skills of autistic children. Stout (2001) described the positive effects of a ferret on language and social skills and a decrease of stereotypy in an autistic child. According to Law & et al. (1995), when children with pervasive developmental delay/autism work with "pocket pets" such as hamsters, rabbits, and turtles, they gained a sense of responsibility, increased their socialization, and had improvements in receptive and expressive language development.

The aim of our research was to investigate the qualitative and quantitative influences of a therapeutic animal, represented by guinea pigs (*Cavia porcellus*), on the social behavior of autistic children.

## Materials and Methods

The observation took place in the special class of a primary school oriented toward the education of children with autistic spectrum disorder, where the TEACCH program, including structured teaching, was used (Henry Spink Foundation, 2008).

The social behavior of nine autistic students (four girls and five boys, ranging in age from 6 to 13; see Table 1) was collected using a descriptive method of directed observation. Behavior was manually registered (each minute) by

one trained observer (professional ethologist) in protocols that ran from 8:30 to 12:30 AM one day per week.

**Table 1. Characteristics of the tested children (n = 9).**

Code of child*	Age	Gender	Diagnoses
A	12	female	Kanner's syndrome & intellectual disability
B	8	female	Kanner's syndrome & intellectual disability
C	7	female	Kanner's syndrome & intellectual disability
D	13	female	Kanner's syndrome & intellectual disability
E	10	male	Kanner's syndrome & intellectual disability
F	9	male	Kanner's syndrome & intellectual disability
G	10	male	Kanner's syndrome & intellectual disability
H	6	male	Asperger's syndrome
I	9	male	Kanner's syndrome & intellectual disability

\* Real names of the observed children have been concealed, and they were marked with a letter of the alphabet.

Social behavior was represented by the sum of tactile, verbal, and eye contacts. Tactile social contact was defined as the frequency of touch contacts with arbitrary parts of the body by the autistic children toward other people or the animal. Verbal contact was defined as the frequency of sounds and words that were addressed to people or the animal (a repeated phrase was counted as only one contact), and eye contact was defined as the frequency of all variants of eye contacts aimed toward other people or the animal.

The therapeutic animal was a two-year-old male guinea pig placed in a small plastic cage (12 × 20 × 16 cm) with wood shavings. The guinea pig had been previously trained to have contact with children. The training involved the guinea pig being handled by a group of three healthy children, 6 to 13 years old.

The observation was divided into two periods. In the first period, we observed the social behavior of children without the presence of an animal (10 observation days). In the second period, the social behavior of the children was observed with the therapeutic animal present (10 observation days). The therapeutic animal was placed in a plastic cage on the table in the classroom, and every child could have contact with him (they could pet him, hold him in their hands, or take him with them). The observer was sitting in the corner of the classroom (at a distance of two meters from the cage containing the guinea pig).

Before the first observation period, every child was acquainted with the observer (an unfamiliar person) during a five-minute interval. Before the sec-

ond period, every child was also acquainted with the therapeutic animal during another five-minute interval. During the first period, the observer registered the frequency and character of social contacts of the autistic children with acquaintances (teacher, schoolfellow) and with the unfamiliar person (the observer). During the second period, the observer registered the frequency and character of social contacts with acquaintances (teacher, schoolfellow) and with the therapeutic animal.

During the observation time, a total of nine students, five teachers, one observer, and one therapeutic animal (in the second period) were present in the classroom. The observer and the teachers never initiated animal-children contacts. They did, however, help with animal manipulation and responded to the requests of the children, if required.

The differences between the frequency of total and individual contacts with acquaintances during the first and second period, and differences between the frequency of total and individual contacts with an unfamiliar person and with the therapeutic animal were estimated by the nonparametric Mann-Whitney test. Individual differences in quality of social contact were measured on the basis of differences in the percentage of social behavior components: tactile, verbal, and eye contacts.

The methods and procedures of the presented study were carried out in compliance with ethical standards and were approved by the parents of the autistic children. In addition, the therapeutic animal had passed a periodic veterinary checkup.

## **Results**

Our observation revealed a significant increase in the frequency of social contacts of autistic children with acquaintances during the second observation period ( $P < 0.001$ ; Figure 1).

We found an individual difference in the frequency of social contacts of autistic children with acquaintances between the first and second period of observation. Specifically, the presence of the guinea pig during the second period significantly increased the quantity of social contacts of the B ( $P < 0.01$ ), D ( $P < 0.01$ ), F ( $P < 0.05$ ), and G ( $P < 0.01$ ) children with acquaintances (Figure 2).

Our observation revealed a preference for contact with the therapeutic animal compared to contacts with the unfamiliar person. As shown in Figure 3, the frequency of contacts with the guinea pig was significantly higher ( $P < 0.001$ ) than the frequency of contacts with the unfamiliar person (observer).

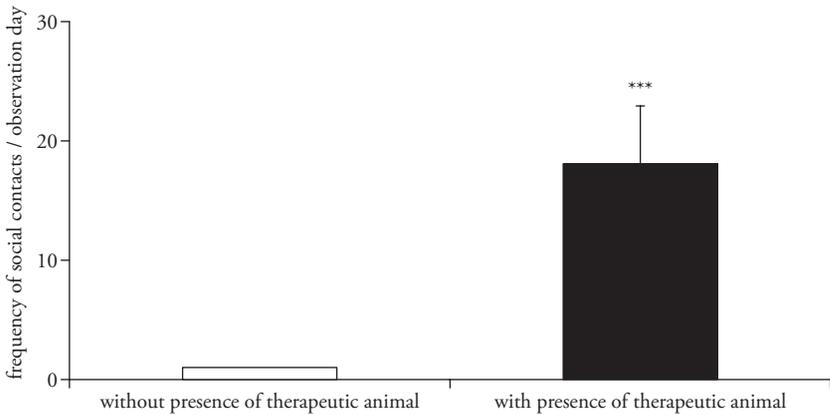


Figure 1. The social contacts of autistic children ( $n = 9$ ) with acquaintances without or with the presence of the therapeutic animal. Data is given as one proband average  $\pm$  S.E.M. per observation day. Asterisks indicate significant differences between time without and with the animal presence (\*\* $P < 0.001$ ).

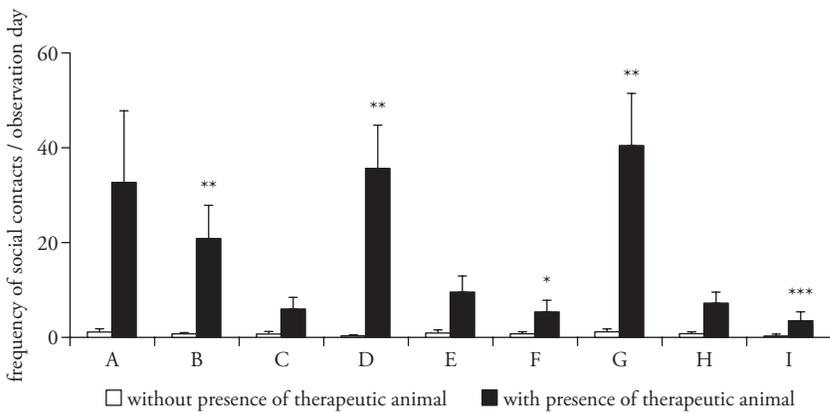


Figure 2. Individual differences among autistic children (A-I,  $n = 9$ ) in social contacts with acquaintances without or with the presence of therapeutic animal. Data is given as average  $\pm$  S.E.M. per observation day. Asterisks indicate significant differences between time without and with the animal presence (\*  $P < 0.05$ , \*\*  $P < 0.01$ ).

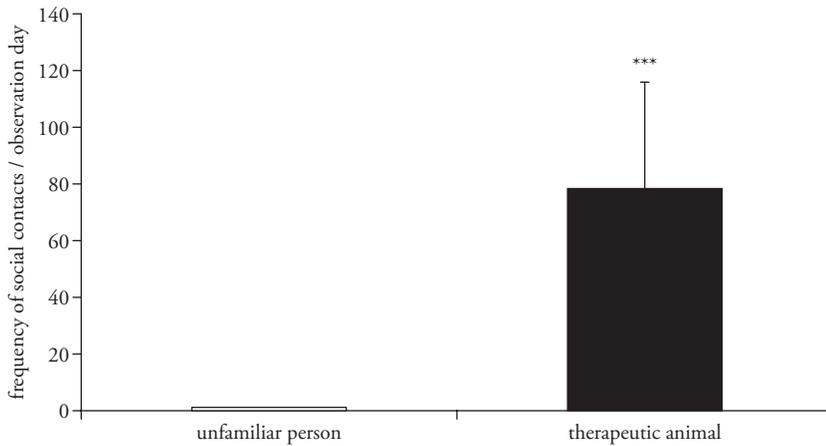


Figure 3. Social contacts of autistic children ( $n = 9$ ) with the unfamiliar person and therapeutic animal. Data is given as average  $\pm$  S.E.M. per observation day and person. Asterisks indicate significant differences between the time spent without and with the animal (\*\*\*)  $P < 0.001$ .

Each child (with the exception of child I) had significantly more contacts with the therapeutic animal than with the unfamiliar person (Figure 4).

The contacts of the children with the unfamiliar person were highly individual in nature. Child C did not have any contact with the unfamiliar person. Children A and F preferred tactile contact, child G preferred verbal contact, and children B, D, E, H, and I preferred to make eye contact with the unfamiliar person.

Furthermore, contacts with the therapeutic animal were individually characteristic (Figure 5). Children B, D, F, and G preferred to make tactile contact with the animal. Children A, C, E, H, and I preferred eye contact with the therapeutic animal. None of the children preferred to make verbal contact with the therapeutic animal.

The presence of the therapeutic animal influenced the percentage of social behavior components (tactile, verbal, and eye contacts) with acquaintances. The presence of the animal changed the preferred type of contacts with acquaintances in children A, C, G, and I. The types of preferred contact of the autistic children with acquaintances were unchanged, however, in children B, D, E, F, and H.

Some social behavior components of the autistic children were observed only in the presence of the therapeutic animal (Table 2).

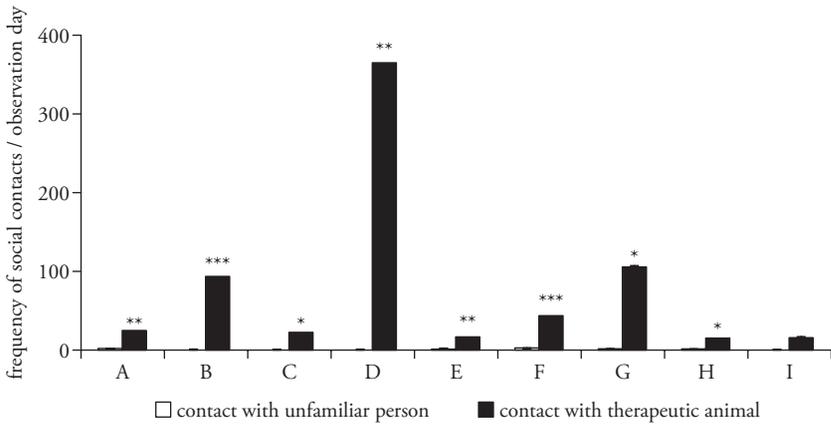


Figure 4. Individual differences among autistic children (A-I,  $n = 9$ ) in social contacts with an unfamiliar person and with the therapeutic animal. Data is given as average  $\pm$  S.E.M. per day. Asterisks indicate significant differences between the time spent without and with the animal presence (\*\*\*)  $P < 0.001$ ).

**Table 2. Some social behavior components of the tested children.**

Code of child* ( $n = 9$ )	Behavior
A	intensive kissing of human
B	some gentle motor movements observed only in relationship with guinea pig
C	–
D	maternal behavior in relationship with guinea pig, behavior toward child G
E	–
F	verbal social communication
G	tactile contacts, behavior toward child D
H	tactile contacts, social competitive behavior—competition about guinea pig
I	verbal social communication

\* Real names of the observed children have been concealed, and they were marked with a letter of the alphabet.

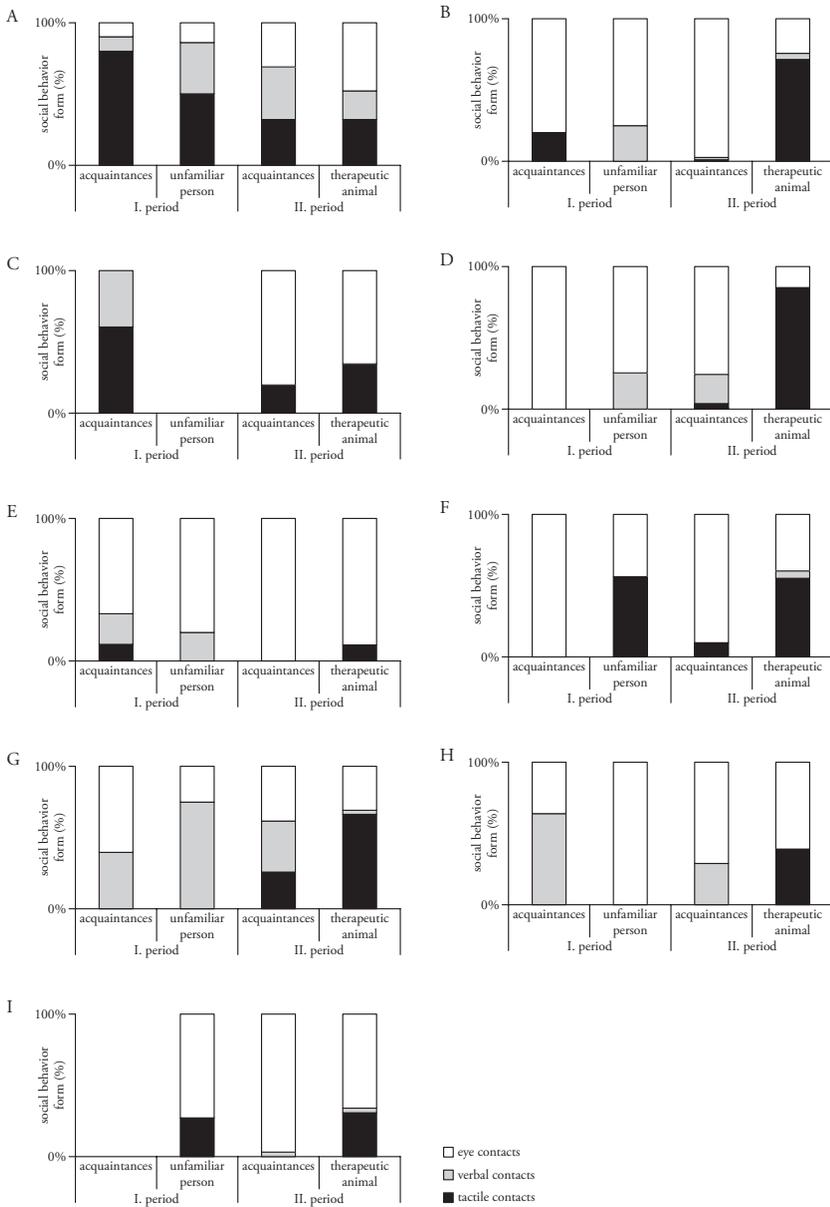


Figure 5. Social behavior components observed only during presence of therapeutic animal.

## **Discussion**

We observed quantitative and qualitative differences in the social behavior of autistic children with and without the therapeutic animal (guinea pig) in the classroom. The guinea pig had positive effects on the quantity of social interaction and increased the frequency of social contacts of autistic children with their acquaintances. In the scientific literature, valid information about the effect of guinea pigs on autistic social behavior is missing, but the positive effect of these animals on the frequency of cooperation and social behaviors among Asperger's and ADHD children has been verbally described (Baucum, 2008).

Children with pervasive developmental disorders/autism demonstrated a higher level of interpersonal skills and were more socialized after therapy involving other animal species (Carenzi & et al., 2008; Ming-Lee, 2008; Barol, 2006; Rao, 2006; Brown, 2005; Martin et al., 2002; Servais, 1999; Brown, 1996; Law & et al., 1995; Redefeer et al., 1989). Furthermore, a marked improvement in social interactions, eye contact, nonverbal expressions, and facial expressions was shown when autistic children interacted with a therapy dog (Rao, 2006). We suppose that contact (especially nonverbal) with a therapeutic animal may be a more understandable stimulus for an autistic child and that such contact may initiate changes leading to positive social contacts with other people.

The response of the autistic children studied here to the guinea pig was very individual. The presence of the guinea pig increased the frequency of social contacts in five out of the nine autistic children. We found significant effects of the therapeutic animal on the character of social interaction of the autistic children. Some children demonstrated behaviors that were not observed in the absence of the therapeutic animal. A particularly interesting situation occurred when the animal played a role in an interaction between girl D and boy G. During the collective stroking of the animal, we noted an increased reciprocal contact of hands. These tactile contacts were accompanied by a simple eye wink and verbal communication of the boy with the girl about the guinea pig. In the absence of the animal, no significant social contacts between D and G were observed.

Emotionally disturbed children who have experienced difficulties in their relationships with people can more easily or quickly establish relationships with animals (Levinson, 1969). Our observations also suggest a strong preference for contacts with the guinea pig over contacts with an unfamiliar person; the children (with the exception of one) made contacts with the guinea pig more frequently than with the unfamiliar person.

Furthermore, according to McNicholas et al. (1995), autistic subjects display behavior toward pets that they rarely, if ever, display toward human companions, and our study bore this out. One of the children in our study—a thirteen-year-old girl—manifested what appeared to be maternal behavior toward the animal, taking the guinea pig in her hands and cradling him in her chest area as a mother cradles her child.

In our study we observed three basic types of social contacts: tactile, verbal, and visual. Preferred types of contact with the therapeutic animal were individually dependent. Some children preferred tactile contact and others preferred eye contact. No child preferred verbal contacts with the guinea pig, which is in line with the expectation that children usually prefer nonverbal communication with animals (Prothmann, & et al., 2005; McConnell, 2002; Levinson, 1970). Tactile contacts of the autistic children with the guinea pig took the form of stroking, a touch, or a gentle pinch. Some children took the animal from his plastic cage, but others preferred contact with the guinea pig in the cage. The children did not exhibit aggressive behaviors toward the therapeutic animal, and the guinea pig never exhibited aggressive behavior toward the children. Nonconflict interactions of the children with the guinea pig suggest that this animal is suitable for school-age children or for children with a handicap (Banks, 1989; Burch, 2003).

Contacts with the unfamiliar person were very individual as well. The majority of children preferred eye contact and one child showed no contact with the unfamiliar person at all. The presence of the therapeutic animal influenced the preferred type of social contacts with acquaintances in four of the children. One child did not have contact with acquaintances at all during the first observation period, but in the presence of the guinea pig he had eye and verbal contacts with these people. The contacts of five children with acquaintances did not change, however, after the introduction of the therapeutic animal.

Our results suggest that the presence of “small great” guinea pig therapists can positively influence the quality and quantity of social behavior in autistic children. The presence of a guinea pig increased the frequency of social contacts with acquaintances, and the children exhibited some aspects of social behavior that they did not exhibit in the absence of the therapeutic animal. The benefit of guinea pig therapists lies not only in their small size, but also in a docile disposition, simple breeding, and their ability to be a stable part of a class or a family with autistic children.

## References

- American Psychiatric Association. (2000). Diagnostic and statistical bowel disease and autism. *Digestive Diseases and Sciences*, *45*, 723-729.
- Autism Service Dogs of America. (2004-2008). How do service dogs help children with autism? Retrieved September 21, 2008, from <http://autismservicedogsofamerica.com/autism.cfm>.
- Banks, R. (1989). The guinea pig: Biology, care, identification, nomenclature, breeding, and genetics. In *USAMRIID Seminar series*. Retrieved January 8, 2010, from <http://netvet.wustl.edu/species/guinea/guinpig.txt>.
- Barol, J.M. (2006). The effects of animal-assisted therapy on a child with autism. Retrieved December 20, 2008, from [www.dogwoodtherapy.com/documents/researchpaper.doc](http://www.dogwoodtherapy.com/documents/researchpaper.doc).
- Baucum, E. (2008). Little autism patients find furry therapy. Retrieved December 12, 2008, from <http://ozarksfirst.com/content/fulltext/?cid=43771>.
- Bodfish, J.W., Symons, F.J., Parker, D.E., & Lewis, M.H. (2000). Varieties of repetitive behavior: Comparison to mental retardation. *Journal of Autism and Developmental Disorders*, *30*, 237-243.
- Brown, H.M. (1996). "Intrusion" and interaction therapy for riders with autism. In *NARHA Strides Magazine* 2 (3). Retrieved August 14, 2007, from [http://www.narha.org/PDFfiles/tr\\_autism.pdf](http://www.narha.org/PDFfiles/tr_autism.pdf).
- (2005). Horse therapy—Changing lives. In *Your Horse Magazine*. Retrieved August 14, 2008, from <http://www.wayofthehorse.org/Articles/horse-therapy.html>.
- Bryant, B.K. (1985). The neighborhood walk: sources of support in middle childhood. *Monographs of the Society for Research in Child Development*, *50*, 1-122.
- Burch, M.R. (2003). *Wanted!: Animal volunteers*. New York: Howell Book House.
- Carenzi, C., Galimberti, M.M., Buttram, D.D., & Previde, E.P. (2008). The effects of animal-assisted therapy (AAT) on the interaction abilities of children with autism. Paper presented at the 11th International Conference on Human-Animal Interactions, *People & animals: Partnership in harmony*, Tokyo, Japan. Retrieved December 27, 2008, from <http://www.deltasociety.org/Document.Doc?id=246>.
- Condoret, A. (1983). Speech and companion animals: Experience with normal and disturbed nursery school children. In A.H. Katcher & A.M. Beck (Eds.), *New perspectives on our lives with companion animals* (pp. 467-471). Philadelphia: University of Pennsylvania Press.
- Delta Society. (2009). Animal-assisted therapy (AAT). Retrieved January 8, 2010, from <http://www.deltasociety.org/Page.aspx?pid=320>.
- Edelson, S.M. (2009). Social behavior in autism. Retrieved January 8, 2010, from <http://www.devdelay.org/newsletter/articles/html/133-social-behavior-in-autism-spectrum-disorders.html>.
- Henry Spink Foundation. (2008). TEACHH—(Treatment and Education of Autistic and Related Communication Handicapped Children). Retrieved December 2, 2008, from <http://www.henryspink.org/teach.htm>.
- Hyson, M.T. (2007). Dolphins, therapy and autism. Retrieved October 3, 2007, from <http://www.planetpuna.com/dolphin-paper-html/dolphin-paper.htm>.
- Kanner, L. (1943). Autistic disturbances of affective contact. *The Nervous child*, *2*, 217-250. Reprinted in *Acta Paedopsychiatrica*, *35*, 100-36, 1968.
- Krishna, N. (2006). Dr. Dog—A program for children with autism. Retrieved December 28, 2008, from <http://www.autismindia.com/article 14.htm>.
- Landa, R. (2007). Early communication development and intervention for children with autism. *Mental Retardation Developmental Disabilities Research Review*, *13*(1), 16-25.
- Law, S., & Scott, S. (1995). Tips for practitioners: Pet care: A vehicle for learning. *Focus on Autistic Behavior*, *10*(2), 17-18.

- Levinson, B.M. (1969). *Pet-oriented child psychotherapy*. Springfield, IL: Charles C. Thomas.
- . (1970). Pets, child development and mental illness. *Journal of the American Veterinary Medical Association*, 157, 1759-1766.
- Martin, F., & Farnum, J. (2002). Animal-assisted therapy for children with pervasive developmental disorders. *Western Journal of Nursing Research*, 24, 657-670.
- McConnell, P. (2002). *The other end of the leash: why we do what we do around dogs*. New York: Ballantine Books.
- McNicholas, J., & Collins, G.M. (1995). Relationships between young people with autism and their pets. In 7th International Conference on Human-Animal Interactions, *Animals, Health and Quality of Life*, September 6-9, Geneva, Switzerland.
- Ming-Lee, Y. (2008). Canine animal-assisted therapy model for the autistic children in Taiwan. Presented at the 11th International Conference on Human-Animal Interactions, *People & Animals: Partnership in Harmony*, Tokyo, Japan. Retrieved December 27, 2008, from <http://www.deltasociety.org/Document.Doc?id=241>.
- Noens, I., van Berckelaer-Onnes, I., Verpoorten, R., & van Duijn, G. (2006). The ComFor: an instrument for the indication of augmentative communication in people with autism and intellectual disability. *Journal of Intellectual Disability Research*, 50(9), 621-632.
- Panchak, P. (2008). Rats are bringing out best in kids with autism. Retrieved December 20, 2008, from <http://www.post-gazette.com/pg/08164/889198-55.stm?cmpid=neighborhoods.xml>.
- Prothmann, A., Albrecht, K., Dietrich, S., Hornfeck, U., Stieber, S., & Ettrich, C. (2005). Analysis of child-dog play behaviour in child psychiatry. *Anthropozoös*, 18(1), 43-58.
- Rao, V. (2006). Animal therapy and expression in autistic children. Retrieved September 13, 2008, from <http://www.animalangels.org.in/aa/cONFERENCE.htm#vishakha>.
- Redefer, K., & Goodman, J. (1989). Brief report: Pet-facilitated therapy with autistic children. *Journal of the Autism and Developmental Disorders*, 19, 461-467.
- Salomon, A. (1981). Animals and children: The role of the pet. *Canada's Mental Health*, 29, 9-13.
- Servais, V. (1999). Some comments on context embodiment in zootherapy: The case of the Autodolfijn project. *Anthropozoös*, 12(1), 5-15.
- Sigman, M., Dijamco, A., Gratier, M., & Rozga, A. (2004). Early detection of core deficits in autism. *Mental Retardation and Developmental Disabilities Research Reviews*, 10(4), 221-233.
- Sigman, M., Spence, S.J., & Wang, A.T. (2006). Autism from developmental and neuropsychological perspectives. *Annual Review of Clinical Psychology*, 2, 327-355.
- Smith, B.A. (1984). Using dolphins to elicit communication from an autistic child. In R.K. Anderson, B.L. Hard, & L.A. Hart (Eds.), *The pet connection: Its influence on our health and quality of life* (pp. 154-161). Minneapolis: University of Minnesota, Center to study Human-Animal Relationships and Environments.
- Stout, R. (2001). Sean and Rocky: A special needs boy and his ferret take on the world. Retrieved January 8, 2010, from <http://www.modernferret.com/mfm029/seanandrockyforweb-2a.pdf>.
- Tager-Flusberg, H., & Caronna, E. (2007). Language disorders: Autism and other pervasive developmental disorders. *Pediatric Clinics of North America*, 54, 469-481.
- Volkmar, F., Chawarska, K., & Klin, A. (2005). Autism in infancy and early childhood. *Annual Review of Psychology*, 56, 315-336.
- Wobus, J. (2008). Autism FAQ—Treatment. Retrieved January 20, 2009, from <http://www.autism-resources.com/autismfaq-trea.html>.