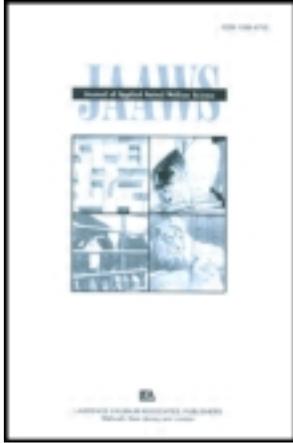


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Factors Affecting Behavior and Welfare of Service Dogs for Children With Autism Spectrum Disorder

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The use of service dogs for children with autism spectrum disorder is a relatively new and growing assistance-dog application. The objectives of this article were to identify and describe the factors influencing an autism service dog's performance and the impact of this type of placement on the dog's welfare. A qualitative approach uses interview and observational data to characterize the dogs' behaviors and welfare with relevancy to the dogs' home environments. Identification of potential physical stressors included lack of rest or recovery time after working, unintentional maltreatment and prodding by children with autism, lack of predictability in daily routines, and insufficient opportunities for recreational activities. Results revealed that these dogs formed social relationships primarily with the parents and second with the children with autism. Failure to recognize and respond to the identified physical, emotional, and social needs can have serious impacts on the behavior, welfare, and performance of these autism service dogs, as well as parental satisfaction. As applications of service dogs expand to new domains, there is a need to assess and understand factors and variables affecting the relationship between family and service dog to ensure continued success of these programs.

The use of service dogs for children with autism is a new and growing application of trained dogs. The first service dog was placed with a child with autism in 1997 by National Service Dogs, a Canadian training organization. Each year, the number of placed dogs continues to rise as families apply to service dog organi-

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zations. National Service Dogs has trained and placed 92 dogs for children with autism, an average of 10–16 dogs per year. Their training program is similar to guide dog training programs, consisting of a 12–18 month puppy-raiser placement, in which puppies are placed with foster families who work on socialization, basic obedience, and public outings in service jacket. This is followed by advanced training for 6–8 months, in which puppies return to the kennel for suitability testing and—if successful—receive advanced obedience training, distraction training, and training in busy environments such as shopping malls. Fully trained service dogs are placed between 18–24 months of age. Each dog is matched to a child with autism, and the parents learn to work with the dog during a training week before bringing the dog home.

Public contact requires identification and acceptance of a working dog. Retriever breeds are selected for this type of service work because of their temperament, stable personalities, physical size, tractability, and trainability (Burghardt, 2003; Weiss & Greenberg, 1997). The primary function of a service dog for autism is child safety. These selectively bred dogs (Golden Retrievers and Labrador Retrievers) are trained to slow small children on command to prevent children from bolting into traffic. Hence, the physical ability of the dog to restrain a child must be taken into consideration when the dog is placed into a particular home. The child with autism is attached to the dog via a leash and belt system (Figure 1), and the dog responds to commands from the parent (handler) to proceed forward in a straight line, turn left or right, and to stop. If the child approaches a curb or tries to walk off the sidewalk, the dog will use all his power to brace his footing to slow the child down and stop. This gives the parent walking behind the child time to intervene (National Service Dogs, 2003).

This is a unique triad compared to traditional assistance-dog uses such as guide dogs or physical disability dogs. The dog must walk with the child but take commands from a parent (handler) following behind. National Service Dogs recommends that the parents limit or prevent other members of the family from interacting with the dog to facilitate the relationship between the service dog and the child with autism. In addition, children on the autism spectrum exhibit a wide range of developmental disabilities, communication abilities, motor skills, and behaviors, presenting additional challenges when being matched with a service dog. Conversely, other assistance dog applications are trained for a much more uniform population, such as guide dogs or physical disability dogs.

Given the novelty of this service-dog program, it is imperative to closely monitor and evaluate the welfare of dogs placed in homes with children with autism. Assessing the welfare of these dogs is challenging due to variations in daily stressors and home environments, based on the routine and lifestyle of the families. Satisfaction and predictability of basic physical needs (food, water, shelter), a high degree of biological functioning and health, opportunities for social interaction and environmental control, opportunities for pleasure and minimal distress are



FIGURE 1 Demonstration of typical harnessing arrangement, with child with autism attached by a belt to the dog's jacket and the parent/handler providing verbal commands and direction through the dog's leash.

proposed constituents of optimal quality of life in dogs (Wojciechowska & Hewson, 2005). The welfare of the individual dog may at times compete with the needs of the program to produce and maintain a sufficient number of dogs capable of performing the tasks associated with their application (Burghardt, 2003). In addition, failure to evaluate dogs within these homes may put dogs at risk for health or behavioral problems and could put the children or other family members at risk if the dog's behavior changes (Love & Overall, 2001). Minor conflicts between the dog and handler could impair the dog's performance as a service animal or could result in canine aggression, a behavior that would be high risk in any family. Identifying factors that dogs may perceive as threatening enables owners to predict and preempt many instances of potential aggression (Shepard, 2002). Canine aggression is particularly crucial to avoid around a child with autism due to the child's inability to correctly attend to and interpret the dog's social signals. Complex situations require substantial time and energy commitments by the parent to ensure a safe and healthy dog-child relationship (Love & Overall, 2001), especially in environments with behaviorally challenged children.

Because these techniques have been useful for the assessment of animal temperament and personality, this qualitative assessment of service-dog welfare and factors influencing the dog's performance as a service animal was chosen as an

appropriate method for evaluating the novel use of these particular service dogs. The qualitative summary of the service dog's ongoing behavior can assist in characterizing the dog's experience in particular situations and, as such, reflects on the dog's welfare (Wemelsfelder, Hunter, Mendl, & Lawrence, 2000).

An assessment of behavior and welfare in these service dogs is integral to fully understanding the use of service dog within these families. The objectives of this study were to identify and describe factors that influence a service dog's ability to work effectively within the home of a child with autism and that influence the dog's welfare, as described through various physical and psychological factors.

METHODS

Study Design

This study consisted of following 11 service dogs as they were placed into homes with children with autism in November 2003 and May 2004. The study conducted five home visits and interviews for 5 service dogs who were followed for 12 months and three home visits and interviews for 6 dogs who were followed for 6 months (Table 1). The study conducted 36 interviews that ranged from 35 min to 2 hr.

A qualitative approach involving interview and casual observational data was used to inductively describe both types and patterns of animal behavior in natural settings and the experiences of the parents of the children with autism. The goal was to identify and describe important patterns of behavior in the interactional relationships among service dog, child with autism, and family members. Qualitative methods allow for a combination of observation with other data collection strategies to increase the completeness and understanding of a poorly understood phenomenon from the perspectives of the participants (Morgan & Drury, 2003).

The experimental protocol was reviewed, and it received ethics clearance through the University of Guelph Research Ethics Board and the Animal Care Committee, in accordance with the Canadian Council for Animal Care.

TABLE 1
Schematic of Interview Process, November 2003–November 2004

<i>Service Dog Placement</i>	<i>November 003</i>	<i>February 2004</i>	<i>May 2004</i>	<i>August 2004</i>	<i>November 2004</i>
Group 1	4 dogs placed Interview 1	Interview 2 3-month follow-up	Interview 3 6-month follow-up	Interview 4 9-month follow-up	Interview 5 (12-month follow-up)
Group 2	—	—	6 dogs placed Interview 1	Interview 2 3-month follow-up	Interview 3 (6-month follow-up)

Participants

Recipient parents of service dogs were approached to participate once National Service Dogs had approved them for placement. Prior to asking for study participation, each dog was selected specifically for each child by National Service Dogs, based on home visits and the temperament of both child and dog. To balance temperaments, quiet, calm dogs are placed with energetic children, and energetic service dogs are matched to children who are more reserved. The welfare of the dog can be a critical factor in determining whether the child with autism should even receive a service dog—based on the child's ability to interact well with the dog.

Only dogs placed in South Western Ontario were selected to participate, and their handlers (parents of the children) were approached by the researcher through an introductory letter. This convenience sample was selected due to the relatively small number of dogs trained and placed within the study period. The researcher met with the parents during the National Service Dogs' training week to distribute consent forms and to answer questions. Informed consent was obtained from all participants. Procedures were clearly delineated for withdrawing from the study and for accommodating those individuals who did not want to participate in the study. Strategies to maintain confidentiality of data were strictly followed.

Data Collection

Parents were interviewed during the training week when they received their dogs and at 3-month intervals after the dogs had gone home to their assigned families. A 3-month period was selected based on the time commitment required by the families and on anecdotal evidence suggesting that integration of a service dog into a home is a relatively slow process. In addition to the interview, the researcher accompanied and observed the parent, service dog, and child with autism in a number of settings: car rides, local mall, walking/recreational activities, and in the classroom. Collecting information through the interview process ensured that the dog's behavior and welfare were characterized using the parents' language and perspectives—with relevance to the dogs' home environment.

Semistructured and open-ended interviews were conducted with semistructured questions designed for the first interview to direct the parents to talk about the following:

1. Dog's behavior,
2. Interactions with the family,

TABLE 2
Interview Prompts and Sample Questions

Questions and Prompts

How did the dog react?
 Can you describe how the dog behaves when ____? (in jacket, in public, at home)
 Can you describe dog's behavior in and out of the service jacket?
 Can you describe what the dog does when ____?
 How can you tell when the dog is tired/stressed/happy/anxious?
 You said the dog can sense ____? How would you describe that?
 Can you please describe the dog's daily routine?
 ... And the dog tolerates that?
 How would you describe your dog's temperament/personality?
 How does the dog interact with the different members of your family?
 Do you have any concerns about how the dog has reacted to ____?
 How is training going?

3. Training problems,
4. Their expectations of the dog within the context of their family, and
5. Successful events that occurred when using the service dog (Table 2).

The analysis of the first set of interviews formed the basis of the coding system and line of questioning for future follow-up interviews. This open-coding system of the interview transcripts allowed for concurrent data collection and analysis. Because some questions were not applicable to every dog, follow-up, semistructured interview questions were tailored to each individual dog while still reflecting the overall research objectives. Moving from semistructured to open-ended interview questions allowed the participating parents to disclose extra information about the service dogs that may have been missed in the predesigned line of questioning. Open-ended interviewing revealed new themes and categories, allowing new questions and experiences to emerge from the data. In the process of final data analysis, it was evident that interviewing the parents through the use of semistructured questions, open-ended questions, and specific prompts garnered a significantly detailed understanding of the reality of everyday life for these dogs.

Analysis

Digital recordings of the interviews were transcribed verbatim by a professional typist and were checked for accuracy by the researcher. The researcher's observations were recorded and added to the final interview transcripts. The tran-

scripts were coded for any reference or mention of events/factors relating to the benefits of the service dog for the child with autism or the family in order to develop general coding categories. Persistent themes and phrases, in addition to data anomalies (i.e., a specific event that stood out from other observations) were identified and once coding was complete, these themes and phrases were organized in a computer word processing program (Carney, Joiner, & Tragou, 1997). For example, “The dog has been my shadow for three months now ...” was coded for canine behavior and identified as “social behavior.” This quote was therefore copied and pasted into a word file labeled “social behavior.” The coding files were carefully checked for validity and reliability by coding an unmarked copy of a transcript and comparing it with the original transcript. Analysis was done within each specific family/dog and repeated again with the entire group of service dogs in order to identify codes and categories specific to the group of service dogs, while also considering their individual environments and extraneous factors.

Specifically, the data analysis included the following:

1. In-depth description of what the dogs are trained for and their roles as service dogs within families with children with autism; and
2. Identification of potential physical and psychological stressors, with careful observation of what the implications were on the dog’s performance and welfare.

These two components were achieved by thoroughly questioning the parents about their direct observations of the dog in combination with the researcher’s observations.

Data analysis concluded when the researcher was satisfied that the data was saturated, both at the participant and sampling level. Data saturation occurred when no new information was revealed during the interview process, and the information revealed in the interviews started to become redundant.

RESULTS

Demographics

There were 11 dogs—6 males and 5 females. The dogs were specially bred Golden Retrievers and Labrador Retrievers, for a total of 2 Golden Retrievers, 4 Black Labs, 4 Yellow Labs, and 1 Chocolate Lab. Dog 9 was retired permanently after 9 weeks of placement due to unwanted behaviors (as discussed later), and the family received a second dog 2 weeks later. This dog (Dog 10)

was a more successful placement and, at the conclusion of the study, continued to work for the child and family. Dog 5 was returned to the training facility, re-trained, and placed with another family. The original family chose not to receive a second, replacement service dog until their lifestyle was more settled.

Performance: The Service Dog at Work

The primary function of a service dog for autism is child safety. The service dog is trained to physically prevent the child from bolting into the street or away from his or her parents in public. When in jacket, dogs consistently kept the children safe by physically stopping them from bolting.

The dog had barked to alert us that [my child] actually hurt himself ... I was very pleased that [the service dog] let us know that there was an issue.

When wearing a service jacket, the dog is expected to follow commands from the parent, ignore distractions, stop at open doorways, and not urinate or defecate. The dogs were all reported to behave extremely well while in jacket, but behavior out of the service jacket was varied.

In harness, he is as proud as proud as could be. His whole stance changes ... out of harness, he's just a dog.

He's much much more relaxed (with the jacket off). ... When [the dog] is in jacket, he's much more disciplined and focused.

None of the dogs except Dog 11 attempted to avoid being put into a service jacket. Parents reported that the dogs looked excited to be going out with the families; in many cases, a dog would pick up the leash or jacket while waiting to go out the door.

He looks forward to working, actually ... he carries [the leash] around and he's waiting to go and he's parked himself at the front door there on the mat ... he'll sit their patiently and wait and it's into the van we go ... he's happy to go.

Dog 11 was reported to resist his service jacket and attempted to avoid the parent when he was called over to put it on. The parent attributed his reluctance to laziness. However, the researcher observed that during the first 6 months of placement, the dog had become considerably overweight and no longer fit into his jacket comfortably. This obesity factor, in addition to poor maintenance of the dog's training, may have led to confusion on the dog's

part as to what he was supposed to be doing in jacket. The researcher noted that the dog appeared to be uncomfortable and did not settle down in his jacket as the other dogs did.

The parents reported that the presence of the dog immediately alleviated their safety concerns for their child. Within days of placement, the parents felt more secure walking with their child, now that the child was attached to the service dog. In one case, however, this attachment put the child's safety at risk because the parents were not able to control the dog.

I turned my back for one second ... and I had [service dog] in the "stay" position. I turn around and the next thing I know [the dog] takes off after [another] dog. Well, [my autistic child] is attached (to the dog), so [autistic child] was running for a little bit and ... couldn't keep up. He just dropped, and he got dragged right across the track, right across the grass with the dog.

Dog 9 was returned to National Service Dogs after this incident occurred, approximately 9 weeks after the dog had been placed in the home. The parents struggled with their decision to return the dog but realized that they were unable to control the dog and were therefore putting their child at risk for injury. This incident was the only major safety concern among all of the participating service dogs; the dog was promptly retired from service and was adopted by the initial puppy-raiser family. The family received a different dog, Dog 10, shortly after their first dog was returned and reported to the researcher that they were extremely satisfied with their new dog.

Dog 5 was also returned to National Service Dogs approximately 3 weeks after placement due to minor behavioral and temperament issues (chewing, dog was too energetic for the child). The timing of the placement of Dog 5 was not conducive to integrating the dog into the home due to some family issues. This was the main reason the dog was returned, in addition to the dog's unwanted behaviors. Fortunately, Dog 5 was returned to the kennel and was eventually placed with a different family whose child was a better match for the dog's temperament and activity level.

Physical Factors

A number of key physical factors affected the dogs' behavior and welfare. These included factors causing physical stress, maintaining the dogs' health, rest/recovery time, and recreational activities. The service dogs were exposed to a number of physical stressors, including lack of relief time for urinating or defecating, being in the jacket for long periods of time, and unprovoked negative attention from the child with autism.

Although not intentional, the children with autism were significant sources of physical stress for the dogs. Dogs were often woken from sleep either during the night by a child becoming unsettled or during the day while the dog was napping.

[Our child] would go 2 days before he would sleep ... the poor dog, ... he was up constantly ... [our child would] be in and out of there every ten minutes and the poor dog was right there beside him because he knows he has to follow him and in and out and in and out, and the poor dog would get exhausted too. ... He did a good job ... but you could see the look on his face like when am I going to get some sleep too?!

When children would not stay in bed, dogs spent a portion of the night following them and were reported to appear exhausted and performed poorly the following day. Parents who recognized the dog's need for rest came up with solutions such as giving the dog somewhere else to sleep or giving the dog a day off. Tired dogs were sometimes reluctant to even accompany children to bed. The dogs did not object to being sat on, pulled by the tail or collar, and thoroughly investigated by inquiring hands.

... [service dog] is so, so tolerant. And [my child] will ... sometimes sit on him ... and he just, he puts up with it all—it's quite amazing.

Children with autism often exhibit "meltdowns" or aggressive behavior. This behavior was often directed at the dog because it was the closest target for the child's anger. Some of the more aggressive children would hit or thrash out at the dog, startling the dog and causing the dog to move away from the source of physical abuse. Fortunately, the dogs developed a learned sense of when to move in to distract or comfort the child and when to move away to avoid the child's anger.

[The service dog] knows the difference between [her] cries ... one, to go away because he's about to get thumped because she's angry ... when she starts to really cry, he kind of looks at us for direction. Like do I go or do I stay? He just cowers and hides and waits until she stops ... but absolutely zero aggression. When [service dog] thinks she's being too rough on him ... he leaves. He somehow knows the different between like a cry of being upset and frustrated ... versus [being] ... angry about something. He knows when he's gonna get hit and he should get out of there, and he knows when he should stick around.

After the first few months of placement (1–3 months), the dogs developed an ability to interpret the child's behavior and discriminate touch investigations from physical threats.

... if you just noticed, [service dog] was lying in the doorway, [my child] started to fuss and scream and kind of be loud and boisterous in the living room ... which is

usually the escalation of her starting hitting something, so he left and came and laid down [in the kitchen] ... if I call him back into the living room, he'll go back and lie down with her.

In these situations, dogs who are able to predict the outcome of the child's behaviors avoid potential abuse and do not retaliate or show any forms of aggression. On one occasion, Dog 5 growled after the child tried to crawl on his back, minutes after the dog had been introduced into the home. Dog 3 growled after the child had been touching different regions of the dog and was poking and pulling on the pads of the dog's feet, suggesting that the dog had reached his threshold of tolerance. This incident occurred in the child's bedroom, and the dog did not have an opportunity to leave the room. By successfully interpreting the child's behavior, the dogs were able to keep at safe distances from the children during more volatile situations.

Although physical stress inflicted by the children with autism had significant influence by startling or frightening the dogs, there were many instances where dogs received affection from either the child or parent. Parents were able to use the dogs to teach the children how to properly pet and groom an animal. This, in turn, ensured that both the child and dog were comfortable with one another, and the dogs benefited from the physical attention received.

Physical and psychological stress that occurred when dogs had been in jacket for most of the day was reported by the parent. Some dogs attend school all day with the child and remain in jacket and "on duty." These dogs appeared to be exhausted and required significant rest-recovery time upon returning to the home. It is understandable that the dogs require appropriate recovery time after spending a significant portion of the day working, due to restrictions on drinking, eating, defecating or urinating, in addition to the physical stress of preventing the child from bolting. Recreational activities and exercise, availability of food and water, and opportunity for uninterrupted sleep were all important components to give dogs some recovery or rest time. Failure to give the dog some time off, especially for dogs placed in schools with the children, resulted in dogs being less responsive to parental commands and poor performance later in the evening. Many dogs were exercised daily to maintain body weight and to allow the dog to burn off some energy before being put in jacket.

One of the factors influencing success of placement of these dogs was predictability of daily activities. Dogs who were placed into the school systems settled in faster due to the common daily routine of getting ready to go to school, being transported to school, and school scheduling—a set recess, lunchtime. Evidence that dogs were stressed included physical cues from the dog and alterations in behavior. Growling, overexcitability, and defecating/urination in the home were seen when dogs appeared to be stressed due to changes in the normal daily family routines (returning home after spending summer at cottage).

We have a bit of a changing routine in the morning, that sometimes we get up at 5:30 and we walk with [the service dog] at six, and other times it doesn't happen until later in the day and sometimes not at all until the end of the day.

This particular service dog would occasionally urinate and defecate in the bedroom early in the morning. The parent admitted to having an inconsistent schedule and failed to recognize the potential links between the dog's behavior and the family's schedule. The family made numerous trips to their cottage, so this remained a frequent stressor. Accidents such as these had a significant impact on the parents' satisfaction with the dog.

Keeping dogs well groomed, clean smelling, and free of knots in the coat; cleaning discharge around the eyes and nose; and clipping nails are essential to the dog's appearance in public as a service animal and to maintenance of the dog's health. There were a number of health concerns, including kennel cough (from training center), minor ear and eye infections, and more significant illnesses. Dog 1 developed a malignant tumor on his hind leg, and Dog 6 developed a life-threatening allergic reaction. In both cases, the dogs were unable to work while recuperating from their illnesses. Health concerns are a worry for any animal caregiver, but are particularly significant when service dogs are affected due to effects on the child and family.

One final component of proper health care is body condition. National Service Dogs recommends that dietary rations are carefully measured to prevent overfeeding. Dog 11 began gaining weight as soon as he was placed in the home, likely due to overfeeding and insufficient recreational activities. Although heavier dogs are selected to successfully brace against a bolting child, obesity affected the fit of the service jacket and energy level of the dog, making it difficult to motivate the dog to go out or to maintain the dog's performance and training.

Social Interactions

In addition to child safety, many parents expected the dogs to bond with their children and to provide companionship. During the training week, when parents first received the dogs, the dogs quickly bonded to the parent but still looked to the National Service Dog trainers for direction. During this initial phase, dogs responded to the presence of the trainers and ignored the parents' commands. The dogs went home with the families after the training week and quickly started bonding with the parent with whom they had spent the week. As time progressed, the dogs became more interested in following and spending time with a particular parent. In follow-up training visits, the dogs showed no increase in excitement when the trainers visited them. At the 6-month graduation, the dogs were completely unresponsive to the trainers, suggesting they had set-

tled with the parent/handler with whom they were currently working. On most occasions, dogs continued to seek or initiate behavior from the parent (primary handler). If ignored, dogs moved on to the child with autism, depending on how strict the family was about limiting family member contact with the dog. Parents varied in how strict they were about limiting family contact with the dog outside of the child with autism. Dogs would initiate contact with the handler or child by nosing at the person's hands or by lying down in close proximity. The dogs worked hard to find a place in the family, and it was hard for families to limit them to interact with one child.

[The other kids in the family] touch [the service dog]. The whole point was that the [other] kids like [the service dog] as well because if it was just, well, it's [autistic child]'s dog, that would be a lot harder trying to tell the other kids also that you can't touch the dog, you can't play with the dog.

In terms of social bonding, the service dogs were most closely bonded to the primary handler—one parent and, in most cases, the parent who spent the greatest amount of time with the child. During the first 3 months of placement, the dogs looked to this primary handler for direction and affection. The dogs were very devoted to the handler/parent—in most cases the mother—and the dogs physically followed this person whenever possible.

[National Service Dog trainer] will come ... [to integrate the service dog into the child's classroom] ... that will be cool, although it will be really weird for me, because, you know, [the dog] has been my little shadow here for three months now, four months by the time, and you know, I can't even go to the bathroom, [service dog] is following me to the bathroom ...

At nighttime, when the dogs were told to stay in the bedroom of the child with autism, further evidence of social bonding with the parent was indicated. After the doors were closed, many dogs whined and pawed at the door. Other indicators include the dog extravagantly greeting the parent after separation. This was especially evident when the parent went to pick up the dog and child from school or when the dog was let out of the child's bedroom in the morning.

... in the morning, because he sleeps in [my child]'s room, when I'd go to get him, he'd start jumping, like literally jumping up at me and you know, I'd walk in the door after being out for groceries or whatever and he'd be jumping. I kept thinking, what are you doing? And I couldn't get him to stop jumping and I didn't like it.

The dogs became very excited and, in some instances, attempted to move toward—or jump up on—the parent and began ignoring commands to stay put until approached by that parent.

Two households had a second dog in the family and had very different experiences. Dog 2 and the family dog completely ignored each other. In the other family, Dog 6 and the family dog socialized frequently and fought for dominance within the family. Dog 6 spent a considerable amount of time chasing the other dog, chewing on his ears, and wrestling with him. The dogs were separated at night, as the service dog was placed in the child's bedroom. The service dog did not settle very well; at 6 months, the parent was still trying to get the dog to settle at night, suggesting the dog preferred to be with other members of the family.

Despite the close proximity during the day while in jacket and at night in bed with the child, many of the service dogs did not receive any affection from the child, especially within the first 3 months of placement. Parents reported that their children did not always respond to the presence of the dog, thus making it difficult for the dog to receive attention from the child. The parents had to work hard to initiate contact between the dog and child and used methods such as assisting the child in giving the dog a treat, having the child feed the dog, helping the child to groom the dog, and helping the child to throw a ball for the dog. Each dog bonded and interacted differently with the child they were matched with, due to differences in the child's development and personality. So parents would be alerted if the child wakened or became agitated during the night. All but two of the service dogs were encouraged to sleep on the child's bed or in the child's bedroom. Depending on the activity level of the child during the night, some dogs would sleep on the child's bed; others left the child's room, once the child was asleep, to join the parents in another area of the house.

DISCUSSION

It is important to note that parts of this service-dog program—not included in this study—may affect the dog's welfare. This study only evaluates the service dogs' welfare as it applied at the time of their placement into these particular families. This study period does not include any observations or analysis of what the dog's welfare was like during the puppy-raising or advanced-training phase of the service-dog placement process. We recognize that these two important phases of the dogs' development have important implications on their ability to function and cope once they have been placed in their permanent home. Future studies should be extended to also include these important and influential phases of service-dog training.

Analysis of the interview data revealed a number of significant themes relevant to the roles these service dogs played in families with children with autism—with a focus on factors that ultimately affect the dogs' welfare and performance as service animals. Identification of potential physical stressors included lack of rest/recovery time after working, unintentional maltreatment and prodding from the

child, lack of predictability in daily routine, and insufficient recreational activities. The dogs formed social relationships primarily with the parent and second with the child. The implications of failure to meet the identified physical, emotional, and social needs as they relate to the dog's ability to perform his job and his welfare will be discussed later. Consideration of a service animal's health and welfare is an important ethical issue that must not be overlooked in animal-assisted therapy or service-dog placements (Heimlich, 2001). The identified needs and factors influencing behavior constitute a fundamental component of a service dog's welfare. These physical, emotional, and social needs are generally interpreted as requirements for normal function; basic needs must be satisfied for an animal to maintain a state of physical and psychological homeostasis (Clark, Rager, & Caplin, 1997; McMillan, 2002).

Role of the Service Dog

The role of these service dogs, despite the same initial training by National Service Dogs, appears to be varied once the dogs are placed. These dogs are exclusively trained to stop the child from bolting by serving as a tethered control mechanism and are also trained to stay calm and secure in chaotic situations. However, it was clear that many other secondary benefits emerged from the placement of these dogs in families of children with autism. Alerting the parent of dangerous situations (when a child is awakened during the night, is injured or unhappy), distracting and comforting the child, providing companionship, and staying by the child's side were extra benefits reported by the parents. Although these actions are not part of the dog's required daily duty, they are important factors in contributing to the dog's role within the family. Because each family had different expectations of the dog that sometimes extended beyond the dog's formal training, it is difficult to clearly define one standard description of this service-dog program. The use of dogs in working settings entails a different kind of management style and an intensity of effort different from that required for a house companion animal (Burghardt, 2003), especially given the circumstances surrounding the placement of these particular service dogs.

Physical and Emotional Needs

Physical needs are closely related to an animal's welfare. Examples of physical needs include water, nutritional input, and excretion of waste products. Examples of emotional needs identified in animals include social companionship, mental stimulation, controllability, predictability, and skills for coping with stress and challenges (McMillan, 2002). Factors such as pleasurable and positive

experiences, physical health, anxiety, and fear are also thought to influence welfare (Fraser & Duncan, 1998). These service dogs face periods of “instability” or change in their surroundings and ownership, disruption of their routines, and establishment of new routines—some of which appear to be potentially stressful. The dog must work in changing environments with children characterized by loud vocalizations, unpredictable movements, and changing emotional status while looking to the parent for direction and maintaining vigilance over the child.

To avoid physical stress, autism-service dogs need to predict the outcome of the child’s behaviors, avoid any potential abuse, and follow the training standards. The dogs must not retaliate or show any form of aggression. By successfully interpreting the child’s behavior, dogs are able to keep at a safe distance during more volatile situations. However, the result of these situations reduces the dog’s motivation to interact with the child with autism. Ideally, the dogs need positive reinforcement to interact with the children when they are calm and also need to know that it is acceptable to move away from a child if the child becomes angry or aggressive. An animal’s behavior can provide insight into his mental state and the extent to which her nature is satisfied (Wojciechowska & Hewson, 2005). Providing dogs with this perception of control lessens the intensity of unpleasant feelings or situations, such as fear, pain, frustration, or boredom (McMillan, 2002). Forcing the service dog to stay near an aggressive child could seriously affect the dog’s interest in wearing the service jacket and being attached to the child.

Failure to recognize why a dog was urinating or defecating in the house had a significant impact on parent satisfaction. Although this may not seem to affect the dog’s performance, parents’ dissatisfaction threatens the dog’s long-term placement in the family. Simple, unwanted behaviors could have been avoided by identifying and reducing sources of stress; providing consistent opportunities for dogs to defecate and urinate; providing adequate recreation and activities out of jacket; and minimizing the number of changes to daily routines.

Parents with previous dog experience (participants who had previously owned a dog) reported problems such as service dogs urinating in the home, but they were able to respond effectively to the behavior and understand possible causal factors associated with unwanted behaviors. An important implication of these service-dog placements is recognizing that each parent has a different level of tolerance for unwanted behaviors (Sanders, 2004). What may be a minor behavioral issue in one family could be a major issue in another, thus ultimately affecting their satisfaction with the dog and their decision to return the dog to the training facility. In addition, it is important to consider that much of what is regarded as “misbehavior” or a “behavior problem” may be entirely normal and natural canine behavior or a behavior resulting from poor human training or response. The first step is acknowledging that the service dog, like nonservice dogs, would be expected to show many normal canine behaviors and that even the best trained animals have

the potential for behavioral remission (Davis, Natrass, O'Brien, Patronek, & MacCollin, 2004). Further education for parents about normal canine behavior and husbandry would be a beneficial addition to the overall service-dog program.

In a few instances, the service dogs growled at the child with autism or at a stranger in public. Despite the physical demands and stressors inflicted on the dog by the child with autism, the dogs are highly tolerant of such behaviors but were sometimes anxious and fearful of attention received from an aggressive child. This anxiety may also arise from a loss of predictability in the environment, especially in social relationships (Reisner, 2002). These service dogs are carefully socialized and tested for aggression long before they are placed with the families. Dogs often respond with aggressive behaviors to someone petting or hugging them for prolonged periods, touching or manipulating parts of their body, removing an item from them, pulling them away—and uncertainty over the outcome of encounters and underlying fear and anxiety (Mertens, 2002). Fear-related, aggressive behavior can be directed to humans if the dog feels threatened by a person: for example, when children are playing or moving erratically. However, these service dogs have been carefully socialized, temperament tested, and trained to tolerate these stimuli. Regardless of the dog's training, it is essential that parents of children with autism carefully observe interactions between their service dog and their child to minimize risks of aggression.

Social Interactions

Assistance dogs are highly socialized animals who require adequate care, social companionship, and affection. It was apparent in this study, as reported by the parents, that the level of bonding with the autism-service dog was not as strong, and did not occur as quickly, as more traditional assistance-dog placements (Davis et al., 2004). It is likely that social environment plays an important role in forming, and maintaining, a dog's ability to attend to communicative and social signals (Pongracz, 2004). Within their environment, these service dogs receive many mixed social signals, especially from the child with autism. This particular service-dog application is unique in that the dog is expected to bond with both the primary handler (usually one parent), and the child with autism but expected to ignore other family members and the public when in jacket. The dog, although attached to the child, must take commands from the parent. The service-dog guidelines dictate that other siblings or relatives in the family should ignore the dog to facilitate the dog bonding to the child. However, children with autism sometimes have difficulty showing affection. Within the first 6 months of the placement, only 4 of the 10 children showed any interest in the dog, as reported through petting or initiating attention from the dog. If the parents also try

to limit the amount of attention they give the dog, potential exists for the dog to seek attention from other people in public, thus jeopardizing the dog's training. Careful attention must be given by the parents of these children to ensure that the quality and quantity of the petting or interaction behaviors are appropriate for meeting the dog's social needs. The strong effect associated with social relationships has the potential to substantially influence quality of life (McMillan, 2000). In addition to stress associated with social deprivation, McMillan (2005) discusses rejection of social contact as a form of emotional maltreatment with significant impacts on canine welfare.

Animal-assisted therapy studies are often criticized for anecdotal results that do not account for changes in the animal's response to the environment over time. This study provides descriptive and important information regarding service-dog behavior as it occurred over a period of 6 months to 1 year. It is acknowledged by National Service Dogs and by the parents who participated that the dogs require time to settle in their homes, and perhaps the first year of placement is not representative of the next 5 to 7 years of service work the dog will provide. However, dogs are expected to immediately perform, assisting the parents to protect the child's safety. Failure to evaluate or understand the factors that influence the dog's ability to provide this service within the crucial first year of placement has the potential to impact the dog's welfare and performance over time, in addition to putting the child at risk. Future studies should follow the dogs for a longer period of time, now that the specific factors early in the placement have been identified.

Overall Welfare and Implications

For the majority of these dogs, their welfare was adequate, based on current definitions and observational analysis of their behavior and actions in these homes. However, some gaps were identified, such as opportunities for social play and rest. The human benefit associated with this type of service dog is substantial (Burrows, 2005); hence, potential exists in these service-dog applications for canine welfare to be overshadowed by the needs of the family. The welfare concerns that were identified in this study arose in the absence of intent to harm, and there is scope for improvement by ensuring that parents are adequately educated and supported through the placement period. Service-dog training programs are costly, and addressing the needs of these dogs is likely to facilitate successful, sustainable placements with long-term benefits to children with autism and their families. Veterinarians and animal-behavior and welfare specialists may be useful additions to the advisory team. They can assist service-dog programs with effective follow-up: tracking how these dogs are doing in their

homes, monitoring their welfare, and responding to questions by parents about behavioral issues.

CONCLUSION

This research is a smaller component of a larger project evaluating the value of service dogs for children with autism and their families; as such, it is the first study to examine the impact of service work with these children on the welfare and performance of service dogs.

Service dogs have a unique upbringing, characterized by a number of different periods of instability and change. With placement for children with autism, a number of physical, social, and environmental factors influence the dog's behavior and, therefore, the ability to be a working dog who can successfully complete the job. At the most basic level, the service dog is trained to physically stop the child from bolting into the street or away from the parents in public. It was evident that the details of each dog's role differed between families. Roles were based on the child's characteristics, previous dog ownership experience, and the parent's initial reasons for applying for the service dog. Despite the same background training, each dog was expected to provide secondary services ranging from alerting the parent if the child was anxious, being a source of security and comfort, sleeping with the child, and accompanying the child to school. Given the diverse range of expectations of these particular service dogs, special care must be taken to evaluate the welfare of each dog in the home environment to ensure that the dog is capable of meeting these expectations in a way that does not negatively affect the dog's quality of life.

A number of key physical factors affected the dogs' behavior and welfare. These included factors causing physical stress, maintaining the dogs' health, and ensuring appropriate rest-recovery time and recreational activities. Lack of relief time for urinating or defecating, being in the jacket for long periods of time, and unprovoked negative attention from the child with autism were the most commonly observed—and reported—sources of physical stress. These service dogs receive many mixed social signals from the child with autism. This is further complicated by the dogs having to respond to commands from the parents while expected to bond to the children. The parents or handlers of these dogs must ensure that the quality and quantity of the petting or interaction behaviors are appropriate for the dog's social needs to be met.

Instead of focusing solely on the human benefits of these interactions, animal-assisted therapy and service-dog studies need to acknowledge the impact of this kind of work on the dog. As the use of service dogs and therapy animals continues to expand outside traditional uses such as guide-dog applications, it becomes even more necessary to assess and understand the factors that influence the dog's welfare in his role as a companion and working animal.

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