General Article

DOGS IN ANIMAL SHELTERS:
Problems, Suggestions, and
Needed Expertise

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Because of very real practical constraints, conditions in animal shelters are often reminiscent of those in early primate deprivation studies. Dogs are frequently surrendered to shelters because of behavior problems, and aspects of the shelter environment may induce anomalous behavior, increasing the chances that adopted dogs will be returned to the shelters. Comparative psychologists, psychobiologists, and other behavioral scientists possess the knowledge and techniques to help shelters intervene in this cycle. Experience suggests human interaction and the application of basic conditioning procedures can reduce the impact of the shelter environment, and ease the transition into the adoptive home. A program developed to meet these goals is described. Shelters can provide opportunities both for the training of students in animal-related exercises and for limited applied research. Behavioral scientists stand in a unique position to help transform conditions in animal shelters to the benefit of all involved.

Approximately 15 million dogs are either turned out as strays or released to animal-welfare agencies by their owners in the United States each year (Moulton, Wright, & Rindy, 1991). These agencies, facing an endless influx of discarded pets, are able to place only a small percentage of homeless dogs (Moulton et al., 1991). Moreover, during their stay in even a modern, well-run shelter, dogs are subject to a variety of psychological stressors, including novelty, isolation from any former attachment figures, exposure to unpredictable and often intense noise, disruption of familiar routines (such as walks for elimination), and a general loss of control over environmental contingencies. These are precisely the types of events known to activate stress-related physiological systems, particularly the hypothalamic-pituitary-adrenal (HPA) axis, in laboratory animals (Cooper, Goldman, & Levine, 1971, de Boer, van der Gugten, & Slan- gen, 1989, Friedman & Ader, 1967, Hanson, Larson, & Snowdon, 1976, Hennessy, 1997, Muir & Pfister, 1986). Sadly, for those dogs managing to beat the odds by finding a second home, such success is often short-lived. Dogs obtained from shelters and then relinquished make up about 20% of the population of dogs at shelters (Patronek, Glickman, Beck, McCabe, & Ecker, 1996, Salman et al., 1998). In short, despite the best efforts of caring shelter personnel, most dogs in shelters still face the prospect of spending some period of time in an environment beset by stressors, followed eventually by euthanasia.

BEHAVIOR PROBLEMS

Traditional educational and incentive programs promoting spaying and neutering to mechanically reduce the number of unwanted pets are essential offerings of animal-welfare agencies. Yet, no matter how successful these programs are, they focus on only one facet of the problem. Addressing a principal factor contributing to the surrender of the dog—the inability of the original owner to manage its behavior—is beyond the resources of most shelters. The behavioral complaints presented, including unruly or excitable behavior toward people, house soiling, and reactions to separation (Patronek, 1996), are not identified and are left uncorrected, and simply passed along to a new owner.

Moreover, from the vantage point of experimental psychology, another issue is more insidious. The very features inherent in the shelter experience might be expected themselves to disrupt the behavior of a dog. In other words, if a dog does not arrive at the shelter with a behavior problem, it may well acquire one. In the young macaque monkey, for example, prolonged social separation or isolation, particularly when combined with restricted housing, has numerous and often devastating behavioral consequences (Mineka & Suomi, 1978, Ruppenthal, Arling, Harlow, Sackett, & Suomi, 1976). Among the effects that have been reported are abnormal social behavior, enhanced or anomalous reactions in threatening situations, and retarded development of independence (Lichstein & Sackett, 1971, Mason, 1961, Mitchell, Harlow, Griffin, & Moller, 1967, Sackett, 1967, Suomi, Mineka, & Delizio, 1983). Clear-

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ly, most of the primate deprivation literature is concerned with effects of severe social restriction during sensitive developmental periods. Although older macaques are more resistant, they too have been found to show behavioral effects of social deprivation (Suomi, 1982). Further, it should be kept in mind that behavioral anomalies need not be severe to render a pet's behavior unacceptable in many households. In the single experimental study of human abandonment and the dog, withdrawal of the primary attachment figure for 2 months beginning around 10 months of age, without any change in environment, promoted an exaggeration of individual temperamental patterns that persisted beyond reunion (Senay, 1966).

The primate literature also hints at means of treatment. Under certain conditions, interaction with social partners has been found to both ameliorate the impact of a stressor and reverse many of the behavioral consequences of deprivation (Novak, 1979, Novak & Harlow, 1975, Stanton, Patterson, & Levine, 1985, Suomi & Harlow, 1972). It is noteworthy that experimental studies indicate that for a dog in a novel or threatening situation, the presence of a human companion may be more effective than the presence of a canine companion in reducing behavioral and physiological signs of stress (Pettit-John, Wong, Ebert, & Scott, 1977, Tuber, Hennessy, Sanders, & Miller, 1996).

Clinical experience with the dog (e.g., Tuber, Hothersall, & Peters, 1982) suggests effects of separation that parallel those seen in macaque monkeys. Following adoption, an abnormal dependency on the new owner may be evidenced in unrelated shadowing or following behavior when the owner is present, and is often correlated with destructive reactions that appear whenever the animal is left alone. The reaction to separation is a common theme that plays throughout case histories of previously surrendered dogs presented for behavioral treatment, and has been observed to be more common in dogs obtained from shelters than in dogs from other sources (Voth, Goodloe, Chapman, & Marder, 1993). Of course, this reaction can, and often does, appear in dogs never surrendered to a shelter, but even in this population the problem frequently emerges following disruptions in contact with the owner (e.g., kenneling during vacations).

Is there experimental evidence that housing in a shelter is, in fact, stressful? Recently, we found that plasma levels of the stress-related adrenal hormone cortisol were elevated in dogs sampled during one of their first 3 days in a modern public shelter (Fig 1a, Hennessy, Davis, Williams, Mellott, & Douglas, 1997). These heightened levels were not simply due to differences in the populations of dogs maintained in the shelter for differing numbers of days because dogs sampled on two occasions showed a decline from Day 1 to Day 4/5 (Fig 1b). The cortisol levels of newly arrived dogs were almost 3 times those of pet dogs sampled in the owners' homes (Fig 1c). Moreover, 20 min of human interaction—primarily slow, firm stroking of the dog—prevented a further cortisol increase in response to a venipuncture procedure (Fig 2, Hennessy et al., 1997, Hennessy, Williams, Miller, Douglas, & Voth, 1998). Physiological data, therefore, support not only the observation that shelters are stressful, but also the conclusion that even a single episode of interaction with a previously unfamiliar person can have an ameliorating influence.

For humans, mounting evidence suggests that psychologically traumatic events produce long-term changes in the activity or responsiveness of central neurochemical systems (e.g., corticotropin-releasing factor, norepinephrine) associated with stress, and that these changes can underlie the development of anxiety disorders and depression (Coplan et al., 1996, Gold, Goodwin, & Chrousos, 1988, Schulkin, McEwen, & Gold, 1994). Much current thinking focuses on the possibility that
BEHAVIORAL INTERVENTION PROCEDURES

History

In 1977, the first author and his associates began working with shelters in Ohio to incorporate a behavioral program and orientation into their ongoing operations. Many approaches and techniques were implemented through a process of trial and error as the program gradually evolved. We describe here the features that have been most successful and the details of implementation. This account takes the form of a general guide for setting up such a program in other shelters. It should be emphasized that each procedure we describe has been incorporated in our past work, although we make no claim that the program described is the only way to proceed. Indeed, we hope this article stimulates others to contribute to the process of developing effective and efficient techniques.

There are several goals of the program vis-à-vis the operations of the shelter. Provide a continuity of social contact and relief from stress while the dog is sheltered, prepare the pet for transition to a new home, identify and correct potential behavioral vulnerabilities, and help the shelter in marketing dogs for adoption. This program focuses on interaction between dogs and humans. Although primate studies have shown the value of conspecific interaction in reversing effects of social deprivation and moderating stress (e.g., Suomi & Harlow, 1972), and group housing has been employed in some shelters (Mertens & Unshelm, 1996), concerns regarding aggression and the spread of disease are likely to limit the applicability of programs focusing on conspecific interaction. Moreover, the plan advocated here is consonant with data showing a preferential effect of human interaction in moderating stress responses in dogs (Pettijohn et al., 1977, Tuber et al., 1996).

The Supportive Environment

Studies indicate that behavior problems are one of the most common reasons— if not the most common reason—for relinquishing dogs to shelters (Miller, Staats, Partlo, & Rada, 1996, Patronek et al., 1996, Salman et al., 1998). The released animals bring with them a constellation of inappropriate behaviors, including unruly or hyperactive reactions toward people, destructiveness, excessive barking, and difficulties with elimination behaviors. These problems correspond to those seen in clinical animal behavior practice. Moreover, as discussed earlier, negative consequences of confinement are likely to be evident in the dogs' behavior beyond the time of subsequent adoption. For these reasons, providing training and opportunities for socialization and minimizing the aversive impact of the shelter are essential elements of the program.

A core feature of our behavioral intervention program has been the "living room"—a designated area of the shelter that is decorated and furnished to simulate features of the home environment. It is to this room that the animal is brought daily to escape the din and physical harshness of the kennel, to main-
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tain a continuity of social contact under relatively calm circumstances, and to provide an opportunity for behavioral assessment and training to correct any obvious deficits. The dog is not only provided remedial work for identified problem behaviors, but also exposed to a general training routine to ensure that it develops basic skills designed to ease the transition to a new home. Each dog is trained to use the sit response. Initially, food rewards are used, but once the response is established, the treats are faded out so that all social contact and attention are made contingent upon sitting. Some variation of this technique is a widely recognized initial step in addressing a variety of canine behavioral problems (Campbell, 1995, Ryan, 1998, Tubber et al., 1982, Voth, 1980) In the context of the shelter, the structured nature of the training and the attractiveness of the treats provide an important vehicle for facilitating the socialization of the shy dog and for providing a foundation for establishing a semblance of control for the unruly or excitable one. The goal is to furnish the shy dog with a consistent, nonthreatening means for interacting with people and the unruly dog with an acceptable and structured means of soliciting contact. The contingent stimulation received by the dog in the living room (petting upon solicitation, treats and praise upon the execution of commands) provides the dog with at least a modicum of control over its environment, and appears to facilitate positive interaction with humans.

Figure 3 shows effects of contingent stimulation (tactile and verbal responses to social solicitations for 30 min/day for 14 days) received in a living-room environment in 6- to 9-week-old puppies (Miller, 1991). Control puppies received the same interaction, but it was not contingent on their behavior. The contingent stimulation increased the time puppies subsequently spent in quiet human contact in a modified Ainsworth Strange Situation Test. This effect was specific to quiet contact. The groups did not differ in amount of time spent biting and tugging at the persons. Contact with inanimate toys was, in fact, greater for the control group than for the puppies that received contingent interaction. Finally, during the test's first reunion episode, puppies in the contingent-stimulation group initiated contact with the familiar person more rapidly than did puppies in the control group. Thus, it appears that an acceptable way of gaining attention from the new owner can be shaped by the normal (contingent) nature of the social interaction that occurs between the dog and person in the living room.

Because stroking-handling has a well-documented ameliorating influence on the dog's physiological and behavioral reactions to stressors (Fuller, 1967, Hennessy et al., 1998, Lynch & McCarthy, 1967), each dog is rehearsed in a relaxation exercise: a ritualized massage of the neck and shoulder areas while the dog is in either a sit or side-down position. The massage is always associated with a cue word, such as "soft," to establish discriminative control (Tuber, 1986) Once the dog is trained, this exercise furnishes the basis for calming the dog if it becomes aroused in the kennel situation. This form of slow but firm petting appears to be most effective in moderating the

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![Fig. 3. Contact scores in modified Ainsworth Strange Situation Test for puppies that had previously received contingent human interaction in the "living room" and for control puppies that had received equivalent amounts of interaction, but in a noncontingent manner. The three panels show (a) the mean number of seconds in quiet contact with the familiar handler and a stranger, (b) the mean number of seconds in contact with toys, and (c) latency (in seconds) to initiate contact with the familiar handler during the first and second reunion episodes. *p < .05, †p = .06 Adapted from Miller (1991)](image)

cortisol response of sheltered dogs (Fig. 2, Hennessy et al., 1998).

During its time in the living room, the dog is trained to accept confinement in an airline crate or wire pen. The crate is a common tool among many dog owners and professional handlers. It mechanically prevents destructive activities, and with little more than sensitively graduated reward-based exposure to lengthening periods of confinement, the dog comes to appear comforted by the crate. The dog may also require further training to adapt to being left alone in the crate. Adaptation is essential (Borchelt, 1983), however, it is our experience that once this process is completed, dogs will rarely soil the crate or exhibit other stress-related behaviors commonly observed when they have free run during separation. The reason for the crate's effectiveness is unclear. Perhaps it relates to ancestors of modern dogs using enclosed spaces for protection, or maybe it is simply easier to train acceptable behavior in the smaller area.
Although conceptually dissonant with notions of free-running animals, the crate can counteract many problems facing the newly adopted pet and its owner during the disruption of transition to the new home. Moreover, although house soiling is a commonly cited problem for dogs surrendered to shelters (Miller et al., 1996), it is difficult to correct in the kennel situation.

Having established successful adaptation to the crate, the adopter has an effective tool for establishing good habits. In all adoptions, we recommend the use of a crate as a comfort area when the dog cannot be supervised. The owner is likely to view the initial adaptation and training as burdensome, however, beginning this task at the shelter removes a potential barrier or reluctance regarding the use of the crate. Another practical side of the crate is that the adopter may be unwilling to spend much time working with a new dog that routinely soils the house, chews the furniture, or misbehaves in other ways. If these problems can be prevented, especially during the period that the owner is building a bond with the dog, the chances the dog will be returned to the shelter likely will be diminished. Once acceptable behavior is established, the owner may wish to wean the dog from the crate, again with graduated exposures, but in this case to the interior of the dwelling while the owner is away.

Finally, it is probably prudent to re-emphasize the importance of fully adapting the dog to the crate. If a dog already manifesting behavioral problems during separation is simply confined to the crate during the owner's absence to prevent damage to the house, the problems will not be remedied, and the dog may injure itself (Voith & Borchelt, 1996).

Because of the inherent attraction of puppies, and the relative ease with which homes for puppies can be found, training puppies in the shelter is often overlooked in favor of training older dogs. However, the sit- and crate-training routines are no less important for puppies and can be accomplished with remarkable ease. At the very least, visits to the living room are valuable for play and petting. Breaks in socialization in the weeks following the waning of the primary socialization period (about 12 weeks of age) appear to have profound effects on later temperament (Pfaffenberger & Scott, 1976). Similarly, severe environmental restriction during the first several months of a puppy's life can produce extreme fearfulness during later exposures to novel surroundings (Fuller, 1967). This response was reversed with an hour of daily human interaction in an open area (Fuller & Clark, 1966). Although the degree of restriction imposed in this early work was more severe than a puppy would experience in a shelter, the potential implications of these findings (as well as of many of the results reported in the primate deprivation literature referenced earlier) for the adjustment of the adopted puppy are obvious.

Behavior as a Marketing Strategy for Shelters

Shelters can work to maintain a physical appearance that attracts potential adopters. Yet, apart from initial screening to filter out unhealthy or aggressive dogs, and perhaps some grooming and bathing, there is little about a dog itself, other than its behavior, that one can change to increase its adoptability. Little can be done about physical characteristics. Big black dogs cannot be made into cute blond cockers.

In addressing behavior, attention to the shelter's kennel area is important in several respects. This is a particularly harsh environment—marked by intense barking, exposure to strangers, and exciting situations—that keeps some animals aroused and accentuates withdrawal in others. Consequently, the initial days in the kennel should be counteracted by immediate attention. Treats are extremely useful as reinforcements, and, as quickly as possible, the sit command should be made the structured vehicle for interacting with the dog. Thus exercise is crucial for the animal aroused into stereotypic patterns of pacing, jumping at the cage gate, or barking. Following initial training, the dog is shaped to sit whenever its cage is approached. The withdrawn dog is addressed through contact with a handler in the cage as necessary to provide visible signs of comfort. Volunteers should maintain training with food treats on occasion, but always with the petting or close social contact these animals so clearly seek. If volunteers generally work in smocks, they should now sometimes appear in street clothes to simulate prospective adopters, and thereby generalize training to the display situation. Maintenance of behavior should be further ensured by instructing kennel staff to feed the dog, or to remove it for cleaning, walking, or other activities, only when it sits. With little practice, volunteers can easily shape longer sits, and can extend their control to a large number of animals simultaneously.

As a consequence of these actions, the general arousal and barking in the cage becomes reduced to a more acceptable level. The greatest effort is expended when introducing this procedure, once the pattern of training is established, it provides a strong framework within which new animals subsequently introduced into the kennel can be incorporated with considerably less effort. Perhaps the most apparent benefit of a quieter kennel is simply reduction of a potential stressor—noise—for kennel staff and as well as dogs. However, the institution of the sit command, and the behavior changes it promotes, also offers obvious marketing advantages for the shelter. Few people will adopt a pet that is exhibiting either hyperactive behavior or the withdrawn, asocial appearance of the frightened dog. The sit-at-approach response not only makes the duties of the kennel staff easier, but also makes the pet more adoptable by establishing more acceptable deportment.

In many shelters, areas are provided for introducing the pet and prospective adopter. This is an interaction that is critical in determining the potential adoptability of the animal. Yet often this aspect of the adoption process is completely overlooked. The dog taken from the cage and thrust into the greeting area may not behave well if it has not previously been adapted to the area. Routinely, the adoption greeting process, including the sit-for-attention response, should be simulated and practiced so that the dog becomes habituated to the area and the procedure.
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Finally, dogs that are judged unlikely to be adopted because of size or physical appearance can be singled out for special “trick” training. If the dog has been shaped to jump through hoops or to simulate playing a keyboard instrument (a simple extension of the “shake” command), a Polaroid photo showing the pet in action can be hung on the cage and will enhance its desirability as a pet.

Mechanics

As permitted by the availability of volunteers and other personnel, a systematic training program can be established. New volunteers can be readily instructed in how to teach the sit routines so that they are able to perform procedures required in the living room and furnish social contact and comfort in the kennel. Later, the volunteers can begin crate training. Records should be maintained and monitored by one volunteer leader who follows the progress of each dog so that problem areas can be identified. When specific problems with the training of individual animals arise, they can be handled by the more-practiced volunteers who have received specific advanced instruction. One group of individuals should be singled out to provide the trick training just described.

Trained personnel should be available to have the dog sit for attention in its cage for potential adopters. The personnel should also demonstrate the signals or commands used to train the sit, discuss the basics of crate training, and address the potential problems that the new owner will face. The owner should be briefed on the importance of having a structured, designated time for walks, play, and quiet socialization to alleviate the apparent randomness of events in the dog’s life during introduction to a new home. The owner should also be given the opportunity to practice the quiet massage, and directed in the benefits of training classes for refining control under distracting circumstances. Many shelters offer such training services. Continuity in training from shelter to home furnishes one means of blunting the impact of the transition to the new environment. It needs to be emphasized that handing out the information is simply not enough. At the time of adoption, the owner is faced by a multitude of handouts, adoption papers, training guides, and free supplies. Additional papers are likely to go unnoticed or to be disregarded, so hands-on instruction is essential.

What one can ultimately accomplish will necessarily depend on the level of volunteer involvement. At the simplest level, however, much can be done within the limitations that normally prevail at most shelters. It should also be noted that volunteers usually are not rare commodities at a shelter. Many shelters, particularly those that are privately run, already have some kind of volunteer program in place. Moreover, these volunteers are often in search of advice to handle many of the same problems discussed here.

In return for instituting a program like the one described here, shelters may benefit in other aspects of their operations.

For the 6 months preceding the initiation of our program at the Montgomery County Animal Shelter in Dayton, Ohio, compliance with the shelter’s spay and neuter program was 35% (123 of 347 intact adopted dogs). In contrast, for the 6 months beginning 6 months after the volunteer program was initiated, compliance jumped to 62% (228 of 369). There was no other obvious change at the shelter during this period that seemed likely to account for this improvement.

Maintaining the Relationship With the Owner

The relationship maintained between the new owner and shelter at the time of adoption is fragile, but given the high recidivism rate of adopted dogs, it is one worth maintaining. The shelter that offers classes for new owners in how to train their dogs has available one vehicle for continuing the contact. Participation in a training class is associated with a greatly diminished risk that a dog will subsequently be relinquished to a shelter (Patronek, 1996). Personnel qualified to advise owners regarding the basic problems that they will encounter—destructive behaviors, housebreaking, and the myriad of minor objectionable misdeeds committed by the normally curious dog—should be available to continue the owner’s education. In our experience, the training can be designed specifically for utilizing a few simple commands (sit, heel) to manage the pet in the home situation. For example, appropriate means for greeting family and strangers, or for entering and exiting doors, can be established with these commands, and then routinely practiced under simulated conditions to counteract the undesirable behaviors that can assail the sensibilities of any pet owner. Often a follow-up call—just to see how things are going—can be used to remind the new owner of the procedures he or she is encouraged to follow: the sit-for-everything command (to maintain acceptable soliciting behavior), the quiet massage, crate training, and adherence to regular routines. Questions or problems concerning the procedures can be addressed at this time.

The goal of the shelter of the future or progressive shelter of today must be more than to be a reasonable place to acquire a good pet. It is no less important that the shelter should be a resource when problems arise. For members of the community who are experiencing behavior problems with their dogs, or for people who are simply considering acquiring a pet, public workshops can be made available on a regular basis to provide some general information regarding pet behavior. A workshop can consist simply of a lecture on behavioral development and the origins of behavior problems, followed by a question-and-answer period. Shelters could come to symbolize a first resource, not just the final solution.

The Reciprocal Relationship Between the Behavioral Scientist and the Shelter

Basic research in such fields as animal behavior, conditioning, and developmental psychobiology provides a strong foun-
In sum, the message is clear. Adoption agencies, humane societies, and other shelters should not longer be content to merely serve the traditional function of warehousing unwanted pets. In doing so, they inadvertently contribute to the influx of animals to the shelters. The behavioral sciences are in a unique position to offer assistance to shelters in developing a supportive and positive environment, increasing the adoptability of pets, and maintaining adoptions. And although behavioral scientists have not exactly received favorable press from animal activist organizations for studies of social deprivation and the other basic research that has laid the groundwork for this effort, no professional element better understands the problem of the socially deprived and stressed animal, and the issues surrounding psychological adaptation and development.

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