



EDITORIAL

Considerations for shock and ‘training’ collars: Concerns from and for the working dog community

In the United States, the FBI periodically convenes scientific working groups (SWGs) to establish guidelines, standards, or best practices in fields or disciplines relevant to a law enforcement focus. Given the global events of the past few years it is appropriate that dogs are now a focus addressed by the Scientific Working Group on Dogs and Orthogonal Detector Guidelines (SWGDOG) (www.swgdog.org). As co-chair of this SWG my task has been to emphasize roles for canine behavioral genetics where appropriate in the development of the guidelines, and to chair the subcommittee on unification of terminology (SC1) and co-chair the research subcommittee (SC7). This group is as unique and diverse a congregation of people as I have ever encountered. In addition to scientists, membership includes those from national and international government and canine groups, law enforcement officers, trainers, handlers, and those involved in virtually all detection disciplines involving canines. All documents produced by this group are posted on the public website in a step-wise manner and available for public comment as the first pass of the topic is completed. This is a truly collaborative effort, and I encourage readers of this journal to visit the website and contribute when the potential to be helpful exists. More information on the mission and work product of SWGDOG will appear in *JVB: CAR* in the future, but I wanted to discuss an issue that arose as a result of my role as co-chair of this group.

Those of us who publish and speak frequently at colloquia or continuing education are often quoted or cited. In the absence of a context that is provided by being present when a talk is given or when a complete article is read, we often have statements or policies attributed to us that do not completely or accurately represent our views. I experienced this phenomenon recently as a result, in part, of publishing my editorial on shock (Overall, 2007). Because the issue is a common one I thought that we might be able to engender an expanded discussion on the facets that are part of this complex discussion.

The issue raised with me involved a post on a listserv for canine handlers that stated: “The co-chair of the committee is a behaviorist/vet, Karen Overall. She’s a sworn enemy of such devices as Ecollars, pinch collars and any other devices

that can cause pain to a dog.” There are multiple issues implied in this statement, and I shall go through them stepwise. I have included some references in this article, but the original list of references can be found in the editorial on shock. Here is how I explained my thought process to those on the listserv.

As an academician, I publish extensively, primarily in the peer-reviewed and textbook literature. This means my ‘views’ are a matter of public record, and that I based my arguments on results found in the published literature.

As a specialist in veterinary behavioral medicine and a researcher who focuses on the development and treatment of anxieties in dogs, behavioral genetics, and performance outcomes I am asked to evaluate and comment on a wide population of dogs. Although most of the dogs on whom I now focus are selected because of research interests (the genetics of aggressions, anxiety, and noise reactivity), many of these dogs are actually patients who come to me because of problematic behaviors. Additionally, I continue to see a subset of dogs who are not the focus of any behavioral investigation but who are troubled dogs with distressed humans. This means that one population for whom I evaluate tools are patients . . . problematic and distressed dogs.

Absolutely, without exception, I oppose, will not recommend, and generally spend large amounts of time telling people why I oppose the use of shock collars, prong collars, choke collars, and any other type of device that is rooted in an adversarial, confrontational interaction with the dog. Without exception, such devices will make my anxious patients worse and allow the anger level of my clients to reach levels that are not helpful and may be dangerous. The link between dog abuse and spousal/child abuse is now well-established (Ascione and Arkow, 1999; Lockwood and Ascione, 1998). I educate people about this and about breaking the cycle.

Simply put, when these adversarial methods are used on my patients they become more anxious, more pathologic, and potentially more aggressive and dangerous, depending on their problem. I am currently dealing with a poodle who is now biting the owner more—not less—often than before because the owner has begun to use a prong collar in her

obedience training classes. This is a woman who has shown dogs in obedience for years and thinks she is doing well because she has rejected the calls from her fellow trainers to use a shock collar.

The reason these devices make my patients worse are the same reasons that I would oppose their use—were I asked—for working dogs. They do not work the way people think they do, and there are better tools and understandings for accomplishing what people who use these seek to accomplish.

Such tools ‘work’ by engendering fear, pain, and distrust, and in doing so they cause long-term damage that make dogs more reactive, less trusting, and less able to reach their full potential in their partnership with humans, no matter what form that partnership takes. These are not my opinions; these are the findings from the scientific literature, and this is an essential point.

As a scientist I do not have the luxury of claiming that I am right because I have done something one way for years, nor do I have the ability to assert that a technique does not injure dogs when the evidence indicates otherwise. Science is about understanding patterns in how the world works and, as such, provides a methodology by which we can test claims and assertions. When these adversarial methods have been tested rigorously, they have been found wanting.

In the past decade, scientists have evaluated the effects of shock, sudden loud noises, the force exerted by tight neck collars versus harnesses, and numerous other control and treatment issues that are now falling under the growing domain of welfare issues in animals. The United States lags behind most European countries, Australia, and New Zealand, and, to a lesser extent, Canada in consideration of animal welfare issues, but these issues affect many working dogs and pertinent welfare information should be available and accessible to those handling working dogs.

Those who know me can have no doubt that one of my missions is to ensure that scientific articles and the information they contain pertaining to canine behavior and behavioral genetics are available to the working dog and dog fancier community. In fact, the citation and compilation of such sources is one of the missions of SC7 of SWGDOG and our database now contains greater than 900 research articles and chapters in scientific publications.

A brief review of 2 of the main points—roles for immobility and obedience and the effect of shock on molecular and cellular ‘learning’—from the original editorial is warranted here.

Roles for immobility and obedience

We have known for decades that shock works to teach avoidance and cessation of behavior, which in the extreme form often examined in the psychologic literature, is referred to as “immobility.” It is this criteria of ‘immobility’ by which learned helplessness is accessed (Seligman, 1971). No one who is recommending shock for treatment of be-

havioral problems has evaluated scientifically the extent to which they may be inducing learned helplessness. In none of the website sources supporting the use of shock that I read did any of the authors realize that cessation of one behavior did not mean that the dog was normal, or that he or she was rationally complying with a program designed to eliminate the reason for the behavior. In fact, it is often claimed that clients find that the dog becomes ‘obedient.’ Obedient dogs can be quite distressed, and suffer from profound anxiety while complying with a request.

We must ask ourselves 2 questions with respect to cessation of a behavior and the potential for subsequent immobility: (1) is immobility what we want and is cessation of one behavior about which a client has a complaint sufficient; and (2) what other behaviors or behavioral processes are being affected when one is exposed to shock?

Cessation is insufficient for 2 reasons.

First, if the behavior stops we must realize that a ‘stop’ here is only a halt in the process or signal and that the dog must then be directed toward and rewarded for an appropriate behavior if we wish for him to be able to make such a decision himself as a result of learning.

Second, and more important, the canine behavior for which the animal is receiving a shock is not analogous to the level-pressing behaviors so often cited in the rodent literature for which shock has been used as an assay for ‘motivation.’ The behaviors for which people wish to use shock in dogs are those that annoy humans. These behaviors are either signals or non-specific signs of underlying distress. It is clear from the above example that such distress is neither considered nor addressed.

Effect of shock on molecular and cellular ‘learning’

If shock and pain are profound, it is possible to induce almost immediate long-term potentiation (LTP), the molecular changes associated with hippocampal memory that will lead to a strong aversion or phobia. The hippocampus is the primary region where fears and anxieties associated with fearful stimuli are thought to originate, so a logical sequela to a stressful, painful stimulus may be fear, phobia, or withdrawal. At the cellular level any kind of repeated reinforcement ensures better, more numerous and more efficient connections between neurons. When stimulation continues, we know that activity dependent plasticity at synapses (e.g., learning) occurs in the lateral amygdala. This is one modality postulated to be involved in learning of contextual fear (Schafe et al., 2001).

We may also be changing other behaviors or processes when we expose an animal to shock (Beerd, 1997).

In a landmark study published in 2004, Schilder and van der Borg (2004) showed, using guard dog training of German shepherd dogs, that there were untoward, negative, long-term effects of training with shock. Dogs that were shocked in training, but not when the evaluations were

made, showed a lower ear posture in free-walking, and more stress-related behaviors than did dogs who had not been shocked in training. These differences were also found when these dogs participated in obedience training and manwork. In addition to the noted behavioral responses associated with stress and distress found in dogs that had been trained with shock, the researchers also found physiologic differences in the HPA axis that were most profound when the person associated with the shock (the owner or handler) was present. Their conclusions were that: (1) this type of training, in general, is stressful; (2) receiving shocks is painful for the dogs; and (3) dogs learn a context-dependent concern: the presence of the owner/handler and his or her commands announces the reception of shocks. This is still the most rigorous study on the responses of dogs to shock, to date, and it shows that, although shocked dogs can excel as guard dogs, their behaviors toward humans and work circumstances changed, often indicating heightened uncertainty and reactivity. We need to ask ourselves if this is the response we truly desire or if we could do better.

Even if the response to a shock in a training situation is to 'stop,' a response, it in no way represents what the dog will do in real-world situation. I am sure that most readers of this post are familiar with the YouTube video of the French police dogs, one of whom bites the handler when the handler tries to stop him from going further (the dog is wearing a shock collar) and ONLY responds to the handler when the handler punches the dog in the face. Simply, the dog is cognitively and physiologically past any response to shock except to become more aroused by it. To rely on shock to stop a dog in a real-world situation is neither safe nor rational, based on what we know from the literature of aroused states and physical violence. Any officer who has responded to a domestic violence call knows what force or pain will do to the situation. The same logic applies to dogs. The president of one of the larger, regional detection dog groups in the United States told me that he believed that any handler who hits the streets with a dog wearing a shock collar did not have a well-trained or reliably trained dog. The handler, unfortunately, does not understand how much he or she contributes to the dog's unreliability. In short, we need the best partners available for K9 officers and the data indicate that shock interferes with achieving this goal.

There are also serious physical and medical concerns for using choke or prong collars on dogs. For years there have been data implicating these tools in cervical (neck) instability and degenerative arthritis in dogs and in recurrent laryngeal nerve paralysis, which can affect voice, swallowing ability, etc. Such concerns are not rare in working dogs. We now have data (Pauli et al., 2006) showing that the effects of neck pressure by collars increases intraocular pressure—the pressure in the eyes of dogs—in a manner that is injurious to the vision of many dogs over the long term, and in the short-term in a way that puts dogs with thin corneas, glaucoma, eye injuries including corneal lacer-

ations, etc. at serious risk, especially during exercise or activity. It should be noted that German shepherds have a relatively high incidence of some of these eye conditions. None of these effects were found when the dogs wore a harness. The pressure changes noted in the eye were the result of increased pressure on the jugular vein and all veins to the head and eyes. Furthermore, the effects were more profound with age, meaning the effect was larger for older dogs.

The final issue I wish to address is the one that says you should use aversive stimuli to teach dogs appropriate avoidance. There are 2 parts to this issue: timing and learning theory, and practical tests.

I have observed dogs on whom shock is being used to stop the dog from pursuing the wrong target. For this to have any chance of working one basic tenet of learning theory MUST be complied with: dogs learn by association if the stimulus is delivered within the first few seconds of the behavior or its onset. This means that by the time the dog is off-course, the onset of that behavior in the dog's mind may have been minutes ago. It is no surprise that when shocked, many of these dogs just stand there and yelp. Simply, the timing was wrong, the stimulus was greater than it needed to be just to teach 'no,' no alternative was offered, and the dog learned something unintended. Many, many working dogs have been shocked, but they may work as well as they do, despite this finding, not because of it. That statement should allow us to raise the question of whether they would have worked even better were other methods used.

'Aversion therapy' has been used to teach dogs to 'avoid' classes of individuals like snakes, in regions of the world where there are poisonous snakes, and stock, in parts of the world where people are concerned that dogs will worry or kill stock. There are no scientific studies on whether shock teaches dogs to avoid snakes, in part, because the population data on the range of 'normal' canine responses to snakes are lacking completely.

There are, however, some population level data for the shock and stock issue, within a restricted set of circumstances. Mort Bakken and colleagues in Norway have looked at using electric shock to prevent dogs who might do so from worrying/attacking sheep (Christiansen et al., 2001a,b). In the Norwegian summer approximately 2.2 million sheep and 80,000 goats graze freely. In one county in Norway, 66 sheep were killed by dogs between 1991 and 1998 (<10 sheep/year for this county). This study, conducted over 2 response years, was designed to measure the effects of electric shock on behaviors thought to be associated with sheep attacks. It has some interesting implications, not all of which are noted by the authors. First, these are contrived experimental situations and there were no actual quantitative or qualitative data on the dogs' behaviors before the experimental test. Second, to receive the 1-second, 3,000 V, 0.4 Amp electric shock (manufacturer specifications, no validation data),

the dogs had to exhibit a specific set of behaviors when in the presence of sheep. In the first year of the study 87.7% of the 138 hunting dogs chosen for study received no shocks because they did not exhibit the needed behaviors (!). There were individual and breed differences in response to sheep and these differences in the way or rate the dogs withdrew from sheep was not independent of behavioral patterns exhibited in the presence of other dogs and humans reported previously. Third, younger dogs (<3 years) exhibited more interest in sheep and chasing of them, suggesting that social development was occurring and an understanding of developmental stage-associated specific behavioral suites may have been helpful in understanding how many behaviors labeled as associated with sheep attacks actually reflected such behaviors. Fourth, there were some interesting behaviors noted in the second year of the study when shocked versus unshocked dogs were compared. Interest in sheep decreased between years regardless of group, although reactivity (measured by latency to respond and discovery distance) increased in shocked dogs. In the end, one dog who was persistent with sheep the first year and was shocked for it consistently, still attacked sheep in the second year. This is important because it hints at variance in rewards. One interpretation is that the cost of the shock was worth the reward gained by ignoring it. Fifth, shocked dogs displayed various reactions to shock, in addition to withdrawal, including head shaking, vocalization, and jumping. There were also changes in their behaviors toward humans suggesting increased vigilance pertained to humans. Fourteen dogs studied the second year who approached sheep and were shocked in this experimental context during the first year, did not do so or receive shocks the second year. However, these dogs exhibited different behaviors than did the unshocked group, most of which are only hinted at here, but suggest a response to distress. Given the behavioral patterns discussed in this article, and the overall incidence of the problem, one is left wondering whether an aversion training system that alters normal behaviors for the worse is worth risking given that truly dedicated animals don't necessarily show the desired response. In the absence of a comparable, but non-antagonist method (e.g., a control) to discourage such behaviors, we have to acknowledge that the data are incomplete.

A more recent study comparing the response of goldfish and trout to shock intended to teach avoidance (Dunlop et al., 2006) shows why our investigation of specific behavioral responses to shock should be careful, complete, and nuanced. In short, social patterns between species affected responses: trout, a social species, would withstand the highest level of shock (30 V) administered in the experiment if their conspecifics were on the other side of the shock. Otherwise, they learned to avoid 3 V shocks. For goldfish, the presence of conspecifics did not have the same effect. No fish were unchanged by the

shock when before and after behaviors and physiology were examined. Cortisol indicated the presence of a stress response even when a 'mild' shock was applied, and the development of behaviors indicative of fear were noted.

Given what I do for a living, my focus is always going to be the dogs. That said, whether or not anyone understands or accepts what I have written here, there is one aspect, not yet discussed, that must be considered. A blind reliance on these methods is preventing handlers and trainers from having the partnership with science and scientists that would benefit both of them.

We are in a time period where canine cognition is the focus of much important research, often with surprising results (Hare et al., 2002; Kaminski et al., 2004). An unquestioning commitment to old methods is going to hurt the canine-handler team. Regardless of how I feel about these methods, I think the people and dogs who work so hard to make the world a safer place are heroic. They deserve the best methods and data available to help them do their jobs. A large part of my research is committed exactly to this effort. Putting to use the knowledge we have regarding canine cognition and learning depends on doing something that was antithetical years ago: working with the dog as a cognitive, reasoning individual in a partnership based on the best use of everyone's skill sets. This is a heck of a lot harder than treating dogs simply as another tool that cannot reason. The historic use of adversarial, coercive techniques no longer makes sense given what we now know about dog cognition and learning.

We can do better. The canine handler teams that work best are those that best understand and trust each other. Anything that interferes with that trust and understanding is hurting the team. When I work with individuals or groups who use dogs in work I spend 90% of my time just translating for the dog.

There are alternatives to aversive devices. I recently watched a Schutzhund dog work just as well on a Scruffy-Guider (Misty Pines Dog Park, Sewickley, PA) as he did on a choke collar, but he breathed better. I have seen military dogs learn almost instantly using head collars (Gentle Leader; Premier Pet Products, Midlothian, VA) because the target of their focus was clear. And I have seen my own dog, Flash, recover from being hung from a choke chain until he passed out, after which time he put the trainer in intensive care. That is how he became my dog. . .he was my patient first. Some people reading this may have met him, and so know what an amazing dog he is. Flash is the individual who first opened my eyes to learning to think in a different way simply because any forceful interaction with him would have resulted in injury to those exhibiting the force. No exceptions. His lessons have benefited many.

Finally, SWGDOG is committed to using science to make canine teams more effective, and to ensure that the data from such teams meets standards that will allow those

data to be upheld in court and other related situations. I am co-chair of this group, along with another academician, a chemist, Dr. Ken Furton, Florida International University, because canine behavior and genetics and analytical chemistry are both growing fields and at the cornerstone of what detector dog teams do. When we created SWGDOG we all realized that this was a chance for the operational and scientific community to talk and work together, and I remain committed to this effort. We live in a time when we simply have no other choice.

I think that the same collaborative sentiment must hold true for all of us who work with animals. We have run out of time to hide behind our own myths and in ivory towers. If not us, who; if not now, when?

Karen L. Overall
Philadelphia, PA

References

- Ascione, F.R., Arkow P., 1999. Child Abuse, Domestic Violence, and Animal Abuse: Linking the Circles of Compassion for Prevention and Intervention. Purdue University Press, West Lafayette, IN. p. 479.
- Beerda, B., Schilder, M.B.H., van Hooff, J.A.R.A.M., de Vries, H.W., Mol J., 1997. Behavioural, saliva cortisol, and heart rate responses to different types of stimuli in dogs. *Appl. Anim. Behav. Sci.* 58, 365-381.
- Christiansen, F.O., Bakken, M., Braastad, B.O., 2001a. Behavioural differences between three breed groups of hunting dogs confronted with domestic sheep. *Appl. Anim. Behav. Sci.* 72, 115-119.
- Christiansen, F.O., Bakken, M., Braastad, B.O., 2001b. Behavioural changes and aversive conditioning in hunting dogs by the second year confrontation with domestic sheep. *Appl. Anim. Behav. Sci.* 72, 131-143.
- Dunlop, R., Millsopp, S., Laming, P., 2006. Avoidance learning in goldfish (*Carassius auratus*) and trout (*Oncorhynchus mykiss*) and implications for pain perception. *Appl. Anim. Behav. Sci.* 97, 255-271.
- Hare, B., Brown, M., Williamson, C., Tomasello, M., 2002. The domestication of social cognition in dogs. *Science* 298, 1634.
- Kaminski, J., Call, J., Fischer, J., 2004. Word learning in a domestic dog: Evidence for "fast mapping." *Science* 304, 1682-1683.
- Lockwood, R., Ascione, F.R., 1998. *Cruelty to Animals and Interpersonal Violence: Readings in Research and Application*. Purdue University Press, West Lafayette, IN. p. 452.
- Overall, K.L., 2007. Why electric shock is not behavior modification. *J. Vet. Behav.: Clin. Appl. Res.* 2, 1-4.
- Pauli, A.M., Bentley, E., Diehl, K.A., Miller, P.E., 2006. Effects of the application of neck pressure by a collar or harness on intraocular pressure in dogs. *J. Am. Anim. Hosp. Assoc.* 42, 207-211.
- Schafe, G.E., Nader, K., Blair, H.T., LeDoux, J.E., 2001. Memory consolidation of Pavlovian fear conditioning: A cellular and molecular perspective. *Trends Neurosci.* 24, 540-546.
- Schilder, M.B.H., van der Borg, J.A.M., 2004. Training dogs with the help of the shock collar: Short and long term behavioural effects. *Appl. Anim. Behav. Sci.* 85, 319-334.
- Seligman, M.E., 1971. Phobias and preparedness. *Behav. Ther.* 2, 307-320.