Response Cost in the Treatment of Lunging in Dogs

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RESPONSE COST IN THE TREATMENT OF LUNGING IN DOGS

by

Jennifer L. Sobie

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Psychology

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Jennifer L. Sobie
Contemporary professional applied animal behavior management employs a diagnostic and treatment approach for unwanted pet behavior that incorporates ethology-based causal factors. As in behavior therapy for humans, behavioral assessment includes descriptive functional analysis when possible to determine relevant contingency variables. But this information is then considered in the context of an appropriate motivational classification, such as social or prey-directed motivation or fear-motivated, and treatments are designed accordingly. A different view is that behavior can be treated effectively without a presumption of the motivation through analysis of the manifestation of the behavior itself. This study sought to evaluate the efficacy of an intervention designed without consideration of behavioral classification to reduce the frequency and duration of on-leash lunging in dogs. The intervention utilized a combination of response-cost, negative reinforcement of an incompatible behavior (DRI), and positive reinforcement of other behavior (DRO). Results of the study showed that the intervention produced at least some decrease in both the frequency and duration of evoked lunging in 8 of 9 subjects tested, indicating that motivational classification may not always be a necessary component of treatment of behavior problems in dogs.
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CHAPTER I

INTRODUCTION

Dog training has been around from the time that man first found that befriending a wolf was safer than tossing sticks at it. Dogs have functioned as both servant and companion to man over the ensuing expanse of years, and dog training concepts and theories have varied greatly to reflect both of these perspectives. In relatively recent years dog training has gained popularity as a competitive sport, and as the interest in training has grown so indeed have the theories and techniques. With the advent of the internet and on-line newsletters, personal opinion and experience-influenced advice on just about any aspect of dog training imaginable is available for those with the time and the fingertips to pursue it. Trainers can be found that argue with passion the merits of techniques that advocate the use of electronic stimulation in teaching as well as eliminating behaviors, and trainers can be found in equal number to argue with equal passion that the only truly effective training methodology is one that relies solely on positive reinforcement. Many of the techniques, each apparently successful in its own right, actually seem to contradict one another. What is the thread that runs germane throughout these techniques to account for their purported success? The answer of course lies in manipulation of behavioral principles (Sobie, 1998). Behavior that has changed is behavior that has been subject to contingency
manipulation, and this manipulation needn’t be restricted to some philosophically or methodologically based approach.

When we consider how long dogs have been an integral part of our society and how many people are involved either professionally or personally or both in dog training, it is surprising how little we really know about the actual comparative efficacy of different training techniques and methodologies. Perhaps the problem is the same one that often plagues clinical psychology – the method necessary for research follows a protocol ineffective and occasionally even unethical for therapy (Vollmer & Smith, 1996). Whatever the reason or reasons, coupled with an equally real lack of scientific observational studies of domestic dog behavior, the upshot is both a dearth of scientifically validated training data and a mountain of anecdotally based opinion purported and reported as fact.

The problem with this of course is that efficacy counts. As prevalent as dog owners and dog lovers are, an increasingly large segment of the population perceives the dog as a dirty and dangerous animal with few redeeming qualities (Serpell, 1995). Increasingly pervasive are legal bans and insurance clauses negating policy return when the family owns Fido and Fido happens to be of a certain breed. Given such a predisposition, pet management is faced with a need to address itself in a concerted effort to an evaluation through scientific method of the efficacy of training interventions designed to treat unruly behavior in pet dogs. Accordingly, the veterinary medicine community has begun to apply its diagnostic and treatment
services to the management of pet behavior, addressing behavior problems in both clinical practice and in the literature.

Applied animal behavior management has undergone an extensive change in the past decade. Where behavior problems in dogs were once the domain of dog trainers empowered by a wealth of home-grown experience but a paucity of scientific method-based knowledge, the past decade has seen such problems move out of the backyard and into the treatment rooms of veterinary medicine. Under the umbrella of veterinary medicine, the animal behavior consultant was born. The extensive data complied through the experimental analysis of behavior and the advent of animal research brought with it guidelines for behavior change and offered the academic animal management community tools with which to address problems once considered untreatable. Coupled with this embrace of behavioral principles however was an equally strong reliance on ethological observation data. Together these perspectives tend to foster an interpretation of behavior from a motivational context and to influence design of diagnoses and resultant treatments accordingly. While data supporting successes in treatment in general have been collected, this methodology has not been validated.

Dogs that lunge and vocalize and break loose from their owners when encountering other dogs while on walks are an embarrassment for their owners and a public nuisance. Often, this behavior presents itself as resistant to intervention. The treatment evaluated in this study is an intervention to reduce on-lead lunging. This treatment is based on manipulation of the variables manifested in execution of the
behavior itself, and represents an approach to evaluation and treatment of dog behavior problems that is unique from the methodology commonly used by both dog trainers and animal behavior counselors. The results will therefore be discussed in terms of both treatment effectiveness and implications for future diagnosis and treatment of problem dog behavior.

Animal Behavior Counseling

Behavior Happens: On-Lead Lunging

On-lead lunging often presents a paradoxical problem for owners seeking training intervention. Taken to an obedience class, they will encounter other dogs that may evoke and exacerbate the problem. Dogs that present in a group-setting obedience class with rowdy lunging behavior are disruptive and sometimes dangerous to other members of the class, and their owners are often asked to either leave the dog home and simply listen to instruction, or to drop the class all together. Though not uncommon, these scenarios provide the owner with little hope of mediation of the problem.

To make matters worse, the owners are often made to feel responsible for their dog’s aberrant behavior. Particularly if that behavior includes vocalization and other boisterous responses in the presence of other dogs who are not themselves emitting such responses, the owner’s physical ability or strength of personality or lack thereof or some other contrived attribute or failing is labeled as sufficient reason for the dog’s
problems. Statements such as "on-leash aggression for normally social dogs is a failure on the owner's part to teach their dog how to greet other dogs on leash" (Canine University, 2002) place blame for the dog's behavior squarely on the shoulders of the owner. While an inadvertent history of reinforcement of undesired behaviors can have an influence on a dog's responding in certain environments, pet dog behavior should not be considered a product somehow of the owner (Overall, 1997). In reality the problem is the dog's, the problem does not reflect normal behavior, and an essential maintaining factor is the lack of an effective treatment.

Behavior Counseling and Behavioral Classification

There are four recognized associations for certification of North American pet behavior counselors. These certifying organizations are the American College of Veterinary Behaviorists (ACVB), offering official certification for veterinary behavioral specialists, the Animal Behavior Society (ABS), which presents itself as the leading professional organization in North America for the study of animal behavior (2002), the Association of Companion Animal Behavior Counselors (ACABC), and the Association of Pet Behaviour Counsellors (APBC). The Association of Pet Behaviour Counsellors offers certification through the Association for the Study of Animal Behaviour (ASAB) with an accreditation committee consisting of members of the British Psychological Society, the Royal College of Veterinary Surgeons and the International Society for Applied Ethology (2003). Reflecting the relatively short existence of the field of pet behavior counseling, none of these certification programs existed before 1990. For all four of the programs,
certification as a pet or animal behavior counselor includes requirements of accredited training in ethology or biopsychology as well as experimental psychology. Additional requirements include course completion in animal nutrition and wellness, and animal welfare science. All of the programs have experience and intern requirements that must be fulfilled exclusively under the supervision of members of their respective organizations. The ASAB's experience requirement has an additional stipulation that all behavior problem cases considered for evaluation be engaged only on referral from veterinary surgeons (unless the applicant is a veterinarian).

Diagnostic protocol in animal behavior counseling relies in part on similar strategies as clinical behavior therapy with a focus on behavior, i.e., the dog behavior counselor does not ask, "Does this dog like his owners?" Instead he asks, "Does this dog bite his owners?" But in accordance with the relative pervasiveness of a medical and ethological perspective in the certifying bodies, a diagnosis also includes an interpretation of motivation. The interpretive question posed by the pet behavior counselor is "Why does the dog bite?" The answer sought is one of establishing operations (EO) rather than maintaining contingency; though descriptive analysis of the contingency maintaining the bite may indicate that the bite terminates handling by the owner, the behavior counselor asks why the dog wants to terminate handling. The EOs themselves are considered from an ethological perspective, that is, within the realm of canine predisposed tendencies such as social positioning or prey pursuit.

To make this assessment, the behavioral evaluation includes information gathered on a large number of the dog's behaviors (Tortora, 1977; Voith & Borchelt,
Sometimes the counselor has a prepared sheet listing a myriad of dog responses that he or she presents the owner for evaluation, sometimes the dog's owner is asked to keep a diary of all the dog's responses for some specified period of time. The counselor then creates a profile of the dog's responding from this information. From this profile the dog's responding is categorized, that is, the counselor identifies patterns of behavior. These patterns are then labeled and the behavior classified (Tortora, 1977; Voith & Borchelt, 1982; Voith, 1981; Wright & Nesselrote, 1987; Overall, 1993; Goodloe, 1996; Borchelt, 1996; Borchelt & Voith, 1996; Overall, 1997; Reisner, 1998). Treatment choice is indicated according to classification on the basis of past intervention outcome within the same category. Of relevance however in considering treatment based on classification of behavior is that treatments designed to decrease responding belonging to one classification may actually increase responding that in reality belongs to a different classification (Stein, Dodman, Borchelt & Hollander, 1994).

The Behavioral Classification of Lunging

Lunge behavior can be found under five different diagnostic classifications as presented in Overall's *Clinical Behavioral Medicine for Small Animals* (1997). These classifications are dominance aggression, idiopathic aggression, interdog aggression, protective aggression, and territorial aggression. Of these, lunging is most commonly considered a form of dominance aggression, which ascribes the behavior to resource threat reactivity, and to territorial aggression, which ascribes the behavior to something akin to personal-space threat reactivity (Overall, 1993; Chesapeake Bay
Retriever Relief and Rescue, 2004). This latter view is supported by studies indicating that dogs commonly have an awareness of a critical distance in relationship to the area surrounding them, and encroachment on this area may evoke territorial intrusion responses (Overall, 1993, Borchelt & Voith, 1996).

Related to dominance aggression is “avoidance-motivated aggression.” Tortora (1983) defines avoidance-motivated aggression as behavior acquired and maintained by the prevention of anticipated aversive events. In light of the fact that dogs referred to dog trainers and behavior counselors for lunging problems necessarily come with a lunging-behavior history, it can be assumed that the variables maintaining their lunging responses may not be the same as those that shaped the initial episodes. Tortora’s avoidance-aggression theory postulates that avoidance-motivated aggression begins as an elicited response that inadvertently serves as an escape response that then matures into an avoidance response. He refers to acquisition of hurdle jumping in normal dogs by avoidance of traumatic shock (Solomon and Wynne, 1953) as an example of a similar learning pattern. Importantly, Tortora’s analysis includes that the original evoking stimulus condition need not be pain. Rather, it can be any event aversive to the dog including threat to resource control. Through higher-order conditioning and generalization, avoidance-motivated aggression can occur during stimulation not directly associated with the original unconditioned stimulus making it difficult for owners to identify evoking events. Accordingly, the evoking stimuli in lunging episodes may not have any obvious
significance, and maintenance of the lunging behavior may be distinct from
development of the response.

Another theory of motivation is "barrier frustration" aggression (SF/ASPCA, 2002). Barrier frustration aggression ascribes aggressive responses in dogs on-lead to frustration resulting from the leash's imposed restriction of the animal's natural tendency to investigate other dogs. The resulting frustration is then paired with the sight of dogs, evoking this emotion and evoking aggressive behavior at the sight of all dogs. Some support for this hypothesis can be found in Adelman & Maatsch's evaluation of frustration in extinction (1955).

Lastly, behavior deficit is another theory advanced as to why some dogs respond with inappropriate greeting or aggression to another dog. The speculation is that they do so because they've been denied adequate socialization with other good-natured dogs when puppies and thereby grow up with poor social skills and an inability to "read" other dogs (Dunbar, 1979; Herbert, 2001; Canine University, 2002). Other professionals doubt this theory however (Serpell & Jagoe, 1995; Overall, 1997), citing literature that supports that while puppies do experience a critical socialization period, interpretation of relationship gestures is learned from their dam and litter-mates (Scott, 1958). More commonly advanced is that inadequate socialization contributes to neophobic responding (Fox, 1968; Jagoe, 1994).

Behavior Management

Specific treatments for lunging behavior are uncommon in the literature but range from systematic desensitization to shock-motivated avoidance to deference
training (Tortora, 1983, Overal, 1997; Mc Connell, 2002; SF/SPCA, 2002). None of the treatments advocate treating the behavior during the actual expression of the response and instead counsel avoidance of the evoking circumstances, a reconditioning of the emotional response elicited by the evoking stimuli, or an increase in the general obedience and subordination of the dog to the handler.

Head Collars

Head collars were introduced as training aids for dogs in 1984 (Mugford, 1995). Head collars, such as the Gentle Leader®, are collars that a dog wears on its head in a manner resembling that of a halter on a horse. The Gentle Leader® is a nylon head collar that has an adjustable but non-slip strap that encircles the dog’s neck just below the occipital bone, and another strap that encircles the dog’s muzzle just rostral to the eyes. A D-ring that connects the straps is positioned below the neck in the throatlatch area, allowing for tightening of the muzzle strap. The collar attaches to a leash with the D-ring; tightening of the leash tightens the muzzle loop which facilitates in directing the dog’s head and thereby his body. Properly fitted, the collar does not necessarily close the dog’s mouth.

The Gentle Leader® collar allows the handler to exert control over the orientation of the dog’s head. This makes the collar a very likely tool for punishment of unruly behavior through both sudden restraint and response cost, as well as a device for the delivery of precisely timed negative reinforcement in the form of escape.
As with the introduction of many new products, acceptance by the general public of the head-collar as a training aid has been slow (Ogburn, Crouse, Martin, & Houpt, 1998; Haug, Beaver, & Longnecker, 2002). Many people who see the collars mistake them for muzzles. Regardless, head collars for dogs have enjoyed increasing popularity with dog trainers and behavior counselors as training tools in use with dogs (Haug et al. 2002). The likely reason for this increase in popularity are anecdotal reports that they work (Voith, 1995; Borchelt, 1996; Fields-Babineau, 2000; Milani, 2002; Underwood, 2000; Clothier, 2000; Powell, 2002; Derr, 2003; Reisner, 1998, Overall, 1997, Ogburn et al. 1998; Love & Overall, 2001; Haug et al. 2002). To date however, all that is available to the consuming public are subjective testimonies because, although studies have been done to evaluate dogs’ reactions to these collars (Ogburn et al. 1998; Haug et al. 2002), none have been designed to evaluate the actual efficacy of their use in producing desired behavior change. Also speculative is the controlling variable behind their influence over a dog’s behavior. Overwhelmingly, the popular companion animal literature and to a lesser extent the animal behavior literature attributes observed response modification accomplished with a head-collar to a purported influence on the dog’s perception of its social status (Fields-Babineau, 2000; Milani, 2002; Underwood, 2000; Clothier, 2000; Powell, 2002; Derr, 2003; Reisner, 1998, Overall, 1997, Ogburn et al. 1998).

Behavior Change

Behavior analytic research in the treatment of undesired behavior in the field of developmental disabilities has contributed an extensive library of therapeuti
methodological theory, application and results to the field of behavior change. While granting that all behavior does indeed include a motivative condition – an EO – grounded in the experimental analysis of behavior these treatment approaches do not rely on assumptions of the motivational basis of the undesired response as a necessary piece of the diagnostic approach. Rather they focus on the function of the behavior for the responding individual. In 1992 Iwata et al (1992/1994) designed a protocol in which the maintaining contingencies of target self-injurious behaviors (SIB) were identified through deliberate manipulation of different contingencies of reinforcement as well as different reinforcing stimuli. This landmark study wrote a supporting script for continuing and improved behavioral assessment. Functional analysis as a method of identifying controlling variables and thereby increasing the probability of effective intervention was established as an effective treatment methodology for a vast array of behavior problems. Once identified, reinforcement could be withheld or otherwise manipulated so as to change the target behavior.

An experimental functional analysis for the treatment of behavior in an applied setting is not always practical however (Vollmer & Smith, 1996). Under the constraints imposed by the applied setting for problems such as aggression, researchers often use descriptive rather than experimental analyses (Hall, Neuharth-Pritchett & Belfiore, 1997; Marcus, Vollmer, Swanson, Roane, & Ringdahl, 2001). Often this descriptive analysis must be designed according to direct observation and care-giver reports of the response topography and the contingencies surrounding the response (Thompson, Fisher, Piazza, & Kuhn, 1998). Analysis of changes in the
response helps to identify effect and, accordingly, suggest possible changes in the intervention. The resultant data may then provide information as to the response's function including the EO. An operational analysis of lunging, without additional information on behavior outside of the lunging situation (such as would be gathered in a profile so as to create a categorization), should provide preliminary information in creation of a functional approach to treating lunging behavior in dogs.

**An Operational Definition of Lunging**

Toddlers eat with their fingers, first-year psychology students say things like 'eliminating reinforcement will render a response extinct,' and dogs pull on their leashes. Leash pulling – indeed, owner dragging – is normal albeit improper behavior. If you adopt a 2-year-old beagle from a hunting kennel and you open the door of your car and let him out without a leash, it is a safe bet he will take off down the road toward a rabbit somewhere. If you are wise and you let him out of the car on a leash, he will attempt the same behavior and consequently your arm will be extended suddenly and the leash will be very taut. Leash pulling, regardless of the suddenness of onset of the behavior or the resistance strength exerted against the leash handler, is not lunging. The operational definition of lunging contains four necessary and sufficient criteria:

1. the forceful throwing of the dog's body
2. toward an evoking stimulus
3. with a general scrambling of the paws that, if uninterrupted, would serve to abruptly decrease the distance between the dog and the evoking stimulus
4. while maintaining attention on the stimulus

General attention to the stimulus, prancing, vocalization and piloerection are behavioral and physiological responses routinely concurrent with lunging, but they are neither necessary nor sufficient to the lunging response.

Lunging responses are subject to modification (they generally increase in frequency per opportunity), though the episodes rarely if ever consummate with actual physical contact. Accordingly it is unlikely that the reinforcement is the sensory stimuli associated with aggression, such as the sensation of pressure against the teeth. An increase in frequency suggests some reinforcing contingency however.

**Design of a Behavioral Intervention for Lunging**

Lunging dogs first display an orienting response toward the evoking stimulus and then maintain attention on their evoking stimulus throughout the lunge. While making no assumptions regarding the EO behind the reinforcement or the type of reinforcement involved, it can be assumed that both the orienting response and the attention maintained throughout the lunge is reinforced. The assumption of reinforcement behind the prolonged attention response offers the dog owner a tangible means of intervention by the contingent removal of the sight of the evoking stimulus (response cost). This strategy can be implemented by a blocking of attention facilitated by use of the Gentle Leader® head collar. Given data that indicate that both extinction and punishment procedures such as response cost and blocking are more successful in reducing aggressive responses and SIB when coupled with reinforcement concurrently available for alternative responses (Vukelich & Hake,
1971; Thompson, et al. 1999, O'Reilly, Lancioni & Taylor, 1999; Lerman, Iwata & Wallace, 1999), attention blocking should be most effective if an incompatible response – averting attention to the handler – is then negatively reinforced by a release of the restraining pressure created by the collar.

Behavior analysts have traditionally shown a preference for use of positive reinforcement in treatment of even severe and disruptive behaviors such as aggression (Marcus et al. 2001), and techniques such as differential reinforcement of incompatible behavior behavior (DRI), differential reinforcement of other behavior (DRO) or alternative behavior (DRA), and non-contingent reinforcement (NCR) are effective and popular in decreasing behavior (Baisinger & Roberts, 1972; Anger, 1983; Vollmer & Iwata, 1996; Heard and Watson, 1999). Accordingly, an explanation of the choice of blocking coupled with negative reinforcement for the intervention is warranted. The decision is based on data that indicate that in conditions of high activity, response cost is an effective treatment for reduction of undesired behavior (Rapport, Murphy & Bailey, 1982), and that DRO alone is less effective than DRO and punishment (Pelios, Morren, Tesch, & Axelrod, 1999). Findings by Fisher, Piazza, Cataldo, Harrell, Jefferson & Conner (1993) indicate that in some cases it is necessary to treat problem behavior through punishment before reinforcement of functional alternative behaviors can be effective.

DRI should be implemented during those occasions when the dog passes the evoking stimulus and yet turns its attention toward the handler. Non-contingent reinforcement (NCR) or a fixed-interval schedule of reinforcement (Poling &
Normand, 1999) is a popular choice in suppression of behavior in children with developmental disabilities, but the choice is not optimal in this situation. Contiguity has been shown to have significant influence in the control of exiting behavior; Imam & Lattal (1988) found response-reinforcer contiguity more influential in producing behavior than response-reinforcer contingency, and Madden and Perone (2003) found recently that close temporal contiguity of reinforcer delivery to target behavior had an adverse affect on the reduction of target behavior by DRA. Therefore, it seems prudent to reinforce instances of incompatible behavior rather than risk inadvertent reinforcement. Specifying an incompatible behavior, in this case the dog’s averting of its gaze to the handler, also helps with compliance from the handlers by giving them a specific stimulus image to cue their manipulation of the dog’s condition change. This can be important in stressful settings. Lastly, while NCR might seem applicable during non-lunge conditions such as when the dog simply does not show any response change in the presence of the evoking stimulus (the dog walks by a distracting dog but does not respond), DRO seems a better choice in that situation as well. The reasoning is the same – in fact the conditions better support that with NCR the handler might reinforce a lunge precursor or concurrent behavior such as attention or piloerection, a circumstance that has been shown to increase target responses (Smith and Churchill, 2002).

Thus, the rationale behind the intervention assumes a decrease in the frequency of the lunge behavior through punishment effected by both the sudden restraint necessary for immediate cessation of the behavior and response cost by loss
of sight of the evoking stimulus. It also involves differential negative reinforcement of the incompatible behavior of sitting still and focusing on the handler by release of restraint and the opportunity to again see the evoking stimulus.
CHAPTER II

METHOD

Participants and Setting

Subjects

Nine pet dogs and their owners participated. All of the subjects had been or were currently enrolled in a group dog obedience course, and subjects were selected on the basis of reports from obedience instructors indicating on-lead lunging and other control problems in the presence of evoking stimuli such as another dog or a person. All but one of the subjects were referred to the study by their obedience instructors. The non-referred subject was located via an ad placed in a local employment newsletter; this subject had been enrolled in a group obedience class but had recently been asked to leave the class and seek individual behavior counseling for the lunging behavior. A conference by phone and a meeting in person with the obedience instructor who had made the decision to move the dog from a group setting to individual instruction confirmed that the subject displayed chronic disruptive lunging responses in the presence of other dogs.

All of the subjects were adult dogs (ages ranged from 9 months to 6 years) who at the time of the study had completed at least one beginning obedience training class. All but two of the owners had used the Gentle Leader® head-collar previously
on their dog as instructed by their obedience trainers in an attempt to control their dogs’ lunging and had found the collar ineffective.

Recruitment/Selection

Subjects were solicited through advertisements in the local newspaper (*the Grand Rapids Press*), through a local company newsletter, and through local veterinarians and dog obedience instructors. As mentioned, all but one of the subjects was ultimately located through three local dog obedience instructors. Subjects were included solely on the merit of their referral by their obedience instructor as a dog with an on-lead lunging problem. No attempt was made to select for particular traits of owners or for dog breed, and no attempt was made to select on the basis of gender. Three of the dogs were intact bitches and two were spayed bitches, and four of the dogs were neutered males. There were no intact males in the study. Four of the dogs were purebreds (2 Boxers, 1 Great Dane and 1 Australian Shepherd), and the remaining five were mid-size to large mixed-breds. Of the nine subjects, none of the dogs was seen to exhibit aggression toward its owner although three were considered by their obedience instructors to display possible inappropriately dominant behaviors around their owners.

Participants

Three of the subjects, a spayed shepherd-collie bitch named Marley, a Great Dane bitch named Mocha and a Boxer bitch named Maggie were students in a Community Ed Beginning Dog Obedience Course offered by the Grand Rapids Public
Schools Community Education Department and were referred by their instructor. The other four subjects, a neutered Australian Shepherd named Dave, a spayed Doberman Pinscher-Labrador Retriever bitch named Sophie, a neutered Boxer named Sugar Ray, and a neutered mixed-breed male named Blue, were all past or present students of obedience classes offered by the Kent County Humane Society. All of these subjects were also referred by their obedience instructor. Marley’s owner was a young 8-months pregnant woman and consequently Marley was handled by the study investigator during all evaluation phases, otherwise all of the dogs were handled by their owners. Mocha was a large and strong dog and her owner was female, and the investigator lent assistance on three occasions to insure that the dog did not make physical contact with the distractor dog. All of the remaining dogs except Sophie were handled by women. Blue and Mocha were part of multi-dog families. With the exception of Dave, all of the dogs were presented to be good pets that fit well with their families; Dave had been adopted through the Humane Society, was currently enrolled in his second obedience course and was considered by his owner to be high-strung but personable. None of the dogs were reported to show aggression or lunging tendencies toward the people or other dogs in their families.

One of the dogs, Riley, was located through an ad in a local company-sponsored newsletter. Riley was a 1-year-old Staffordshire Bull Terrier mix that was enrolled in his second Beginning Obedience class at a local training school. He had completed a puppy course through the school and had done extremely well in the class and his owner had enrolled him in beginning obedience because he was
considering competitive obedience. However, the dog’s on-lead behavior had
deteriorated, and was now to the point that in this second beginning obedience course
Riley was exhibiting such disruptive behavior that his owner had been asked that he
leave the group class and seek individual behavior counseling.

The ninth subject, Wishbone, was referred by her Caledonia Public Schools
Community Education Dog Obedience instructor. Wishbone was a 6-year-old 10-15
pound terrier-beagle mix that had exhibited chronic lunging and aggressive displays
both at passers-by outside her home and when on-lead on walks.

Setting

    a. Analog Analysis Assessment

    Seven of the participants were exposed to evoking stimuli in the form of a
distractor dog and their responses evaluated under an analog or experimental method
as opposed to an applied analysis assessment. The analog assessment was designed
not as a means to determine function of the lunging responses but rather simply as a
means to evoke lunging behavior for evaluation of treatment. All data collection
phases as well as demonstration and instruction for owners of the intervention and
subsequent exposures to prompting stimuli during the analog assessment were
conducted in the training hall of the Kent County Humane Society. The referring
obedience instructors were present for the study. The training/testing room was 30
feet x 30 feet with windows to the outdoors that showed the exercise runs of the
numerous shelter dogs. Rubber runners matted the floor to ensure non-slip footing for
the dogs and the handlers. Two of these mats were placed parallel to one another
approximately 5 feet apart and running the length of the room so that the subject dog and the evoking dog came within 5 feet of one another as they passed each other on the mats. Other mats were set around the periphery of the training room to afford the handler a break from the distractor dog if needed. The setting remained constant for both conditions evaluated (flat collar and head collar), and included a random number of folding chairs set against the walls, and one table holding leashes, extra collars and record sheets. At all times the owner, three data collection attendants, one video-recording attendant and the treatment instructor were present. Between study phases dogs and owners were escorted to individual waiting rooms containing dog literature (for the owners) and dog toys (for the dogs). Subjects met in the training room as a group to check-in for the study, but at no time after check-in did the subjects see one another or the distractor dog outside of the data collection phases.

b. Applied Analysis Assessment

Two of the participants were exposed to the same type of evoking stimuli that prompted their referral to the study. For one of the subjects, Wishbone, all data collection phases as well as demonstration and instruction of treatment were carried out in the dog’s home and on walks through its neighborhood in the presence of one or both of its owners and occasionally the investigator. Data on Riley’s behavior were collected at the Kalamazoo Dog Training Club training building. This was an indoor facility housing three full-size and completely matted obedience rings. All three rings had obedience classes of varying levels, breeds and ages of dogs ongoing through the data collection process. Two vending machines and many chairs for spectator seating
were arranged against the wall that gave access to the obedience rings, as were numerous dog crates that contained dogs belonging to the obedience trainers and class participants.

Response Measurements

Dependent Variable

For all assessments the dependent variables (DV) for this study included (a) the frequency of lunging responses, i.e., the throwing of the body forcefully against the collar restraint and toward the evoking dog while thrusting forward on the hind legs and scrambling with the forelegs, (b) the frequency of attention to the distraction, and (c) the frequency of piloerection. The analog analysis assessment also included (a) the duration of each lunge (recorded from the beginning of a lunge to a termination of all related behavior), (b) the total duration of lunge responding during each phase, and (c) total duration of piloerection during each individual session (see Appendix A). Duration of relevant measures was recorded with timers by observing attendants during analog assessment.

Independent Variable

The independent variable (IV) in all assessments was an aborting of all lunging responses and restraint with the leash and head-collars. Upon lunging behavior emitted in response to an evoking stimulus, in one action, (a) the handler turned the
dog's head and body away from the distractor dog with the leash and collar and (b) drew her dog into a sit before her, and (c) restrained the dog with the collar in position facing her. The dog was held in that position until it (a) stopped struggling, (b) stopped attempting to look at the evoking stimulus and (c) the hair on its head, neck, shoulders and back laid down. At that point the handler immediately released pressure on the leash to allow the dog to assume whatever behavior it chose. If the dog resumed its lunging behavior, the treatment was repeated (see Appendix B).

Attention to the stimulus, vocalization and piloerection were considered as routinely concurrent with lunging and were also recorded, although those measures did not influence quantification of the lunge response itself.

Data Collection

Analog Analysis Assessment

Two trained observers and the treatment investigator were involved in real-time data collection, with target behaviors recorded by hand. One observer held a stopwatch and started the timer when the investigator indicated the session start. Event recording was used to record all response changes given by the dog during the 4-minute evaluation period, and duration measures were also gathered. Duration was recorded as from the beginning of the lunge to a termination of all related behavior (sitting focused on handler, coat laying flat).

Data collection was accomplished by announcement of the specific behavior changes by the investigator to the observer holding the timer who then announced the elapsed time. The second observer then recorded the time under the appropriate
category for the behavior (Appendix A). The sessions thus proceeded until the timer announced that 4 minutes had elapsed. All sessions/phases were video-recorded and an independent observer later scored the videotape in the same manner (elapsed time of behavior changes) but without sound for interobserver agreement purposes. The trained observer recording the elapsed time on the data collection sheets in real time was the primary data collector.

The phase sessions were divided into 4 one-minute intervals for scoring purposes. However, these intervals were not apparent to the subjects and there was no interruption of behavior at these intervals. Therefore, a response may have been initiated in the first interval but terminated in interval 2. Lunge duration data that crossed intervals was recorded accordingly in each interval, i.e., a 30 second lunge that began 15 seconds before the end of interval one and continued for 15 seconds into interval 2 was recorded as 15 seconds on interval one and 15 seconds on interval 2, and its frequency measure was recorded in interval 1 only.

Applied Analysis Assessment

All target behaviors were recorded in real-time by the dogs’ owners and an assistant of the owner’s choice. Event recording was used and durations were not measured (Appendix C). Data for Riley were collected during 55-minute obedience sessions, and data for Wishbone were collected during walks over a 4-week period as responses-by-exposure to a set number of evoking stimuli (12) per phase.

Interobserver Agreement

25
Analog Analysis Assessment

Total agreement ([agree/agree+disagree]*100) was calculated on response frequency and response duration between the real-time event time sheets and the videotape event time sheets on a randomly selected 30% of all the data within each dimension. Interobserver agreement on frequency measures was 86%, and on duration was 90%. It was noted that scoring of the videotape consistently resulted in lower total duration as well as lower frequency of lunging scores than did the real-time collected records. It is possible that the noise, confusion and personal witness to aggressive displays had some effect on the data collectors. Whatever may be the cause, if any, for the discrepancies, these data show that video taping of aggression displays for later scoring should be routinely practiced to insure unbiased record keeping.

Applied Analysis Assessment

No interobserver agreement was calculated or attempted for these assessments.

Design and Procedure

Experimental Design

Experimental design was a within-subject reversal (A₁ - B₁ - A₂ - B₂) design as such: A₁: baseline (regular collar), B₁: Gentle Leader® head collar treatment, A₂:
baseline (regular collar), B²: Gentle Leader® head collar treatment. The seven participants with behavior evaluated on the same day at the Kent County Humane Society in the analog assessment were randomly assigned an order for their first exposure to the distractor dog while wearing their regular control collar (phase A¹). The participants maintained this order for all four study phases. That is, all dogs completed phase A¹, and then returned in order to complete phase B¹, and then returned in order to complete phase A², etc.

Of the two dogs participating in the applied assessments, Riley’s responses were recorded on three different nights. A¹ data were recorded the first night, and on the second night, one week later, and B¹ data were collected. Due to a request by the obedience training school where the data were collected, no return to baseline (phase A²) was carried out and, instead, B² data were collected the third night. Wishbone’s data were recorded over a period of four weeks. This was due to the fact that, to insure that comparable evoking conditions were present in all phases, responses were recorded by exposure to a set number of evoking stimuli (12) per phase (opportunity to respond).

Procedure

a. Analog Analysis Assessment

Regular collar treatment (baseline): The owner was brought to the training area, shown the walking pattern and explained the probable behavior of the distractor dog. Any questions concerning what might be expected to occur during the session were also answered. The owner was then encouraged to handle her dog as usual and
use her leash as she had been taught in obedience school to give corrections when and how she deemed necessary during the trial. Owner and dog then exited the training room, and the distractor dog was brought in. Once the distractor dog was located on-lead on the far matted runway, the subject dog and its owner were brought back into the room. The investigator then indicated to the data collectors and to the dog’s owner the start of the session, and the owner began walking her dog toward the mat running parallel to the mat with the distractor dog. At the same time, the assistant handling the distractor dog began walking up and down the mat. The session proceeded in such a way that the dogs continued to pass each other on parallel mats until the session time (4 minutes) had expired or the owner got tired (one owner was pregnant and the instructor handled her dog during all phases of the study). None of the owners asked to terminate the study due to fatigue. When the session had expired, the assistant timing the session announced such, the distractor dog was removed from the room, and the dog and owner were ushered to their separate waiting room.

Gentle Leader® head collar treatment: once a dog and owner were returned to the training room for the second phase of the study, the investigator described the treatment and demonstrated the proper collar use on a demonstration dog. The demonstration dog was then removed, and the subject dog brought in and fitted by the investigator with the Gentle Leader® head-collar. The walking pattern was again described for the dog’s owner. Owner and dog then exited the training room, and the distractor dog was brought back in. Once the distractor dog was located on-lead on the far matted runway, the subject dog and its owner were brought into the room. The
session began and the owner started walking toward the indicated mat running parallel to the mat with the distractor dog. The assistant handling the distractor dog began walking up and down the mat at the same time. The session proceeded under the supervision of the investigator in such a way that the dogs continued to pass each other on parallel mats until the session time had expired (4 minutes) similar to phase A\textsuperscript{1}. Once the session expired and the assistant timing the session announced this, the distractor dog was removed from the room. The Gentle Leader\textsuperscript{®} collar was then removed from the subject dog and its flat collar returned, and the dog and owner were once again ushered to their waiting room.

b. Applied Analysis Assessment

Regular collar treatment (baseline):

Riley: Riley’s owner met the investigator at an off-site area without the dog where he was provided data recording sheets and collection instructions. Riley’s owner then took Riley to at the Kalamazoo Dog Training Club training facility for data collection during participation in an advanced obedience class. This class was selected by the training club for the purpose of data collection on the merit that the dogs involved in the class would be less reactive to Riley’s disruptive behavior. With the knowledge and accordance of the advanced-group obedience class instructor, her two assistants, and all class students, Riley was brought into the training area and allowed to work as if a class participant. Corrections were made as necessary or desired with his normal training collar (a prong collar) in the manner suggested
through earlier training episodes. Lunging responses were then recorded throughout the normal course of the 55-minute class.

Wishbone: The investigator went to the dog’s home and explained the collection and treatment procedures to the owners of the dog. Once data collection and a general description of the protocol were explained, all participants went outdoors. There the dog, handled by its owners, was taken around the block where it encountered those distractions that could normally be expected to be present. The dog was handled by the owners as instructed in a past obedience class. The investigator then left, and the owners continued data collection during similar walks until they had encountered 12 stimulus conditions that drew the dog’s attention and had in past experience evoked lunging responses.

Gentle Leader® head collar treatment:

Riley: The following week, phase B¹, the investigator met Riley and his owner at the Kalamazoo Dog Training Club training facility for participation in the same advanced class as had served for data collection for phase A¹. There the investigator both fitted Riley with a Gentle Leader® head-collar and demonstrated proper protocol and collar use directly on Riley himself. This was done using the normal distractions outside of the class area prior to the start of the class. Riley and his owner again participated in the class until the class was over (55 minutes) as during phase A¹, with the exception that the Gentle Leader® collar interventions were performed under the supervision of the investigator. One week later Riley’s owner returned without the investigator to collect data for phase B².
Wishbone: once Wishbone’s owners had completed phase A\textsuperscript{1}, they called the investigator who returned to demonstrate the phase B\textsuperscript{1} Gentle Leader\textsuperscript{®} head-collar intervention. The investigator fitted the collar to Wishbone and demonstrated the intervention protocol with distractions encountered in the dog’s neighborhood. The owners then began data collection on their own as in phase A\textsuperscript{1} until they had encountered 12 stimulus conditions which drew the dog’s attention and had in past experience evoked lunging responses. Wishbone’s owners continued to collect data without the investigator present for phase A\textsuperscript{2} and B\textsuperscript{2}. 
CHAPTER III

RESULTS

Analog Analysis Assessment

It was found during the analog assessments that recording of pilerection was unreliable at best, and this measure was disregarded.

Responding occasionally was initiated in the first interval but terminated in interval 2, and, accordingly, frequency and duration results should be considered jointly for accurate interpretation of responding. An interval might show one response, giving an impression of reduced behavior, but the lunge may have lasted for 45 seconds or may have come following termination of a lunge initiated in the previous interval.

Figure 1. shows that Marley, the shepherd-collie mix engaged in lunging behavior 13 times during the first no-treatment phase. These responses had a total duration of 154 seconds out of the 240, occupying 64% of the available time. Introduction of the intervention with the Gentle Leader® head-collar reduced her responses to 3 with a total duration of 15 seconds (6.5% of the available time). A return to baseline again increased her lunge duration to 65 seconds, or 27% of the time, with the frequency increasing slightly to 5 responses. Replacement of the Gentle Leader® head collar decreased her responding during phase 4 to 0. Marley’s response
patterns are indicative of punishment. Although her responding dropped of its own accord toward the end of both baselines, it did not recover at the start of phase B\textsuperscript{1} or B\textsuperscript{2}, but did recover at a return to baseline.

1a. Marley: Lunge Responses Per Minute During Baseline and Blocking Phases

1b. Marley: Lunge Duration Per Minute During Baseline and Blocking Phases

Figure 2 shows that, at first glance, the lunging responses of Dave, the Australian Shepherd, appear to be relatively unaffected by the intervention. Dave engaged in lunging behavior directed toward the distractor dog 11 times for a total duration of 64 seconds out of the 240, or 27% of the available time during the first no-treatment condition. Introduction of the Gentle Leader\textsuperscript{®} head-collar reduced the frequency to 7 responses, but increased total duration to 111 seconds. During the return to baseline condition his lunge frequency remained unchanged at 7 while the
duration decreased somewhat to 81 seconds. The second treatment exposure again increased lunge episodes, this time to 8 while the duration of each episode dropped dramatically with a total duration of 15 seconds out of the available 240. However, although Dave’s response frequency was not radically affected by this intervention and the frequency does decrease when A¹ is compared to B¹, the changes in the duration of his responses show effect that gives some evidence of extinction during phase B¹. The decrease in total response duration during A² supports this observation, while the final treatment phase data are actually indicative of punishment. Not much change in duration can be seen, but the lunges start out high in frequency and then drop rapidly. Given that the intervention includes response cost and negative reinforcement, it is difficult to dissect the different controlling variables and more than one is likely functioning here. Further data should be collected to better illustrate the influence of the treatment on Dave’s lunging behavior.

2a. Dave: Lunge Responses Per Minute During Baseline and Blocking Phases
2b. Dave: Lunge Duration Per Minute During Baseline and Blocking Phases

Figure 3 shows that Sophie, the Doberman Pinscher mix, lunged at the distractor dog 8 times during the first phase with a total lunging duration of 32 seconds out of the available 240. The first Gentle Leader® intervention phase decreased the responses to 6, but increased total duration to 36 seconds. Her second exposure to the distractor with just flat-collar corrections increased her responses again to 7, and although total duration dropped to 24 seconds there is some indication of recovery during the last minute of the phase. Re-introduction of response-cost dropped her responses to 2 with a duration of 2 seconds each. Sophie’s behavior did not show much change during phase B of the intervention, although her second exposure to the collar and response cost did reduce her responses to near zero.

As can be seen in Figure 4, Mocha the Great Dane lunged 7 times with a total duration of 92 seconds, an average of 13 seconds per lunge. During her first exposure to the Gentle Leader® and response-cost intervention her responses remained stable at 7 and her duration at 89 seconds. A return to baseline then increased responding to
9 and the total duration slightly to 97 seconds. Reintroduction of treatment however reduced responding dramatically to 1 lunge that had a 7-second duration. Mocha's initial reaction to the intervention could be indicative of extinction as the behaviors rise during the first and second minute of phase $B^1$ and then drop precipitously. A return to baseline sees responding recover immediately while $B^2$ sees a rapid and relatively stable decrease in lunging responses.

3a. Sophie: Lunge Responses Per Minute During Baseline and Blocking Phases

3b. Sophie: Lunge Duration Per Minute During Baseline and Blocking Phases
Figure 5 shows that Maggie, the 4-year-old Boxer, lunged 13 times with a total duration of 91 seconds. Introduction of the Gentle Leader® head-collar and response-cost reduced her responding to 0. A return to baseline produced 7 lunge responses with a total duration of 65 seconds (27% of the available time). Intervention with the Gentle Leader® again reduced lunge responding to 0. Though Maggie's data show a phase dependent decrease in responding, given that there was never any contingency change these results can not reasonably be attributed to punishment. Results are most
likely to a preoccupation with the collar and suppression of behavior rather than a punishment effect.

![Graph showing Maggie's lunge responses and durations per minute during baseline and blocking phases.]

5a. Maggie: Lunge Responses Per Minute During Baseline and Blocking Phases

5b. Maggie: Lunge Duration Per Minute During Baseline and Blocking Phases

Blue, a mixed-breed showed distinct reductions by phase as can be seen in Figure 6. During the first no treatment condition, Blue lunged toward the distractor dog 9 times for a total duration of 53 seconds. During the first treatment condition his frequency dropped to 6 and his total duration decreased to 18 seconds. During the return to baseline condition, his lunge frequency increased to 8, while the duration increased to 28 seconds. A second exposure with the Gentle Leader® reduced the
frequency to 0. His results are best interpreted as punishment because there is no
recovery in responding when he is re-exposed to the collar and intervention during B².

6a. Blue: Lunge Responses Per Minute During Baseline and Blocking Phases

6b. Blue: Lunge Duration Per Minute During Baseline and Blocking Phases

Sugar Ray, the 9 month-old Boxer male, produced data indicative of
moderate punishment effect as can be seen in Figure 7. Baseline produced 14
lunging responses with a total duration of 157 seconds (65% of the available
time), and intervention reduced responding to 7 with a total duration of 45
seconds. A return to no-treatment saw a small increase in responding to 9 with a total duration of 60 seconds, but re-exposure to the treatment effectively reduced responding to 3 with total duration to 9 seconds. Although the frequency contrast is small in the first 3 phases due to the relatively low and consistent over-all response rate, a simultaneous analysis of the duration and frequency data show that during the second baseline condition, although the rate is low, the duration of the lunges was high in the last minute. This represents a fairly robust recovery of the lunging response.

7a. Sugar Ray: Lunge Responses Per Minute During Baseline and Blocking Phases

7b. Sugar Ray: Lunge Duration Per Minute During Baseline and Blocking Phases
Applied Analysis Assessment


8a. Wishbone: Lunge Responses per 2-Trial Periods During Baseline and Blocking Phases
8b. Wishbone: Vocalization and Piloerction Per 2-Trial Periods During Baseline and Blocking Phases

Riley, a 1-year-old Staffordshire Bull Terrier mix, responded with attention to 20 distractions, vocalized 18 times, and emitted 16 lunging responses during the 55-minute obedience class that served as the A\textsuperscript{1} (baseline) phase. During the B\textsuperscript{1} treatment phase, intervention with the Gentle Leader® head-collar decreased attention to distractions slightly to 14, and decreased both vocalizations and lunges to 7 (Riley vocalized each time he lunged). The obedience school that hosted the trials requested that there be no return to baseline, and accordingly the following two phases were B\textsuperscript{2} and B\textsuperscript{3} intervention phases.

9. Riley: Responses Per Consecutive 10 Minutes of Obedience Class
CHAPTER IV

DISCUSSION

This study evaluated the effects of using response cost and differential negative reinforcement of incompatible behavior facilitated by the Gentle Leader® head-collar on lunging behavior in dogs. The goal of this study was both to show efficacy of the lunging treatment protocol and to provide preliminary data on the treatment design strategy behind the protocol. This strategy is meant for use when functional analysis is not possible or practical, and it advocates design of interventions based on manipulation of the variables manifested in execution of a behavior itself rather than on an assumption of contributing variables. This is in contrast to the popular approach practiced by animal behavior consultants of classification of behaviors and choice of treatment based on these classifications.

For instance, in evaluation of the response of evoked lunging in dogs, it is consistently observed that lunging dogs first display an orienting response toward the evoking stimulus and then maintain attention on the evoking stimulus throughout the lunge. Based on this observation, the treatment protocol suggested for this intervention is punishment of the lunging response through response cost of sight of the evoking stimulus.

The results suggest that in both applied and experimental settings, the protocol outlined in this study can be effective in reducing lunging behavior. However, these
data should not be applied to use of the head-halter collar outside of the protocol described in this intervention. Supporting this statement is the fact that all but two of these dogs had been trained on a head-collar by their owners under the supervision of a qualified dog obedience instructor prior to participation in this study. The importance of the collar lies in its usefulness as a tool in exerting control over the orientation of a dog’s head. This control allows a person handling a dog to deliver precisely timed punishment and negative reinforcement of appropriate behavior and to thereby use it as a tool in designed behavior change.

As suggested by the majority of the data, the principle at work in this intervention was most likely punishment. In the sense that the response is physically interrupted, the treatment is similar to the intervention of blocking widely in use in reduction of aggression and SIB in the developmentally disabled (Rolider & Van Houten, 1985). However, for the most part, response blocking interferes with the response rather than inhibiting it. Given the aversive nature of sudden restraint, that can not actually be assumed in this case. A point relevant to this observation of the aversiveness of sudden restraint is that regardless of the establishing operation of the lunging behavior itself, sudden restraint and loss of sight of the evoking stimulus influences a change in the functional effect of this EO by putting the dog in a new state. This fact should not be overlooked. Azrin and Holz (1966) report that when punishment is used to reduce responding for food the level of deprivation influences the results. Similarly, punished responding for water in water-deprived rats is influenced by the voltage of the shock (Vogel, Beer & Cody, 1971). Accordingly,
though certain EOs may be innate to the species under consideration, manipulation of competing EOs can counteract their influence.

As is sometimes the case in response blocking of undesired behaviors in the developmentally disabled, two of the dogs in the study generated response patterns somewhat consistent with extinction. For instance, a minute-by-minute evaluation of the duration/frequency data generated by the Great Dane Mocha during the first exposure to response cost showed that there was initially a marginal increase in responding at the onset of treatment and that, more importantly, these responses lasted longer than baseline lunges. This pattern is consistent with extinction and bursting (Lerman & Iwata, 1996; Smith, Russo & Le, 1999). However, that the response cost intervention functioned as extinction is an unlikely possibility. Lalli et al (1996) distinguishes response blocking from extinction with the observation that blocking interrupts the response whereas, by contrast, extinction is response occurrence without reinforcement. The evoking stimulus in the lunging intervention stays relatively unaffected by the intervention and remains present throughout. Whether sigh of this stimulus functions as reinforcement or not, the stimulus condition itself does not change. It is the dog’s opportunity to see the stimulus that changes. If Mocha’s response pattern indeed reflected extinction it had little to do with the evoking stimulus. Given that Mocha was familiar with the head-collar, the extinction may have occurred to loss of escape; struggling may have been reinforced in the past with escape from restraint, and this escape was now no longer available for her struggling behavior.
The other dog that showed evidence of increasing responses during phase B was Dave. As mentioned earlier, since Dave’s responding never stabilized in any of the phases, no conclusion can be drawn from his data. Dave’s behavior would best be evaluated with further testing that included data collection that was not limited in some way but was able to continue until stable responding could be established in the different phases.

Beyond consideration of the treatment, the only way to truly assess the contributing variables and their functions in this treatment is to do a functional analysis. Such a study would not only offer further data on the efficacy of turning the dog’s gaze from that of the evoking stimulus and negatively reinforcing attention elsewhere, it could also provide the dog counseling community with information on the functional control of the head-halter. This could be facilitated if both a pre- and post-intervention behavioral assessment of the subjects was included in future studies evaluating use of a head collar in treatment of lunging. Such an assessment could help determine both the behavioral demographics of lunging dogs, if any, and to see if there is evident change in these behaviors following intervention.

One incidental bit of information that warrants consideration can be taken from the behavior emitted by the distractor dog used in the analog assessment analysis. This dog, a Manchester Terrier, maintained an ongoing repertoire of lunging, barking and complete inattention to its handler throughout the 6+ hours of the study. A pet of a volunteer at the Humane Society, this dog was so wildly successful at his task of distraction that there was no need to replace or relieve him. Beyond sparing
admiration for his tenacity and endurance (as well as that of his handler), it should be recognized that, (a) he never habituated to passage of the other dogs on the mats parallel to him even when they themselves did not emit lunging responses toward him, (b) there was little modification in his behavior even though there were varying consequences contiguous with his behavior and, (c) he had never met nor had he ever been handled by the person who walked him on lead that day. He also lunged faithfully at every shelter dog he spied, be they innocuous or playful. Rather than ponder possible motivation for this behavior, we can take home this information concerning lunging behavior: (a) lunging can be an extremely stable repertoire, (b) lunging is not necessarily evoked by the social or threat gestures from other dogs, and, (c) even small dogs can create a great deal of hullabaloo.

The only obvious conclusion that can be drawn from this study beyond that of the reduction in frequency and duration of lunging shown by the dogs while wearing the Gentle Leader® head-collar, is that it is not necessary to profile and classify a behavior to design and execute effective treatment for that behavior. No assumption of EOs for the lunging behavior can be drawn from the fact that the collar effected a change in the response, because it is simply too easy to mistakenly presume the underlying variables contributing to a change in behavior based simply on observation of the change itself (Marcus et al. 2001). Anecdotal evidence serves perhaps as a starting point, a foundation for development of an experimental question, but it should not serve beyond this capacity. The tendency to make descriptive analysis assumptions concerning the variables controlling a target behavior can both
artificially restrict intervention approaches and techniques and misdirect independent variable manipulation. A good example of this was evidenced in this study by Riley’s results. The instructors at his obedience school told Riley’s owner that Riley’s behavior could not be controlled within the walking scenario per se because it was rooted in dominance assertion. As mentioned earlier, it was requested that he leave the group classes, and was instructed to receive one-on-one counseling with a behavior consultant where relationship issues could be addressed. This approach to Riley’s lunging behavior would have removed him from the evoking stimuli necessary for behavior change.

It was not the intent of this study to attempt to define or categorize lunging as a functional response class so as to draw inferences about the establishing operations→reinforcement contingency of lunging and from there make a functional interpretation of the treatment. No assessment of traits or groups of traits outside of the lunging behavior was done with any of the subjects. Therefore, no presumptions were made by considering such traits as functionally common operants within a response class that might be extended to include the target behavior of lunging. Rather, a relatively effective intervention for this unwanted behavior was designed based on observation of the manifestation and discernible execution of the behavior itself. Though functional analysis of behavior is the best predictor of successful outcome of treatment, in the absence of an opportunity to perform such an analysis this abridged analysis may serve to facilitate desired behavior change.
Experimental functional analysis has been shown to offer the greatest predictor of effective treatment outcome through efficacious treatment design in treating self-injurious behavior and aggression in the developmentally disabled (Iwata, Dorsey, Slifer, Bauman & Richman, 1982/1994; Hall, Neuharth-Pritchett & Belfiore, 1997), producing higher average percentage-of-zero-data comparison scores than treatments that did not include an EFA (Campbell, 2002). Accordingly, EFA is the most efficient way to assess the variables controlling the target behavior so as to best design intervention (Derby, Wacker, Peck, Sasso, DeRaad, Berg, Asmus, & Ulrich, 1994; Thompson et al. 1998; Pelios et al. 1999). However, analog functional analysis (AFA) can also be utilized when analysis in the field is not practical or possible. Given that it is unethical to repeatedly expose an unsuspecting individual to the rowdy, unruly and agonistic lungings of a boisterous dog, AFA is likely the most practical way to evaluate the contributing variables in lunging. Further studies utilizing AFA to assess the variables contributing both to the manifestation and maintenance of lunging and the efficacy of intervention with the Gentle Leader® head collar in reducing its frequency and duration are a logical next step in pursuing knowledge of applied dog behavior manipulation and change.
Appendix A

Gentle Leader ® Collar Introduction/Use
BASIC GENTLE LEADER® COLLAR INTRODUCTION/USE: Begin by snapping your dog's leash to the ring on the collar (this ring will hang from the nose band below your dog's chin). Next, size the collar to fit your dog: hold the collar under your dog's throat, draw the straps that have the snaps on their ends up behind his ears at the base of his skull, and take up the slack (the collar should fit relatively snugly). Remove the collar now and, holding the double-D-ring, pull the nose band up so that it forms a loop. Slip the nose-band loop over your dog's nose, and snap the collar in place at the back of his head. Quickly pick up the leash. If (when) your dog tries to use his paws or rub his nose on the floor to remove the collar, immediately lift his nose into the air with the leash. Keep his head up and the leash taught until he stops struggling. The instant he stops struggling, release the leash tension. Be prepared to repeat this tightening process each time the dog struggles. Always release the tension the instant the dog stops struggling.

Key Points of the Training:
1. always tighten the leash and lift the dog's head when he struggles against the collar
2. always keep the tension on the leash for as long as the dog struggles, even if he gets quite excited
3. always release the tension the instant the dog stops struggling.

LUNGING TRAINING: When your dog lunges at another dog or some other distraction, the lunging is handled through use of the collar. Do not yell at the dog. Instead, bring the dog around to face you with his leash and collar (pull on the leash to pull the collar). Using the leash, lift up on the collar until he sits, looking up at you. Sometimes it is necessary to use a bit of strength to control the dog's head, and sometimes it is necessary to use your leg to swing the dog's rear out away from you to keep your dog facing you. Do not kick your dog, you are simply using your leg as leverage, and be careful not to trip yourself. Keep a tight hold of the leash, keeping the muzzle up toward you and your dog facing away from the distraction, until your dog stops struggling. When your dog stops struggling, release some tension but keep the leash taut and the dog sitting in position until he looks at you instead of the distraction (the dog does not necessarily need to look at your eyes or face), and the hair on his shoulders and/or back/rear lays down. Then release the tension on the collar. Do not worry if the dog goes right back to lunging or being nuts, simply repeat the procedure.

Key Points of the Intervention:
1. do not yell at the dog
2. use the leash and collar to swing the dog away from the distraction and toward you
3. do not allow the dog to see the distraction
4. keep the tension on the leash and the dog facing you until:
   a. he stops trying to get away or see the distraction
   b. he looks up at you
   c. his hair lies down
5. repeat the procedure as necessary
Appendix B

Lunging Test Record Sheet: Analog Analysis Assessment
DATE: ________________

DOG LUNGING RESPONSE RECORD SHEET

Name: ____________________________  Dog's Name: ____________________________

Address: __________________________  Breed: ___________  Age: ______

Phone: ____________________________  Gender: ____________________________

Veterinarian: ________________________  Did your veterinarian refer you to this study? Yes __No

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Appendix C

Lunging Test Record Sheet: Applied Analysis Assessment
LUNGING TEST RECORD SHEET

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<td>Gender:</td>
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<td>Did your veterinarian refer you to this study? Yes _ No _</td>
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<td>Did your obedience instructor refer you to this study? Yes _ No _</td>
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<td>Her/His name:</td>
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The Psychology Department at Western Michigan University is doing a study on control of lunging behavior in pet dogs. We are asking if pet owners with dogs that lunge at strangers or other dogs would like to be a part of the study. We are looking for dogs that lunge at people or animals either when they are on a leash or when they are simply loose in the house and they see someone or something come into their yard. We want to see if a use of a special humane head-collar for on-lead lunging and a behavior modification program for in-home lunging will work to stop the lunging behavior. We think it will. If you wish to participate and if your dog lunges when he is on-lead, you will be asked to attend a training-and-evaluation session. This session will be in controlled setting with other dogs that lunge. There you will learn how to use the new collar and then participate in an evaluation of its effectiveness in controlling your dog's lunging (the collars are provided free-of-charge). If your dog lunges at people or animals at your home and you want to participate in this study, you will be asked to learn the behavior modification procedure with provided instruction, a procedure which involves non-threatening re-direction of the dog's attention and behavior, and asked to then record your dog's lunging behavior at your home and participate in an evaluation of the procedure's effectiveness. If your dog lunges both on-lead and off-lead, you can participate in both studies. You may check with your veterinarian before joining the study if you want his or her advice.

If you decide that you want to be a part of the study for dogs that lunge on-lead, you will be given the time and location of the training/evaluation session and asked to attend. If you decide that you want to be a part of the study for dogs that lunge at things in their home, you will be given an observation recording sheet. An experienced animal behavior consultant (Jennifer Sobie) will instruct you on how to keep the records. She will also tell you how to teach your dog to stop lunging. You will be given her phone number and you may call her at any time during the study with any questions or concerns that you might have regarding the study or your dog's behavior. The in-home lunging study will last at least three weeks and someone will come to your house at least twice during that time for data collection.

This study and its training procedure will create no known risks other than those you may already face in handling your dog, but it will take up your time and may be inconvenient. As in all research, there may be unforeseen risks to the participant. If an accidental injury occurs, appropriate emergency measures will be taken; however, no compensation or additional treatment will be made available to you except as otherwise stated in this consent form. You will have access to consultation on your dog's behavior throughout the study. You may drop out of the study at any time and for any reason, and if you choose to quit the study it will not affect your relationship with Western Michigan University now or in the future or cause any loss of service. All personal information will be kept secret, and your name will never be used. While we might write about the study, no personal information will be used. The results of this study could help many pet owners who have dogs that lunge. If you have any questions after today, please feel free to call Jennifer Sobie at 616-897-6729 (Grand Rapids), or 269-833-0427 (Kalamazoo), or Dr. Lisa Baker at 269-387-4484. The participant may also contact the Chair, Human Subjects Institutional Review Board (269-387-8293) or the Vice President for Research (269-387-8298) if questions or problems arise during the course of the study.

I, ______________________, have read this statement and have had all my questions answered.

Date: ________ Signature: ___________________________ Witness: ___________________________
Appendix E

Advertisement For Subjects
Does Your Dog Lunge at Other Dogs?

Western Michigan University is conducting a study to determine the effectiveness of a new behavioral treatment and humane collar developed to eliminate lunging or aggressive behavior that occurs when the dog is around people or other dogs. If you would like to be a part of this study with your dog, or if you have any questions concerning this study, please call 616-833-0427 (Kalamazoo), or (Grand Rapids) 616 897-6729 and ask for Jennifer.
BIBLIOGRAPHY


Sobie, J. (1998). This rough magic: learning theory as it applies to dog training. *Front and Finsih, 7*, 4-6


