# EFFECTS OF A STANDARDIZED OBEDIENCE PROGRAM ON APPROACHABILITY AND PROBLEM BEHAVIORS IN DOGS FROM RESCUE SHELTERS

A Thesis

by

LAUREN DENISE HAYS

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

August 2004

Major Subject: Animal Science

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Approved as to style and content by:

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**ABSTRACT**

Effects of a Standardized Obedience Program on Approachability

and Problem Behaviors in Dogs from Rescue Shelters.

(August 2004)

Lauren Denise Hays, B.S., Texas A&M University

Chair of Advisory Committee: Dr. Theodore H. Friend

Improved adoptability is a common goal among rescue shelters. Dogs are more likely to be adopted if they are friendly, mannerly, and approachable. The possibility of improving rescue shelter dogs' behavior through an obedience program has not been examined. We developed an approachability test to determine whether dogs became more approachable during and after a standardized 12-week obedience program. We also quantified jumping behavior and pulling on the leash to measure if these problematic behaviors also improved through training. The subjects consisted of 26 dogs donated to the Triple Crown School for Professional Dog Trainers for one of the 12-week sessions. The approach test was administered six times, at two-week intervals. The tests were videotaped and jumping and pulling behaviors were quantified after testing. Scores for approachability were based on the proximity between the tester and the dog at the end of each test. For the dogs that completed all 12 weeks of the study, contingency analyses were performed for each behavioral measure. Relative to the start of the 12-week training program, the dogs became more approachable ($p<0.025$), jumped less ($p<0.025$), and pulled on the leash less ($p<0.025$) than when the study

began. These results reinforce the importance of obedience training as a tool for increasing a rescue shelter dog's adoptability and permanence once placed in a home.

## DEDICATION

This study is dedicated to the subjects, the rescue shelter dogs. It is my hope that their new homes provide them with the lives of joy they so richly deserve.

## ACKNOWLEDGEMENTS

First and foremost, I owe the idea and completion of this entire study to Christ Jesus. Every step of the way I have counted on His guidance, and my prayers were answered.

Secondly, my family deserves my eternal gratitude for their support, advice, listening ears, and open arms. From the planning of the little things to the execution of the big things, this would not have been possible without them.

I would also like to thank my advisor, Dr. Ted Friend. He has patiently helped me throughout this project, and has given his time, energy, and expertise willingly. I greatly appreciated his invaluable advice along the way.

I also wish to thank Dr. Jane Packard for her incredible contribution of knowledge in the area of canine behavior. Without her creative insights, this study would not have seen the same success.

I would also like to acknowledge Dr. Tom Welsh for his contribution of time, encouragement, and energy in being on my committee.

I wish to thank my fellow graduate students for helping with every test during the study. I know the job was rough sometimes and the energy spent was great, but I could not have done it without you, and every moment was appreciated.

Finally, I would like to extend a very great thanks to the staff of trainers and administrators at Triple Crown. Your agreement to participate in this study made it all possible, and I hope this study will further your purposes in the training of dogs.

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# INTRODUCTION

Domestic dog behavior problems present a challenge to many sectors of the human and animal community. Pet owners, trainers, veterinarians, and rescue shelters all must face the difficulties of dealing with problematic dogs. Many studies have examined methods for improving dog behavior (Van der Borg et al., 1991; Serpell and Hsu, 2001), the measurement of temperament traits (Hsu and Serpell, 2003; Svartberg and Forkman, 2002; Ledger and Baxter, 1997; Reufenacht et al., 2002), and the prediction of future behavior (Van der Borg et al., 1991; Goddard and Beilharz, 1986; Svartberg, 2002). Dogs are often placed in rescue shelters for problematic behavior (Van der Borg et al., 1991), most commonly for behaviors associated with hyperactivity, vocalization, or general disobedience (Ledger and Baxter, 1997; Wells and Hepper, 1992). Wells and Hepper (1992) showed that the public values temperament most highly when looking for a dog to adopt from a shelter and specifically, a quiet dog at the front of the enclosure will be more likely adopted.

Obedience training has been shown to improve behavior problems in dogs (Clark and Boyer, 1993; Campbell, 1986) as well as improve the human-canine relationship. It is hypothesized that a formalized obedience program can improve approachability, decrease jumping up, and decrease leash-pulling in rescue shelter dogs. To test this hypothesis, we conducted behavioral tests for each of these problem behaviors, and measured improvement for each category as a formal obedience training program progressed.

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This thesis is in the style and format of the Journal of Animal Science.

## LITERATURE REVIEW

*Behavior of Domestic Dogs*

It has been theorized that the domestic dog (*Canis familiaris*) came to be the creature it is today through the selection of wolves (*Canis lupus*) and wild dogs that ventured into close proximity with the early humans (McConnell, 2002). Although many behaviors between the wolf and the domestic dog are still nearly identical, domestication has revealed new behaviors and new ways to use old behaviors (Fogel, 1990). Some of these behaviors are desirable and beneficial to the human society, while others are problematic, time-consuming, and dangerous to people.

Svartberg and Forkman (2002) described five personality traits in the domestic dog. The traits were narrowed into the categories of 'Playfulness', 'Curiosity/Fearlessness', 'Chase-proness', 'Sociability', and 'Aggressiveness'. Samuel Gosling (2003) at the University of Texas described four distinct dimensions of canine personality including: 'Energy', 'Affection', 'Emotional Reactivity', and 'Intelligence'. Tests for personality traits and temperaments of dogs have been proposed in recent years (Goddard and Beilharz, 1984 and 1986; Ledger and Baxter, 1997; Netto and Planta, 1997; Ruefenacht et al., 2002; Serpell and Hsu, 2001; Svartberg, 2002; Svartberg and Forkman, 2002; Van der Borg et al., 1991; Weiss and Greenberg, 1997). The common link between these studies lies in the motivation to better the dog/human bond, and in some cases, aid in finding more successful matches between a potential owner and a dog at a rescue shelter.

*Characteristics of Dogs in a Rescue Shelter*

As each year passes, the number of dogs admitted to rescue shelters increases (Wells and Hepper, 1992). In an analysis of dogs admitted to a rescue shelter, 25.5% of the dogs were brought to the shelter because of behavioral problems (Ledger and Baxter, 1997). Of the dogs that had been adopted from the shelter and subsequently returned, 69.2% were due to behavior problems. Two distinct groups compose the population of dogs at a rescue shelter: those handed into the shelter by their owners, and strays found in the streets (Wells and Hepper, 1992). Dogs between the ages of eight months and two years are the most likely to be adopted (Weiss and Greenberg, 1997), and a strong preference is shown among potential owners for dogs at the front of the enclosures as opposed to the back (Wells and Hepper, 1992).

Numerous studies have examined the behavior of domestic dogs housed in rescue shelters (Ledger and Baxter, 1997; Van der Borg et al., 1991; Weiss and Greenberg, 1997; Wells and Hepper, 1992 and 1999). According to Weiss and Greenberg (1997), most rescue shelters currently employ some type of selection test in an attempt to place dogs in homes where they will stay. Despite the testing, dogs are still returned to the shelter 40-to-60% of the time (Weiss and Greenberg, 1997). Animal shelters that responded to one survey cited problem behavior (usually more than one type in each dog) as the most common reason for a dog to be initially surrendered or returned to a shelter (Van der Borg et al., 1991).

*Occurrence of Problem Behavior*

According to the national State of the American Pet Survey (Purina Pet Institutes, 2001), the top three dog behavior problems encountered by dog owners include barking and/or growling (17%), jumping on people (13%), and begging for food (11%). Other problem behaviors listed by the Purina Pet Institute include pulling on the leash, digging, and biting. Voith et al. (1992) listed aggression, elimination, and vocalization as the top three most commonly described behavior problems. According to Van der Borg et al. (1991), veterinarians and behaviorists consider aggression, fear, separation anxiety, and disobedience to be the most frequently occurring problems among pet dogs. It was also noted however, that each dog owner will define problem behaviors differently. Campbell (1986) reported that jumping is the most prominent problem, followed by barking. Ledger and Baxter (1997) cited boisterousness, inter-dog aggression, and human-directed aggression respectively as the most common behavior problems. According to a recent survey, Australian dog owners described general overexcitement and specifically jumping on people to be their dogs' top two behavior problems (Kobelt et al., 2003). It seems that for as many sources, owners, and experts that exist there are as many differing opinions on what are the most significant of the behavior problems among dogs.

Information from numerous authors suggests that between 17 and 25% of all the pet dogs at animal shelters are left there because of behavioral problems (Hsu and Serpell, 2003). Perhaps more significant than the number of relinquished dogs is that

behavioral problems are some of the leading reasons for euthanasia in both the United States and Europe (Hsu and Serpell, 2003).

*Ontogeny of Behavior Problems*

As noted above, the list of behavior problems is long and varied, with many different layers of complexity and categorical definitions. Summarizing the most frequently described problems in past studies; jumping up, barking, aggression, fearfulness, and disobedience constitute the major problems typically found in rescue shelter dogs.

*Jumping.* The dog's jumping behavior can be motivated by numerous causes such as fearfulness, attention-seeking, defensiveness, and dominance. In a rescue shelter, jumping up is most commonly due to the dog's general overexcitement (Kobelt et al., 2003), which is possibly heightened both by the lack of exercise and the typically bare environment of a rescue shelter (Ledger and Baxter, 1997). This behavior is characterized by the dog's front feet leaving the floor (possibly followed by the back feet) and the placement of the front paws against a person's body.

*Barking.* Barking in the kennel environment can also be due to many causes. Visual/noise stimulation (Campbell, 1986), aggression, attention-seeking, excitement, and fearfulness are some of the most common.

*Aggression.* Aggression comes in many forms; however, in the rescue shelter environment, fear-related and dominance aggression are the most frequently displayed forms of aggression (Van der Borg et al., 1991). As described by Van der Borg et al.

(1991), fear-related aggression is defined as the dog taking on a low posture, possibly crawling or freezing, growling, baring teeth, snapping/biting and pilo-erection occurring along the neck and back. Dominance aggression takes on similar signals, but the dog's posture will be high and stiff (Van der Borg et al., 1991).

*Fearfulness.* As defined by Van der Borg et al. (1991) a fearful dog will show a low posture, try to escape, freeze, tremble, or crawl. To be classified as fear, these elements cannot be accompanied by any aggressive signals.

*Miscellaneous.* General disobedience and pulling on the leash are also prevalent behavior problems in dogs from rescue shelters (Van der Borg et al., 1991). Pulling on the leash was cited as the most frequent behavior problem in dogs from rescue shelters placed into a new home (Van der Borg et al., 1991).

*Solutions for Behavior Problems*

*Pharmacological Solutions.* In veterinary practice, tranquillizers are divided into two categories: anti-psychotic and anti-anxiety (Fogle, 1990). These types of medications can reduce overactive behavior, suppress aggression, and calm anxiety. Hormones are the other major drug used in canine behavioral therapy (Fogle, 1990). Synthetic progesterone can reduce dominance aggression, roaming, and marking behaviors in the male dog. Drug therapy however is not a viable option for many dog owners because of the expense and the temporary suppressive effects it has on the dog's behavior.

*Behavior Modification.* One of the main goals of behavior modification for problematic dogs is an improvement in the dog-owner relationship (Clark and Boyer, 1993). This relationship has been shown to improve through obedience training, behavior counseling, and lifestyle changes (Clark and Boyer, 1993). Of the three groups in the Clark and Boyer (1993) study, the obedience group had significantly fewer behavior problems than the two groups that received no obedience training. Jagoe and Serpell (1996) showed that obedience training, which is a type of behavior modification, reduced competitive aggression, separation-related problems, and roaming/escaping behavior. These results also supported the idea that other types of behavior modification such as changing the dog's meal times and sleeping arrangements can reduce the prevalence of behavior problems. Some types of behavior problems are not addressed in the typical obedience class and these types of problems would not necessarily decrease in frequency after the completion of an obedience class (Voith et al., 1992). However, behaviors such as hyperactivity, jumping up, and fearfulness are likely to show improvement through obedience training (Clark and Boyer, 1993). Campbell (1986) suggested that some sort of training (formal or informal) is desirable, and that formally trained dogs will show the fewest behavioral problems. It has been theorized that obedience training may be the communication tool needed to improve the human-canine relationship (Clark and Boyer, 1993), and this could improve the lives of dogs both in homes and in shelters.

## MATERIALS AND METHODS

Because fearfulness is a frequently cited behavior problem among dogs from rescue shelters, we developed an approach test to detect any fearful or aggressive response that was present in each dog. The approach test was also used to obtain the data for the problem behaviors of jumping and pulling on the leash.

*Subjects*

The study's sample group consisted of the dogs donated by local rescue organizations to the Triple Crown Academy for use in their 12-week school for dog trainers. The dogs came from a wide variety of breeding and environmental backgrounds. The history of the dogs was unknown, but each dog was originally donated to a rescue organization. However, most dogs are surrendered to a shelter because of behavior problems (Marston and Bennett, 2003). The breed variety was diverse and included both mixed and pure breeds. All of the dogs were between the ages of nine months and four years.

Throughout the 12-week program, only the student trainers worked with and trained the dogs. Twenty student handlers participated in the program. During training, the students were supervised, instructed, and reviewed by the Triple Crown instructors. Students were also allowed to work with the dogs when instructors were not present. The dogs donated to the program by the rescue shelters were all taught basic obedience. If an individual dog showed appropriate drives, they were also taught tricks or trained for agility, tracking, narcotics detection, or protection work. The basic obedience

program consisted of teaching loose leash walking, heeling, sit, down, come, place, sit before going through a door, and basic manners. It was required that the dogs be competent in these commands both on and off leash.

The dogs were all brought to the Triple Crown facility on the same day. The dogs were given approximately four hours of rest in their individual kennels, after which the first test was performed.

*Approachability Test*

Anecdotal evidence has shown that most humans approach dogs in such a way that will bring out fear or aggression if it is present in the dog. This approach, which is typically slow with an outstretched hand, is a threatening posture when taken by a stranger. Our test was designed to imitate this common misconception and test the dogs with the most typical approach.

Each dog was taken from the kennel by a staff member and walked with a flat collar and leash to the climate-controlled Triple Crown event center. The dog's six-foot leash was handed to a volunteer that was unknown to the dog. The volunteer stood three feet away from the back wall of the event center for the duration of the test and held the end of the leash to give the dog room to move in a full circle around the volunteer. The floor in front of the volunteer with the dog was marked in two-yard intervals with tape. Each segment of flooring represented one progression made by the tester. The tester began the test at the first tape mark, which was ten yards from the end of the dog's leash. The tester steadily approached the dog until the tester or the other expert observer ended

the test. If the tester was able to progress all ten yards, the dog was petted by the tester and the dog was scored a one. When each test was over, the staff member would take the dog's leash from the volunteer and walk the dog back to the kennel. The test lasted a maximum of five minutes per dog and was stopped at the distance which elicited a fearful or aggressive response. Each test lasted approximately 45 seconds. All six tests for each dog were performed in the same location in the event center.

The people required for each test consisted of the researcher, the two expert observers (one of which was testing the dog), the volunteer holding the dog, and the video camera operator. The researcher guided the other people through the testing procedures, while recording scores and notes. The expert observers were certified behavior and training specialists from Triple Crown with extensive experience in the observation of dog behavior. The expert observers conferred after each test and the average of their scores provided the approachability score for each dog. The score was based on the distance at which the dog showed a fearful or aggressive response. A response was considered to be any type of body posture or vocalization associated with fear or aggression, as known by expert observers of dog behavior. The expert observers judged at which point the test should be ended, allowing for inter-rater reliability across the tests. The tester moved through the steps outlined below. The volunteer held the end of the six-foot leash while the tester approached the dog. The volunteer did not move or interact with the dog in any way. The video camera operator stopped and started the taping of each test when cued by the expert observer. A few casual observers of the test were permitted no closer than ten yards.

All the dogs were retested every other week in the manner described above for as long as they stayed in the obedience program. Of the original 26 dogs, 16 were tested six times and were present throughout the twelve weeks. For each test, the dogs were divided into two groups. During alternate tests, one group was tested by a male staff member and the other half of the group was tested by a female staff member. This varying of testers was to help control for gender effects (Lore and Eisenberg, 1986; Wells and Hepper, 1999). The dogs were scored on an approachability scale of one to five based on the distance which, according to the expert observers, elicited the fearful, aggressive, or generally unapproachable response. At the end of the tests, each dog had a set of six approachability measurements, one from each week of testing.

*Distance and Scores.* A description of the approach test is outlined below.

*10 Yards (Score of 5):* The tester entered the building and approached the dog, stopping at a designated line ten yards from the end of the dog's six-foot leash.

*8 Yards (Score of 4):* The tester slowly moved squarely toward the dog, making direct eye contact, moving two yards closer to the dog.

*6 Yards (Score of 3):* The tester slowly moved two yards closer to the dog, making eye contact, projecting one arm and hand directly toward the dog, and slightly leaning forward.

*4 Yards (Score of 2):* The tester slowly moved two yards closer to the dog, making eye contact, projecting both arms and hands directly toward the dog, and leaning slightly forward.

*2 Yards or Fewer (Score of 1):* The tester slowly moved two yards toward the dog, making eye contact, projecting both arms and hands directly toward the dog, leaning steeply forward, and attempting to pet the dog's head.

*Jumping Behavior*

The video tapes of the approach tests were analyzed in order to quantify jumping. All-occurrences sampling (Lehner, 1996) was employed to quantify jumping from the video tapes. To ensure intra-observer reliability (Lehner, 1996), the same person performed all of the video tape analyses. The tapes were analyzed twice. The two data sets for jumping were compared, and the data from the first viewing was identical to the data from the second viewing.

For a jump to be counted, the dog's front and possibly also back feet left the ground and contacted the volunteer's body. The duration of time that the dog's paws were in contact with the volunteer was not considered.

*Pulling Behavior*

The same procedure used to quantify jumping behavior was used to quantify pulling behavior. Again, the two data sets from the video analysis were identical.

A pull was counted when a dog moved away from the volunteer, leaned into the collar, and the leash was taut. Each time the tension on the leash was relieved by the dog moving back toward the volunteer, the individual pull was complete. Neither the duration, nor the strength of the pull was considered.

*Statistics*

To measure improvement in the approachability score, number of jumps, and number of pulls, the dog's scores from the first and second test were averaged, and then subtracted from the average of the dog's scores from the fifth and sixth test. This calculation produced a number with either a negative or a positive sign, where a negative sign would indicate improvement.

Statistical significance was determined using a contingency model (Ott and Longnecker, 2001). The formula for the $x^2$ Test of Independence was employed, where the number of dogs that improved or worsened (observed), was compared to the number of dogs that would have improved or worsened by chance (expected). The sum of the squared difference of the observed number, minus the expected number was divided by the expected number. The dogs showing no change were not included in the contingency analysis. Only the dogs that completed the 12-week program were included in the

analysis. Significance level was determined using a chi square table and one degree of freedom.

An alternative analysis using the Freeman-Tukey Deviate (Bishop et al., 1975) was also performed and is included in Appendix 1.

# RESULTS

*Approachability Test*

The majority of the dogs showed a general improvement in approachability during the training (Table 1). A few of the dogs never deviated from a score of 1 throughout the testing. Table 1 also depicts the dogs that did not complete the 12 weeks of training. All of the dogs were required to remain in training for a minimum of four weeks, after which they were available for adoption to the public or to the student handler.

The dogs that completed the entire twelve week program are further analyzed in Table 2. The difference column represents the amount of improvement over the tests. This score was calculated by averaging the scores from Tests 5 and 6, and subtracting that number from the average score of Tests 1 and 2. For this measure, lower scores represent better approachability (the tester was able to get closer to the dog), and higher scores represent less approachability (the tester could not get as close to the dog).

Table 1. Approachability scores based on how close the tester could approach the dog before the dog displayed a fearful and/or aggressive response

| | Test Number | | | | | |
|---|---|---|---|---|---|---|
| Dog Name | 1 | 2 | 3 | 4 | 5 | 6 |
| Dogs Completing 12 weeks (n=16) | | | | | | |
| Cappuccino | 4 | 5 | 2 | 2 | 1 | 1 |
| Gus | 5 | 3 | 1 | 1 | 1 | 1 |
| Kit | 4 | 3 | 2 | 3 | 1 | 1 |
| Clyde | 4 | 3 | 1 | 1 | 1 | 1 |
| Pete | 3 | 3 | 2 | 2 | 1 | 1 |
| Marley | 4 | 3 | 2 | 2 | 2 | 1 |
| Bear | 2 | 4 | 1 | 1 | 1 | 1 |
| Foxi | 4 | 3 | 2 | 4 | 2 | 2 |
| Dixie | 2 | 4 | 4 | 1 | 2 | 2 |
| Luke | 2 | 2 | 1 | 1 | 1 | 2 |
| Ashley | 1 | 4 | 1 | 2 | 2 | 2 |
| Belle | 4 | 3 | 3 | 3 | 3 | 3 |
| Popeye | 1 | 1 | 1 | 1 | 1 | 1 |
| Zorro | 1 | 1 | 1 | 1 | 1 | 1 |
| Chance | 1 | 3 | 2 | 3 | 3 | 2 |
| Beau | 3 | 4 | 5 | 4 | 5 | 5 |
| Dogs not completing 12 weeks (n=10) | | | | | | |
| Kojak | 1 | 2 | 3 | 3 | | |
| Sarge | 3 | 3 | 4 | 2 | 3 | |
| Tritan | 1 | 4 | 2 | | | |
| Freckles | 1 | 1 | 1 | 1 | 1 | |
| Paris | 4 | 3 | 1 | 2 | 2 | |
| Ranger | 2 | 2 | 2 | 2 | 2 | |
| Munson | 2 | 3 | 1 | 3 | 1 | |
| Cherokee | 3 | 1 | 1 | 2 | 2 | |
| Lucy | 1 | 1 | 1 | 1 | 1 | |
| Ivy | 2 | 2 | 2 | 2 | 1 | |

Table 2. Change in approachability between Tests 1 and 2, and Tests 5 and 6

| Dog Name | Mean Score: Tests 1 and 2 | Mean Score: Tests 5 and 6 | Change |
|---|---|---|---|
| Cappuccino | 4.5 | 1.0 | -3.5 |
| Gus | 4.0 | 1.0 | -3.0 |
| Kit | 3.5 | 1.0 | -2.5 |
| Clyde | 3.5 | 1.0 | -2.5 |
| Pete | 3.0 | 1.0 | -2.0 |
| Marley | 4.5 | 2.5 | -2.0 |
| Bear | 3.0 | 1.0 | -2.0 |
| Foxi | 3.5 | 2.0 | -1.5 |
| Dixie | 3.0 | 2.0 | -1.0 |
| Luke | 2.0 | 1.5 | -0.5 |
| Ashley | 2.5 | 2.0 | -0.5 |
| Belle | 3.5 | 3.0 | -0.5 |
| Popeye | 1.0 | 1.0 | 0.0 |
| Zorro | 1.0 | 1.0 | 0.0 |
| Chance | 3.0 | 3.5 | +0.5 |
| Beau | 3.5 | 5.0 | +1.5 |

These data suggest that most of the dogs were more approachable by the time they completed the training program (Table 2). A negative change represents improvement and increased approachability. However, one dog's score is dramatically worse by the end of the training. Beau's scores are unique because he began protection training at the eighth week of training. Protection training encourages the dog to bark, growl, or show other threatening postures when approached by a stranger. The protection training is the reason for Beau's approachability score being the highest (5) of all the dogs at the end of training (Table 2).

In the contingency analysis, all of the sixteen dogs that completed the program were used to calculate significance, except for Beau. Training was shown to

significantly improve approachability ($p<0.025$). This indicates that the dogs were less fearful, and in some cases less aggressive than when the testing began.

*Jumping Behavior*

Many of the dogs tested did not display jumping behavior. The four dogs performing the most jumping during Test 1 (Cherokee, Chance, Ivy, and Munson), all performed no jumping behavior by the last time they were tested (Table 3). All of the dogs that performed no jumps during Test 1 also performed no jumps during the last test (Table 3).

Variance also existed in the force with which the dogs' paws contacted the volunteer. Some dogs jumped from a run and nearly toppled the volunteer, while others very slowly stood up on their back legs and placed their paws gently on the volunteer. This variability suggests that the dogs had different motivations for performing the behavior. Each dog's level of energy was apparent throughout testing, and was reflected by the force with which they jumped.

Table 3. The number of jumps for dogs participating in the Triple Crown program

| | Test Number | | | | | |
|---|---|---|---|---|---|---|
| Dog Name | 1 | 2 | 3 | 4 | 5 | 6 |
| Dogs completing 12 weeks (n=16) | | | | | | |
| Chance | 5 | 0 | 1 | 0 | 0 | 0 |
| Ashley | 1 | 3 | 0 | 0 | 1 | 0 |
| Bear | 2 | 1 | 3 | 0 | 0 | 0 |
| Popeye | 3 | 2 | 6 | 4 | 1 | 1 |
| Pete | 3 | 0 | 0 | 0 | 0 | 0 |
| Kit | 1 | 0 | 0 | 0 | 0 | 0 |
| Luke | 0 | 1 | 3 | 0 | 0 | 0 |
| Zorro | 1 | 3 | 3 | 1 | 3 | 0 |
| Foxi | 0 | 0 | 0 | 0 | 0 | 0 |
| Marley | 0 | 0 | 0 | 0 | 0 | 0 |
| Clyde | 0 | 0 | 0 | 0 | 0 | 0 |
| Cappuccino | 0 | 0 | 1 | 1 | 0 | 0 |
| Dixie | 0 | 0 | 0 | 0 | 0 | 0 |
| Gus | 0 | 0 | 0 | 0 | 0 | 0 |
| Beau | 0 | 0 | 0 | 0 | 0 | 0 |
| Belle | 0 | 0 | 0 | 0 | 1 | 0 |
| Dogs not completing 12 weeks (n=10) | | | | | | |
| Kojak | 3 | 0 | 0 | 0 | | |
| Sarge | 0 | 0 | 0 | 0 | 0 | |
| Tritan | 0 | 0 | 0 | | | |
| Freckles | 3 | 8 | 2 | 0 | 1 | |
| Paris | 1 | 0 | 0 | 0 | 0 | |
| Ranger | 0 | 0 | 0 | 0 | 0 | |
| Munson | 4 | 0 | 2 | 0 | 0 | |
| Cherokee | 6 | 0 | 1 | 0 | 0 | |
| Lucy | 1 | 2 | 0 | 2 | 0 | |
| Ivy | 4 | 0 | 1 | 1 | 0 | |

*The blank spaces represent tests for which the individual dog was not present.

The improvement in jumping for the sixteen dogs completing the study is shown in Table 4. The measure of change in the last column is the focus of the study because this is how improvement for each test was measured. Negative chance indicates improvement or a reduction in jumping. If no improvement was found in an individual dog, other factors must be considered. Overall, the dogs that completed the twelve-week program showed a significant decrease in jumping by the end of training ($p<0.025$) (Table 4).

Table 4. Change in jumping between Tests 1 and 2, and Tests 5 and 6

| Dog Name | Mean Jumps: Tests 1 and 2 | Mean Jumps: Tests 5 and 6 | Change |
|---|---|---|---|
| Chance | 2.5 | 0.0 | -2.5 |
| Ashley | 2.0 | 0.5 | -1.5 |
| Bear | 1.5 | 0.0 | -1.5 |
| Popeye | 2.5 | 1.0 | -1.5 |
| Pete | 1.5 | 0.0 | -1.5 |
| Kit | 5.0 | 0.0 | -.5 |
| Luke | 0.5 | 0.0 | -.5 |
| Zorro | 2.0 | 1.5 | -.5 |
| Foxi | 0.0 | 0.0 | 0.0 |
| Marley | 0.0 | 0.0 | 0.0 |
| Clyde | 0.0 | 0.0 | 0.0 |
| Cappuccino | 0.0 | 0.0 | 0.0 |
| Dixie | 0.0 | 0.0 | 0.0 |
| Gus | 0.0 | 0.0 | 0.0 |
| Beau | 0.0 | 0.0 | 0.0 |
| Belle | 0.0 | 0.5 | +.5 |

Because hyperactive behaviors such as jumping are considered an undesirable behavior by most pet owners (Goodloe and Borchelt, 1998), the goal is to decrease jumping.

The contingency analysis showed significant improvement in the dogs' jumping behavior by the end of training ($p<0.025$). Although the data were not statistically analyzed for the dogs that did not complete the program, all of those dogs showed decreased jumping behavior (Table 3). Most of the dogs that completed the twelve-week program and initially demonstrated jumping behavior decreased in frequency of jumps over time (Table 4).

*Pulling Behavior*

All of the dogs showed pulling at some point during the twelve weeks of training. However, some dogs pulled much harder than others. According to casual observation by the volunteer, the three pit bulls (Zorro, Popeye, and Lucy) pulled extremely hard. In contrast, smaller dogs such as Ivy pulled gently on the leash. The duration of each pull, although not measured, also demonstrates variability among the dogs. These variables are likely due to breed type, energy level, and other factors affecting the dog's motivation to pull on the leash. Dogs showing a high number of pulls during Test 1 usually showed a marked decrease in pull number by their last test (Table 5). The data for the dogs that did not complete the program, although not statistically analyzed, suggests that most of the dogs were pulling less when they left than when they arrived (Table 5).

Table 5. The number of pulls for dogs participating in the entire Triple Crown twelve-week program

| | Test Number | | | | | |
|---|---|---|---|---|---|---|
| Dog Name | 1 | 2 | 3 | 4 | 5 | 6 |
| Dogs completing 12 weeks (n=16) | | | | | | |
| Luke | 7 | 2 | 4 | 2 | 1 | 0 |
| Pete | 4 | 6 | 1 | 1 | 1 | 2 |
| Popeye | 6 | 4 | 3 | 2 | 2 | 1 |
| Chance | 5 | 3 | 3 | 1 | 1 | 1 |
| Marley | 5 | 2 | 4 | 2 | 2 | 0 |
| Bear | 3 | 3 | 2 | 0 | 0 | 1 |
| Ashley | 2 | 1 | 1 | 2 | 0 | 0 |
| Beau | 2 | 2 | 0 | 0 | 1 | 0 |
| Cappuccino | 2 | 3 | 1 | 1 | 1 | 1 |
| Gus | 2 | 1 | 2 | 2 | 0 | 1 |
| Kit | 1 | 1 | 2 | 0 | 0 | 0 |
| Clyde | 1 | 1 | 1 | 0 | 0 | 0 |
| Zorro | 6 | 4 | 4 | 4 | 4 | 5 |
| Dixie | 0 | 1 | 0 | 0 | 0 | 1 |
| Belle | 4 | 2 | 2 | 3 | 2 | 4 |
| Foxi | 0 | 0 | 0 | 0 | 1 | 0 |
| Dogs not completing 12 weeks (n=10) | | | | | | |
| Kojak | 1 | 4 | 2 | 3 | | |
| Sarge | 1 | 2 | 1 | 1 | 1 | |
| Tritan | 4 | 2 | 0 | | | |
| Freckles | 1 | 4 | 6 | 4 | 1 | |
| Paris | 4 | 1 | 0 | 0 | 2 | |
| Ranger | 4 | 2 | 3 | 2 | 2 | |
| Munson | 8 | 4 | 4 | 4 | 2 | |
| Cherokee | 2 | 2 | 1 | 0 | 0 | |
| Lucy | 10 | 6 | 3 | 5 | 1 | |
| Ivy | 5 | 1 | 2 | 2 | 1 | |

The change column in Table 6 is the key indicator of improvement. A negative value shows improvement (fewer pulls), and a positive value shows an increase in the problem behavior (more pulls). A value of zero indicates no change in behavior.

Of all the dogs showing improvement, the least improved was Zorro (Table 6). This dog was placed in narcotics detection training at the eighth week of the program. In narcotics detection training, the dog is encouraged to pull and strain at the leash before hunting for the substance. The dog is taught to seek the substance in a fast and reliable way. When the substance is found, the dog is rewarded with a ball or other toy. Zorro's narcotics training seemed to have an impact on his willingness to pull during testing.

Pulling on the leash is a common behavior viewed as undesirable by dog owners (Marston and Bennett, 2003). Our measures showed that most of the dogs completing the twelve week program pulled on the leash less than when they began the program.

Pulling behavior was significantly improved ($p<0.025$) by the training program. Since all sixteen dogs showed pulling behavior in either the first two tests or the last two tests, they were all included in the contingency analysis.

Table 6. Change in pulling from Tests 1 and 2, and Tests 5 and 6

| Dog Name | Mean Pulls: Tests 1 and 2 | Mean Pulls: Tests 5 and 6 | Change |
|---|---|---|---|
| Luke | 4.5 | 0.5 | -4.0 |
| Pete | 5.0 | 1.5 | -3.5 |
| Popeye | 5.0 | 1.5 | -3.5 |
| Chance | 4.0 | 1.0 | -3.0 |
| Marley | 3.5 | 1.0 | -2.5 |
| Bear | 3.0 | 0.5 | -2.5 |
| Ashley | 1.5 | 0.0 | -1.5 |
| Beau | 2.0 | 0.5 | -1.5 |
| Cappuccino | 2.5 | 1.0 | -1.5 |
| Gus | 1.5 | 0.5 | -1.0 |
| Kit | 1.0 | 0.0 | -1.0 |
| Clyde | 1.0 | 0.0 | -1.0 |
| Zorro | 5.0 | 4.5 | -0.5 |
| Dixie | 0.5 | 0.5 | 0.0 |
| Belle | 3.0 | 3.0 | 0.0 |
| Foxi | 0.0 | 0.5 | +0.5 |

## DISCUSSION

This study provides useful information on whether a standardized obedience program could improve the behavior of dogs from a rescue shelter. Improvement can be gained in at least three aspects of a domestic dog's behavior: approachability, jumping, and pulling on the leash. Although the sample size was small, the proportion of dogs that improved versus those that did not improve was quite high, as was the statistical significance.

Fearfulness was the most commonly reported problem among new owners of dogs from rescue shelters (Wells and Hepper, 2000). Fear is a complex issue of dog behavior, but it can be easily expressed in a dog during an approach test. The testing implemented in our study was designed to gently elicit fear if it was present in the dog. The approachability scores in our study showed a significant trend ($p<0.025$) toward the dogs becoming less fearful and more approachable throughout the obedience program. Since greater approachability is associated with greater friendliness, these results are also affirmed by the results of Goodloe and Borchelt's 1998 study. Their findings showed that with obedience training, the dogs' friendliness and compliance traits were increased.

The findings suggest that the implementation of a standardized obedience program can significantly improve hyperactive behavior problems such as jumping up on humans. Since it has been reported that hyperactivity is one of the most common reasons for a dog to be relinquished to an animal shelter (Miller et al., 1996), decreasing the behaviors that stem from hyperactivity, such as jumping up, would also decrease a

dog's chance of being given to a shelter. Our results support Goodloe and Borchelt's (1998) findings that dogs in obedience training show lower frequencies of rough-type play behavior, such as jumping. This study found that obedience training can significantly improve this behavior ($p<0.025$).

Pulling on the leash and similar disobedient behaviors have been described by Marston and Bennett (2003) as training issues and therefore modifiable. As another behavior linked to hyperactivity, pulling proved useful for testing. In this study, pulling on the leash was indeed shown to significantly improve with obedience training ($p<0.025$). Since pulling was identified by Van der Borg et al. (1991) as one of the most common post-adoption problems, it is encouraging to find that it can be diminished with the proper training.

For each of the three measures of improvement employed in this study, more dogs showed improvement than did not, and overall the dogs showed significant improvements in behavior. The alternative analyses of the data also support these conclusions (Appendix 1). By the sixth test, according to the expert observers, twelve out of sixteen dogs were more approachable than they had been at the beginning of the testing. Jumping behavior either decreased or did not worsen in fifteen out of the sixteen dogs that completed the testing. It is interesting that all of the dogs whose jumping behavior did not change (difference = 0) never showed jumping throughout all six tests. Pulling on the leash also was decreased as testing progressed. By the sixth test, thirteen out of sixteen dogs pulled fewer times per test than they had at the first test.

Numerous external factors could have impacted the results of this study. One crucial element to any training regime is the human handler. The human-canine bond has been described as a physically measurable entity (Marston and Bennett, 2003), and therefore deserves attention in any study where both species are present. Handlers in this study were new and inexperienced, and could have slowed the dogs' learning. However, most owners are not professional trainers, so this study represents the typical handler.

Additionally, not all of the dogs were able to complete the study. If a dog was adopted by an individual outside the program, the rescue organization responsible for that dog would make the decision to take the dog out of the program. Also, some of the handlers chose to adopt the dog they were training, and may have chosen to remove the dog from testing. Due to these adoptions, the subject number was reduced by the end of the program.

Another factor that could have skewed the results of this study, or at least the results of some aberrant dogs' scores, is that the subject dogs' backgrounds were unknown. Dogs with little to no previous association with humans could have shown very little improvement in approachability over the relatively short span of twelve weeks. Dogs that had been neglected in homes or not disciplined were likely to be those that showed the most behavior problems. Other dogs that had reasonably good and balanced histories could have been in a prime state for obedience work and showed the best improvements. Nevertheless, despite unknown backgrounds, the playing field of adoption can be leveled through an obedience program.

It would be beneficial for future researchers in this area to build on some of these ideas and modify others. Specifically, it would helpful to perform follow-up evaluations of the dogs adopted out of this program. The permanence of the dogs' obedience training would be likely to influence whether or not the dogs remained in the homes they had been placed in. Also, Triple Crown's method of obedience training may vary from other training programs. Examining whether another method of training would affect the trends found in this study could certainly be beneficial.

Caution should be applied when generalizing this study to a large population. The sample was not random and many factors could not be controlled. However, our results show that the probability of the dogs' behavior improving to the level that it did in this study by chance is less than 2.5%. This study's internal validity, quantifiable measures, and statistically significant results lend strong support to the hypothesis that obedience training can improve behavior and possibly the adoptability of dogs from rescue shelters.

## CONCLUSION

Post-adoption retention could be bettered by the provision of an obedience program for both the dog and the new owner (Marston and Bennett, 2003). Problems associated with behavior are the most common reasons for dogs to be sent back to the shelter (Marston and Bennett, 2003). More specifically, control and training problems have been cited as the most common of the behavior issues.

The Triple Crown program is an excellent example of altruism for both parties involved. The trainer's academy has access to many dogs with which students can learn, and the rescue shelter receives cost-free training for their dogs, which is known to make those animals more adoptable. Perhaps the party that benefits the most from this arrangement is the dog, as a program such as this can create a permanent home and lifetime of stability. Not only does our study show vast and significant improvement in the dogs' behavior through the training, it is also supported by the fact that two of the dogs showing questionable improvement or even worsened behavior had been placed in specific training. Due to their success in the specialized training, these dogs were distinguishable from the other dogs.

Our findings support training for rescue shelter dogs. The high proportion of dogs that improved is a strong indicator that a formalized obedience program is one step toward making a dog more adoptable. For all three measures, the dogs became significantly more approachable ($p<0.025$), jumped significantly less ($p<0.025$), and pulled significantly less ($p<0.025$). Our results suggest that dogs with unknown

backgrounds from rescue shelters can quickly and steadily improve, in at least three behavior areas, through a standardized obedience program.

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# APPENDIX

To test whether the three measures of behavioral improvement were greater than expected by chance, the Freeman-Tukey Deviates were calculated (Bishop et al., 1975). The equation for this test statistic is: sqrt(O)+sqrt(O+1)-sqrt(4*E+1), where O is the observed value and E is the expected value. At the level of $p > 0.05$, this z statistic indicates a significant deviation from random when values are greater than 0.95. Observed values were significantly greater than chance for the following variables: approachability (chi-square Goodness of Fit = 7.14; 1 d.f.; z = 1.68), jumping (chi-square Goodness of Fit = 5.56; 1 d.f.; z = 1.47), and pulling (chi-square Goodness of Fit = 10.36; 1 d.f.; z = 1.96). These results did not change the conclusions based on calculation of the Chi-square statistic (uncorrected for small sample size), as presented in the text of this thesis. However, since there is considerable controversy among statisticians regarding use of a Yates correction factor when the Chi-square goodness of fit test is calculated for small sample sizes (Lehner, 1996), the z statistic was calculated as a more conservative measure. Some statisticians might consider the z score a more appropriate test statistic than the Chi-square contingency test, due to a better match between the assumptions of the z test, the nature of the data and the research question (J. M. Packard, personal communication).

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