# Service dog selection tests: Effectiveness for dogs from animal shelters

Emily Weiss [*], Gary Greenberg

*Psychology Department, Wichita State University, Wichita, KA 67260-0034, USA*

## Abstract

Assistance dogs are trained to help people with various physical and mental handicaps. These dogs are selected using a test comprising several behavioral components. Anecdotal reports have shown that only about 50% of the dogs so selected successfully complete training and become assistance dogs. Traditionally training centers had used puppies, but recently some trainers have begun to use dogs from animal shelters and pounds. This study randomly chose six males and three female adult dogs of appropriate breed types, from a shelter environment and conducted an 11-item selection test on each. The dogs were then trained in both basic obedience and a retrieval task. We found no correlation between an animals' overall performance on the selection test and its ability to complete the retrieval task. One behavior trait, fear/submission, however, was predictable from the selection phase. © 1997 Published by Elsevier Science B.V.

*Keywords:* Canine; Service dog; Temperament test

## 1. Introduction

Dogs have been associated with humans for over 14 000 years (Prestrude and O'Shea, 1996; Riddle, 1987). They have served as companions, guards, hunters, herders, medical subjects, and guides. Selection of a dog for a particular task is often based on matching the task to the breed, attempting to choose one with the appropriate physical and psychological attributes. This procedure is inexact and frequently results in potentially costly mismatches. Recently, however, the selection of dogs to be used to assist humans who are physically or mentally challenged has been made even more difficult by the introduction of pound and animal shelter dogs as candidates.

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[*] Corresponding author. Fax: +1 (316) 978 3086.

## 2. Specialization

Dogs have been bred for an almost endless variety of uses, from guarding and herding, to lap dogs and as a symbol of prestige. Today there are over 400 breeds of dog (Wilcox and Walkowicz, 1991), with continuing refinements to change existing breeds as well as to create new ones. The refinements focused on by breeders include differences in size, leg length, muzzle length, size and attitude of the ears, changes in coat type, and tail carriage. These changes help to "build" a dog that is physically more capable of performing particular tasks such as chasing and burrowing for rodents (the terrier group) or pointing game (the pointer group).

Some tasks that rely on established breeds include search and rescue, substance detection (i.e. drugs or explosives), and the broad category of service dog, which includes guide dogs, dogs for the deaf, dogs for people in wheelchairs, and therapy dogs (Allen and Blascovich, 1996). The characteristics required for search and rescue and detection tasks include energy and endurance, mobility, strength, sociability, high curiosity, trainability, and keen senses. The characteristics required of the service dog vary depending on the particular type of service to be performed.

## 3. Service dogs

The most familiar of the service dogs is the guide dog, used by the visually impaired to help them navigate through the world. The guide dog has been assisting humans since World War I (Pfaffenberger et al., 1976; Prestrude and O'Shea, 1996). Guide dogs need to be large, have a good attention span, be very trainable, not territorial, neither highly submissive nor dominant, and have high endurance. The dog type most often trained for these purposes was the German Shepherd, but there has been a decline in its use and an increase in the use of Labrador Retrievers and Golden Retrievers. Trainers switched to the retrievers because the German Shepherd had trouble with "down time" (lying passively by while the owner eats, works, sits in class, etc.), whereas the retrievers are much more adaptable to this lack of activity (Witchel, 1996).

A second type of service dog is the dog for the hearing impaired, sometimes called a hearing-ear dog. This dog has a much different role from that of the guide dog. It alerts the hearing impaired person to certain important sounds, such as a baby's cry, a fire alarm, or the person's name. Size is not important with this type of dog and so small mixed breeds are often used. The hearing-ear dog needs to be a very high energy dog that is slightly dominant.

The seizure alert dog is the most controversial of the service dogs. These dogs are alleged to be able to sense the onset of an epileptic seizure before the human is aware of it. This allows the person to find a safe place before the onset of the seizure. The Prison Pet Partnership Program has trained these dogs, but they, and others, are not sure what the animals are sensing (Edney, 1993; Miller, 1992, 1993; Schulins, 1994); thus trainers can only work with dogs that show an increased interest in a human during a pre-seizure state. While there is an abundance of anecdotal evidence about seizure dogs, we were

unable to identify empirical data to confirm their ability to sense seizures. It may be that these dogs are able to sense biochemical changes in a person about to have a seizure, just as they are able to detect other things that humans cannot, including hidden drugs, explosives, and fire accelerants used by arsonists (Prestrude and O'Shea, 1996).

Dogs are increasingly being used to assist people who are confined to wheelchairs. Such dogs provide increased mobility by helping to pull the wheelchair, pick up dropped items, operate light switches, etc. (Allen and Blascovich, 1996). Because of the physical demands on these dogs, only large, sturdy breeds can be considered. The first dog of this type was a Turkish sheep guard dog trained in 1983 (Valentine et al., 1993). Most often, Golden Retrievers are used because of their reputation as being easily trainable and having stable personalities.

## 4. Selection

Although guide dogs had been used earlier, the large numbers of soldiers injured during World War II led to their more widespread use of such dogs. Many veterans had lost their sight and the government needed to provide them with help (Pfaffenberger et al., 1976). Because of the increased need for good dogs, the need for an adequate selection process became more pressing. The Guide Dogs for the Blind school in California, for example, began training hundreds of dogs between 1942 and 1947, although only 35 were able to successfully complete the training program (Pfaffenberger et al., 1976).

In 1947 the first puppy test for the selection of guide dogs was developed by Pfaffenberger and Scott (Pfaffenberger et al., 1976), and was put into use by their school. The Guide Dogs for the Blind test was based on studies that would be later published by Scott and Fuller (1965) on the genetics of the social behavior of the dog. They reported that the behavioral development of dogs could be divided into different stages based on social changes in the puppy. These stages include the neonatal, transitional, socialization, juvenile, pubertal and parental.

During the socialization period (3–12 weeks) the puppy easily forms attachments. If not exposed to humans during this period, a puppy will react extremely fearfully when it is finally exposed to humans (Scott and Fuller, 1965). These findings are the basis for the selection test they later developed. Puppies are tested many times during the socialization period in order to determine if they are suitable for the training regimen.

Pfaffenberger reported that the failure rate of dogs entered in the training process but unable to complete it, decreased to approximately 50% with the use of the selection test. The test became an important asset for training programs because, even though 50% is a large failure rate, it is lower than the failure rate when no selection test was used. The results of an assessment of Pfaffenberger's test (Dietrich, 1983) showed that 58.6% of the dogs that entered training completed training. These results are similar to those originally reported by Pfaffenberger et al. (1976). It is important to note that in some programs an animal is *not* considered a failure if it does not become a guide dog, but instead is shifted into the breeding program or a therapy dog program.

A series of studies by Goddard and Beilharz looked at the ability to predict adult behavior, particularly fearful behavior, in puppies to be trained as guide dogs (Goddard and Beilharz, 1983, 1984, 1985, 1986). While "excitement" or "inhibition" are considered important, their studies focused most often on fearfulness, the behavior they reported to correlate highest with failure to complete training. Their work, like that of Pfaffenberger et al. (1976), used puppies bred for guide dog use. They found that the most useful tests for assessment involve the puppy's reaction to a strange person, a strange dog, and certain unusual objects (Goddard and Beilharz, 1986). Their findings show that when the puppies are three months old there is some predictability of adult behavior and that this predictability increases with the age of the puppy (Goddard and Beilharz, 1984).

Others (Bartlett, 1979, 1985; Campbell, 1972) have designed puppy tests for companion dogs based on the evaluation of behavioral "tendencies" such as dominance and submission. However, some reports show that these tests have not proved to be good predictors of adult behavior when tested empirically (Beaudet et al., 1994; Young, 1988).

The use of dogs from pounds and animal shelters is still quite new in the service dog industry. This has presented a new problem to the selection process. These dogs can not be chosen using the tests of Pfaffenberger et al. or of Goddard and Beilharz because those tests were designed for use with puppies, while dogs chosen from shelters are usually between eight months and two years old. The selection tests used by agencies are based, at least in part, on Pfaffenberger's test, though most centers use a combination of tasks including observations of the dog's behavior in the cage, the dog's reaction to pain (usually a toe pinch), and the dog's reaction to new stimuli (e.g. an umbrella opening suddenly). Even with the use of a selection test, centers report a 40–60% failure rate. This failure rate was acceptable when compared to no selection test at all, but it would be much more advantageous to have a lower failure rate.

There are few studies of the predictability of behavior of dogs from a shelter or pound environment. One looked at the predictability of problem behavior of shelter animals adopted as companion animals, reporting that their test predicted 74.7% of the future behavior problems that the tested dogs displayed (Van der Borg et al., 1991). While this is encouraging, many of the dogs used in this study would never have been considered for service dog use. Dogs with overt behavioral problems, such as territorial aggression or extreme fear, are passed over by service dog trainers without testing.

The older age and accompanying maturity of shelter dogs might mean that with the correct test, behavior might be better predicted than in puppies bred specifically for the task. As indicated above, Goddard and Beilharz (1984) found that ability to predict adult fearfulness in a puppy increased as the age of the puppy increased. The greatest problem identified by service dog training centers is that the dog's overall behavior undergoes large changes, beginning approximately 3–4 weeks into the training process; more specifically, problems with both fearful behavior and some forms of aggression.

The problems faced by training centers in choosing dogs are related to the effectiveness of the selection tests being utilized. When the original puppy tests were first used they improved the selection process for dogs to be used by physically challenged people. Since then, there have been no further improvements on these tests. Changes in the

breeds used by training centers as well as changes in the population from which some dogs are chosen suggests a need to reassess the selection criteria.

In the present study we evaluated the selection tests currently used with shelter dogs. The dogs, from a local humane society, were administered a selection test, trained, and than evaluated on their ability to perform a service dog related task. The cost of training a service dog is quite high, and even though using a shelter dog reduces costs by eliminating breeding costs, and the volunteer hours and expenses of raising a puppy, housing and feeding costs quickly escalate when training is wasted on a dog that displays unwanted behavior after the beginning of training. By identifying problems that may exist in the current selection test, we hope to develop new and better ways to select dogs suitable for service work.

# 5. Method

## 5.1. Animals

The animals in this experiment were six male and three female dogs approximately 10 months to 2 years of age. Although the dogs were not pure breeds, only Labrador Retrievers, Golden Retrievers, and several types of shepherd and herding mixes were considered. The dogs were provided by and housed at the Humane Society of Wichita, Kansas. The dogs were housed in indoor/outdoor cages approximately 20 × 4 feet, and were isolated from other dogs kept in the shelter and from the public.

## 5.2. Procedure

*Phase 1 (selection)*: Each dog was individually administered an 11-item selection test compiled from commonly used selection tests (Table 1). The test was specifically designed to be administered once per dog while a trainer or handler is out at a shelter or pound. The dogs in these environments are often only available for three days, and trainers need to assess an animal quickly. Each test session was administered by the same person and videotaped for later analysis. The selection test required that certain tasks be performed in the dog's home cage and others in a novel area secluded from other dogs. Home cages were grouped together in two banks of 25 cages separated by a corridor 5 feet wide. The novel secluded test area, unfamiliar to the dogs, was a windowless visiting room at the Humane Society which was isolated from other dogs. The tester was experienced in working with dogs and was trained to handle the animals in a manner similar to that of assistance dog trainers. In order to avoid selection bias, dogs which were of suitable breeds (Labrador mixes, Golden Retriever mixes, Shepherd and other herding mixes) were selected for testing at random. An initial pass through the cages was made to eliminate animals that obviously would never have been chosen for service work, such as a dog that would not come in from its outside run, or one that cowered in its cage, or was overtly aggressive.

In many training facilities pass/fail is based not only on the number of components

Table 1
The selection test

| Test label | Handler's behavior and successful dog behavior |
| --- | --- |
| 1. Sideways approach | Crouch down at the side of the cage so that you are touching the cage, look in front of you, not at the dog. The dog should come up to you. |
| 2. Initial contact | Turn and face the dog. Talk softly and give eye contact, but do not stare. The dog should be friendly on the other side of the cage. |
| 3. Touch | Put your fingers though cage wire and touch the dog while looking towards the floor. The dog should be receptive to your touch. |
| 4. Approach to touch | Place your fingers through cage about 1 foot in front of the dog. The dog should move forward to your hand for contact. |
| 5. Stare | Open your eyes wide and stare at the dog, try to not let the dog break contact. The dog should look toward you and try to make friendly contact. |
| 6. Quick approach | While looking at the dog, make a sudden move forward. The dog might initially startle, but should then try to make friendly contact. |
| 7. Cage exit | In home cage place the leash on the dog and open cage door wide. Holding on to leash, back away from the door and allow the dog to exit. The dog should exit without hesitation. |
| 8. On leash behavior | Take the dog to a hallway away from the kennel area, but not completely secluded. Spend 5 min working on a controlled walk, correcting the dog for pulling on the leash by using a collar correction and using high praise. The dog should walk by the handler for the majority of the time, be friendly, and tolerate corrections. |
| 9. Room test | Take the dog to a quiet room away from other dogs. Sit on a chair and drop the leash. When the dog initially approaches pat it and speak quietly, but the majority of the time try to give as little stimulation as possible (i.e. sit quietly in chair and look at dog peripherally). This exercise should continue for 5 min. The dog should spend at least 65% of its time by the handler. |
| 10. Umbrella test | Drop the leash and with a closed umbrella stand in front of the dog and open it. Place the opened umbrella on the floor on its side. The dog might initially startle, but should then calmly approach the open umbrella. |
| 11. Pinch test | Kneel on the floor in front of the dog. You should be looking at head but not staring into the dog's eyes. Take the right front paw and pinch between the toes then release. The dog should be responsive to the pain without excessive submission or aggression. |

of the eleven item selection test the animal passes, but also on a subjective "feeling". We included a separate section for this subjective measure during the both selection and the final pass/fail evaluation. The number of test components failed (if any) were noted for all nine dogs, as was information about the dog's behavior between test components.

*Phase 2 (obedience training)*: All dogs tested during phase 1 were obedience trained by one of the authors (EW). Obedience training was conducted using the Volhard method (Volhard and Volhard, 1992), which involves positive reinforcement (high praise), negative reinforcement (ignoring the animal, and chain collar corrections until the desired behavior is performed), and punishment (chain collar corrections or "time-outs"). Ignoring a dog can be considered an aversive stimuli because dogs will not just work for attention, but will actively avoid being ignored. Training included basic commands required to teach the specific tasks: "No," "Sit," "Stay," "Stand," "Come," "Down," "Heel," "Off," "Leave it," "Quiet." Completion of the obedience phase was determined by the dog's ability to respond correctly 75% of the time to the first verbal command. This criterion is slightly higher than that used in other task studies (Young, 1988) because this phase has a lower level of learning difficulty compared to other studies.

*Phase 3 (retrieval training)*: In this phase dogs were trained to retrieve a retrieval dumbbell from the ground and give it to the trainer. This was taught using the Volhard motivational retrieval method (Volhard and Volhard, 1992). This method uses a positive reinforcer of food which is not used in the basic obedience training (phase 1) but is otherwise similar. The criterion for completion was 70% correct responses using one command and one correction (if necessary) in the familiar training environment of the Humane Society's training area (homebase).

*Phase 4 (evaluation)*: Prior to evaluation testing each animal received obedience practice for 2 min. Retrieval task performance was evaluated in five situations which were chosen to reflect real-life situations: (1) in the homebase situation with no distractions present; (2) in the homebase situation with an adult stranger present; (3) out-of-doors at the Humane Society with other barking dogs present; (4) at a public gas station a short car ride away from the Humane Society with an adult stranger present; and (5) inside in an unfamiliar room at the Humane Society with a loud abrupt noise administered during testing (i.e. a large book dropped by an assistant). The dogs were leashed in all situations. All situations were videotaped for later analysis. Evaluation of a dog's performance included (1) its completion of the task, i.e. successful retrieval; (2) the number of commands and corrections needed for completion of the task; (3) time needed for the completion of the task; and (4) observations of the animal's response to distracters.

The actions each dog exhibited in both phases 1 and 4 were videotaped and analyzed by three separate observers (the two assistants who conducted the selection tests and the experimenter/trainer) who were blind to the others' evaluation of the behaviors. Prior to analyzing the tape, the three observers trained together in order to establish a high inter-observer reliability. A professional external trainer was available if the observers did not agree on a behavior. However, the external source was never required. Because a few of the actions were either not clearly seen on the tape, or not captured at all, the three observers met together to discuss the actions performed in those cases.

## 6. Results

Table 2 shows the results of the dogs' performance on the selection test (phase 1) and on the final tasks (phase 4). Ranked correlation coefficients ($r_s$) were calculated between phase 1 and phase 4 performance. The correlation between selection test (phase 1) items failed and the number of final tasks (phase 4) not completed was not significant (Table 3). In addition, there was no significant correlation between selection test performance and corrections needed during phase 4 testing. Table 3 also includes our subjective evaluation of whether the dog performed as a service dog should. This was included because service centers sometimes use subjective feelings as a guide to choosing the right dogs.

It is generally agreed that to be a successful service animal, a dog should exhibit low to moderate levels of four categories of behavior: attention and distraction (A/D), excitement (E), fear and submission (F/S), and dominance (D). Examples of behaviors included in these categories are: F/S, the dog displays submissive behavior including crouching, submissive urination, shoulder roll (the dog moves from walking in an upright position to scooting forward and rolling down onto its shoulder), or a prolonged startle or fear response to a strong stimulus (such as a loud noise or a strong correction); A/D, the dog's attention should be on the handler. Some distraction being normal we

Table 2
Comparison of selection test performance and final task performance

| Phase 1 (selection test) | | | Phase 4 (final task) | | |
|---|---|---|---|---|---|
| Dog | Number of test items failed/test item numbers | Overall subjective performance | Number tasks completed | Number of Corrections | Overall subjective performance |
| 1 | 0 | Excellent | All | 2 | Excellent |
| 2 | 2/5, 8 | Poor | * | * | Poor |
| 3 | 1/9 | Questionable | All | 6 | Excellent |
| 4 | 2/8, 11 | Poor | 4 | 28 | Questionable |
| 5 | 2/5, 9 | Poor | All | 2 | Excellent |
| 6 | 1/8 | Good | 3 | 41 | Poor |
| 7 | 0 | Excellent | a | a | Poor |
| 8 | 2/8, 10 | Poor | All | 18 | Good |
| 9 | 0 | Excellent | All | 8 | Excellent |

[a] Dog did not complete training phases 2 or 3 due to behavioral problems.

Table 3
Correlation coefficient ($r_s$) of overall behavior and individual behaviors between phases 1 and 4

| | |
|---|---|
| Phase 1 versus phase 4 | 0.181 |
| Phase 1 versus corrections during phase 4 | 0.210 |
| Excitement | 0.357 |
| Dominance | −0.125 |
| Attention/distraction | 0.00 |
| Fear/submission | 1.00 |

Table 4
Negative behaviors displayed by individual dogs: A/D (attention/distraction); F/S (fear/submission); E (excitement); D (dominance).

| Dog | Phase 1 behavior (test no.) | Phase 4 behavior (task no.) |
|---|---|---|
| 1 | a | a |
| 2 | E(5); F/S(10) | Unable to complete phase 2 high E, F/S, A/D |
| 3 | A/D(9) | a |
| 4 | D(8); F/S/(10) | F/S(2), F/S, A/D(3); A/D(5) |
| 5 | E(5); A/D(9) | a |
| 6 | A/D(8) | A/D(4); A/D(5) |
| 7 | a | Unable to complete phase 2 high D, E |
| 8 | F/S(8); F/S(10) | A/D, F/S(4); A/D, F/S(5) |
| 9 | a | a |

[a] Indicates that the dog did not demonstrate any negative behaviors during that phase.

allowed two corrections for this behavior in each final task; D B, dominance behavior includes a dog placing its front paws on the handler, mounting behavior, otherwise placing its body above the handler, or growling while making eye contact; E, all dogs show a level of excitement, but a high level can be indicated by a steady high level of jumping, pawing, barking, etc.

Table 4 shows the negative behaviors displayed by individual dogs during phases 1 and 4, as well as the reasons for a dog's failure to pass the training phase of the project. For example, dog 7, the dog judged most difficult to handle and train as a result of high levels of excitement and dominance, did not display any negative behavior during phase 1. It is worth noting that all dogs displaying high levels of F/S during phase one also did so on the final task (dogs 2, 4 and 8), while all dogs that did not display F/S during phase 1 did not do so on the final task. Fear and submission are the only selection test behaviors that predicted later performance (Table 3). These analyses indicate that selection test performance may be a poor predictor of overall final task performance. While our results are suggestive, the small sample size necessitates further examination, which we are currently undertaking.

## 7. Discussion and conclusions

The results of our study provide empirical verification of anecdotal information from service dog training centers that the components of the currently used selection test are poor predictors of training success. Overall, the performance of the dogs during the selection test were not consistent with behavior that they later displayed. Our results not only demonstrate the possibility that the test is not sufficiently sensitive, but also may reflect the differences in environment between dogs raised in a home or laboratory setting and various environments encountered by dogs found in a shelter or pound.

The amount of stress experienced by dogs in a shelter environment may be quite high. Kennel cough is very common, as are various other easily transmitted illnesses. Stressors include very high noise levels, an unusual environment, new food, and many

visitors passing by their cages each day. These stressors add to the difficulty of predicting both problem and desirable behaviors because the dogs are less likely to react in a "normal" fashion to some of the novel stimuli presented during testing.

For example, selection test 6 requires the experimenter to make a sudden move forward while the dog is in its cage. On a daily basis many people pass by the dogs, often times stopping to play or talk to the dogs; children are often observed jumping or yelling in front of the cages. It is possible that the dogs are habituated to sudden movements by people in front of their cages. Test 8 evaluates the dog's ability to walk on a leash as well as its tendency to walk in close proximity to the handler. We found that dogs which had originally walked near the handler while on the leash did not later, and some dogs who had not walked in close proximity to the handler during selection did so later. This might be explained by the fact that the dogs rarely, if ever, get walked on a leash while in the shelter, as well as the high stress involved in living in the shelter environment. Several service dog training centers that use shelter dogs communicated to us that the dogs that they choose often changed their behavior after being away from the shelter environment for a few weeks. Therefore, although the test measures might be effective for dogs tested in a low stress environment, the stress in the shelter might have a strong effect on the test's sensitivity.

Overall, the selection test was not a good predictor of behavior, but it was successful at predicting the behavior category of fear/submission. All dogs that displayed this behavior in the selection test also did so in the final task (and, as in the case of dog 2, during training). Further, dogs that did not display fear/submission during selection did not display the behavior later. The dogs that displayed fear/submission during selection had strong responses, for example, staying several feet back from the umbrella while in a submissive posture, or never orienting their eyes towards the umbrella, or lying down and yelping while on the leash. These responses were the most prominent of all the misbehavior responses we saw over the course of selection.

Selection test item 10 was most powerful in eliciting a fear response. This test involved a very strong stimulus of an umbrella being opened abruptly directly in front of the dog. The handler did not make any contact with the dog during this test. After the umbrella was opened the handler placed it on the floor and stood still with her hands at her sides. The dog's behavior was therefore not influenced by the handler in the same way as it is was in some of the other test measures. The more objective test might be part of the reason that it was more powerful than some of the others.

While conducting this research we noted many behavior problems that arose during training that had not been visible during selection, and, in one case, was not visible until the final task. During the selection test, dog 9 was friendly, active, not fearful, and passed all the tasks easily. He was easy to train, had a high motivation for praise, and quickly learned the obedience and retrieval commands. However, during both parts of the final task which required the presence of a stranger (who was the same male for all dogs), this dog was distracted by the stranger, and even barked at him. It is important to note that this dog completed the task with only one correction; nevertheless, the behavior made us aware that a fifth category might need to be added. During most of the training, the dogs were exposed more to females than to males. The primary trainer and caretakers were all women, as were the experimenters who conducted the selection test.

We did not have an opportunity during selection to see how the dogs would react to males.

Given our small sample size we are next undertaking a systematic replication of this project. Further studies are needed to assess the effectiveness of the selection test on dogs exposed to lower levels of stress. The selection test might prove to be effective for choosing an adult pet, or even a service dog, from a home environment. This study suggests a next step which is to begin to find components that are better predictors of future behaviors in dogs obtained from a shelter environment. These animals, our study showed, often do not display either undesirable or desirable behaviors during the initial selection process. In only four out of the 11 test components was any undesirable behavior observed.

Goddard and Beilharz (1984, 1985) have found a few test components that are effective in predicting fearfulness and agonistic behavior in dogs. Their components are not currently in mainstream use in training centers in the United States. Others (Beaudet et al., 1994; Martinek, 1972; Van der Borg et al., 1991) have also found some test components that have been marginally successful in predicting some problem behaviors in dogs. For example, both Beaudet et al. (1994) and Martinek (1972) have found that activity levels in novel situations add to the predictability of behavior. Using these tests component, as well as test components put together by our research group, we will attempt to devise a selection test that can better predict behavior in shelter dogs.

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