SHELTER DOG TEMPERAMENT AND ITS INFLUENCE ON LEARNING OF BASIC COMMANDS AND ADOPTION RATE¹

EL TEMPERAMENTO DEL PERRO DE REFUGIO Y SU INFLUENCIA EN EL APRENDIZAJE DE LAS COMANDOS BÁSICAS Y LA TASA DE ADOPCIÓN

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¹ Luciana do Amaral Gurgel Galeb – Imaculada da Conceição street, 1155, Prado Velho – Zipcode: 80215-901 – Curitiba (Paraná), Brazil – E-mail: lucianagaleb@hotmail.com. Conflicts of interest: The authors declare that there are no conflicts of interest. Funding: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) and Pontifícia Universidade Católica do Paraná (PUCPR) for financial and professional assistance. "Este artigo é resultado de pesquisas desenvolvidas pelo Grupo de Pesquisa em Bem-Estar Animal, vinculado ao Programa de Pós Graduação em Ciência Animal da Pontifícia Universidade Católica do Paraná. Para atender aos princípios éticos o estudo detém aprovação do CEUA/PUCPR (n. 01129).
El objetivo de este artículo fue verificar la influencia del temperamento de perros rescatados en el aprendizaje de comandos básicos y tasas de adopción. Se evaluaron 30 perros. Los datos de temperamento se recopilaron utilizando el método de muestreo focal de animales en tres entornos diferentes. También se aplicó una selección de 7 elementos de comando de entrenamiento a las tareas básicas de obediencia y recuperación para mejorar el rendimiento individual general de los perros con el tiempo. Se utilizó el análisis de componentes principales seguido del coeficiente de correlación de Spearman para analizar las puntuaciones de temperamento de los perros en cuanto a la tasa de adopción y el tiempo que les tomó a los perros aprender cada comando de entrenamiento. Acostarse se correlacionó positivamente con la permanencia (r=0,4, p<0,02), patear (r=0,5, p<0,002) y gatear (r=0,4, p<0,009). La tasa de adopción se correlacionó negativamente con acostarse (r=-0,54, p<0,02), quedarse quieto (r=-0,8, p<0,03) y gatear (r=-0,8 p<0,05). El tiempo que les tomó a los perros aprender comandos de entrenamiento específicos fue un indicador importante que reflejaba su temperamento e influyó en la tasa de adopción.

Palabras clave

ABSTRACT
This article's objective was to verify the influence of rescued dogs' temperament on basic commands learning and adoption rates. Thus, 30 dogs were evaluated. Temperament data was collected employing the focal animal sampling method in three different environments. A 7-item selection of training commands was also applied in both basic obedience and retrieval tasks to improve dogs' overall individual performance over time. The principal component analysis followed by Spearman's correlation coefficient was used to analyze dog temperament scores for the adoption rate and the time dogs took to learn each training command. Lay down was positively
correlated with stay ($r=0.4$, $p<0.02$), paw give ($r=0.5$, $p<0.002$) and crawl ($r=0.4$, $p<0.009$). Adoption rate was negatively correlated with lay down ($r=-0.54$, $p<0.02$), stay ($r=-0.8$, $p<0.03$) and crawl ($r=-0.8$ $p<0.05$). The time dogs took to learn specifics training commands was an important indicator that reflects their temperament and influences the adoption rate.

**Keywords**


**Introduction**

Annually, dog shelters admit many dogs with different backgrounds: neglect, abuse, mistreatment, sickness, injury, abandonment, or those who lived on the streets. This life history affects a dog’s ability to cope with different environments, including social ones, which can difficult the bond dogs form with humans\(^1\).

In dog shelters, research is far more likely to study dog behavior that directly affects humans, such as aggression, often not considering the dog’s behavior as fear\(^2,3,4\). Specific studies that address individual dog behavior highlighting the temperament characteristics have been with few scientific approaches\(^5,6,7,8,9\).

Temperament has been defined as an animal’s response to novel or challenging situations\(^10\) that stabilizes with time, defining the dog’s characteristics\(^9\). Temperament modulates animal behavior and directly affects the degree to which it gets stressed in the presence of conspecifics and human beings. However, it is well-known\(^11,12,13\) that temperament also can be modulated by environment manipulations, which, depending on the intensity of the interference, can also result in permanent modifications of dog behavior. Depending on a dog’s characteristic temperament, it will have little guarantee of shelters’ positive outcomes, mainly related to adoption opportunity.

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This may be reflected in the shelter statistics, decreasing the higher percentages of abandonment, returns, and euthanasia by behavior problems\(^\text{14}\). It even has been reported that dog behavior is much more important as a potential adopter's attention point than a dog's physical appearance\(^\text{15}\). Thus, understanding, identifying, and applying techniques to modulate the shelter dog’s temperament could be the key to identify suitable strategies to deal with the problem. Hence, in shelters, a dog’s temperament has become an issue of great interest\(^\text{16,17,18}\).

Dog temperament evaluation was mainly applied to assess timely behavior information such as aggression level, fear, agitation, and socialization. Nevertheless, it may also be useful to identify specific and individual dogs’ patterns to apply the corrective measure or minimize behavior problems. A study\(^\text{19}\) demonstrated that shelter dogs, when adopted as companion animals, displayed behavior problems that could be predicted by temperament tests in 74.7% of the cases.

Thus, providing an increase of positive dog-human contact could make shelter dogs behaviourally more attractive for adoption, and at the same time, increase their welfare\(^\text{20,21}\). Many different techniques to improve a dog’s sociability were applied in shelters\(^\text{22,23,24}\), aiming for an increase in adoption rate.

Most of the training methods use the operant condition to stimulate the dog’s responses to the instructions, with reward reinforcers28. This technique is useful in training dogs to perform basic obedience commands and is also an easy task to follow dog learning evolution30. In the shelter context, the training acts as an attractive tool for dog socialization, facilitating the behavior control of unruly or excitable dogs31. It could also increase dogs’ controllability of the environment, making them deal better with stressful situations, preparing them for new environment exposure as a new home28.

Therefore, this study aimed to evaluate if (1) different individual temperament scores, and (2) a basic obedience training program in shelters influenced dogs’ adoption rates.

Material and methods

This study was approved by Pontifícia Universidade Católica do Paraná – PUCPR in the Animal Research Ethics Committee (CEUA), under protocol number 01129.

2.1 Animals

Thirty sterilized dogs, 17 females and 13 males, of different breeds and ages (1-5 years), who lived in a care University unit at PUCPR in the city of Curitiba, Paraná – Brazil, were selected among a pool of 81 dogs. We use the following selection criteria: length of shelter stay (minimum one year) and health conditions. Unhealthy animals were excluded. The backgrounds of any of the 30 selected animals were known in detail, but they can be described as abandoned or stray dogs. All dogs were medium size and weighed between 10 and 25 Kg.

2.2 Housing

PUCPR care unit is a long-standing dog shelter located adjacent to the Veterinary Hospital of the University. A building was adapted to house abandoned dogs on campus or those that appear across the campus attracted by the constant veterinary students' movement and food supply.

The University shelter had a structure similar to that of most Brazilian shelters, with indoor and outdoor chain-link, fenced kennels that allow dogs to see each other, and pens positioned side by side. The pens' size was approximately 180 m² each, with concrete flooring in indoor areas and grass outside. Generally, all pens were occupied by nine dogs and had a bed pallet structure with some cardboard or blankets on top (Figure 1).

![Figure 1](image)

University shelter pen design and structure.
Source: Prepared by the authors.

2.3 Handling and management practices

Because it is a University shelter, the dog’s handling and management practices have some differences. They are fed twice a day with pelleted feed, water replaced, and pen cleaned by five different staff members (alternating workdays), not explicitly hired for this purpose, but they also perform other routine University activities. Dogs are regularly visited during the day by several students around the Veterinary Hospital on weekdays. On weekends, feeding and water replenishment are only performed once a day, and human contact is limited to this specific one-off visit.

Before this study, dogs did not go on routine walks outside shelter areas. They remained mostly confined to their pens. In 5 months, dog socialization and
entertainment programs were implemented at the University with collaboration from active veterinary students. A basic command training routine was implemented three days a week, and 7-item training commands were selected involving basic obedience and retrieval tasks.

2.4 Dog’s basic command training

Each dog was trained using operant conditioning methods with positive reinforcement (food) in a group training session; it took place in an open-fenced field adjacent to the shelter. Thirty students participated during the five uninterrupted months of training, with one student assigned per dog.

In all sessions, students were always accompanied and under the guidance of a canine ethology expert. Each session took place on three different days (Mondays, Wednesdays, and Fridays) with a minimum of 2-hour duration. The seven basic command exercises were applied: sit, lay down, stay, paw give, roll, crawl, and walk on a leash, and all have been taught since the first training session. However, it is noteworthy that some commands are interdependent on others.

The dogs were individually observed over the training sessions in order to verify the effective learning of animals in the seven basic command exercises. It was considered that the dog effectively learned the command when at the end of each session, it correctly performed the command in three subsequent attempts and was able to remember and perform it correctly in the next session. For the walk on leash command, it was only considered that learning was effective when the dog walked alongside its student tutor without making sudden pulls, setbacks, or stops during a 5-minute observation. The technique used to teach each command is described in Table 1.
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sit</td>
<td>The treat was held in front of the dog’s nose, moving it back over its head. If the dog followed the treat and sat down, it was rewarded.</td>
</tr>
<tr>
<td>Lay down</td>
<td>The treat was held in front of the dog’s nose while moving to the floor. The student also assists the movement pointing to the floor with their other hand. When the dog leaned its belly on the floor, it was rewarded.</td>
</tr>
<tr>
<td>Stay</td>
<td>Followed by the sit command, the stay was applied, showing the animal's treat with one hand, and positioning the other hand in front of the dog’s nose as a stop sign. If the dog remains in the same place while the trainer moves away by three steps of distance, the dog is rewarded.</td>
</tr>
<tr>
<td>Paw give</td>
<td>Treat was continuously held in front of the dog’s nose, and the trainer, with the other hand, touches the animal's paw encouraging him to lift it. When the dog voluntarily raises its paw, it is rewarded.</td>
</tr>
<tr>
<td>Roll</td>
<td>Followed by the lay down command, the roll was performed, moving the treat from right to left first and making an imaginary circle with the treat hand after. Simultaneously, the trainer gently forces the animal's palette to follow the movement with the other hand. Because it was a more complex command, the reward happened at two central moments: when the dog performed the lateral positioning and when it finished rolling.</td>
</tr>
<tr>
<td>Crawl</td>
<td>Followed by the lay down command, the crawl was applied by showing the treat to the animal and dragging it over the floor. If the dog followed the treat and initiated the walking movement, keeping the body in a lying position, it is rewarded.</td>
</tr>
<tr>
<td>Walk on leash</td>
<td>Dogs were enticed with a treat to put their head through the leash collar progressively. Once they accepted the collar, the dogs were encouraged to walk side-by-side with the trainer. A correct walk on the leash was considered when there was no pulling the animal (forward or backward). This was achieved by either stopping when the pulling movement occurred and waiting until the dog stopped pulling. Pulling the dog back to the correct position and loosening the leash when the movement is respected were also permissive.</td>
</tr>
</tbody>
</table>

Table 1  
Description of dog command teaching steps.  
Source: Prepared by the authors.

2.5 Temperament tests

Temperament was the first behavioral data collected before starting the basic command training sessions with veterinary student collaboration. Temperament data was gathered using the focal sampling method in three different manners: a) taking the dog individually outside its pen for a walk on a leash; b) at an isolated pen, just with observer presence, and c) in the shelter pen with the presence of familiar dogs. In each environment, the dog’s behavior was observed for 10 minutes.
After the three sequential observations (30-min per dog), the evaluator uses a check sheet, recording the intensity of the predetermined behavior patterns occurrence (Table 2) of one dog through four possible scores: 0-absent; 1-low; 2-moderate; 3-high. The ethogram used in this research was based on previous dog behavior descriptions\textsuperscript{32,33,34,35,36}.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excitability</td>
<td>Unrest, walking, trotting, galloping, running, jumping on the roof, scratching the door, barking, whining, grumbling.</td>
</tr>
<tr>
<td>Aggressiveness towards people</td>
<td>Growling, transverse glance, fur-raising, lip curling, showing teeth, dashing at bars, keeping a distance from the test people, staring, rigid body posture.</td>
</tr>
<tr>
<td>Aggressiveness toward dogs</td>
<td>Growling, transverse glance, fur-raising, lip curling, showing teeth, keeping eyes fixed on other approaching dogs.</td>
</tr>
<tr>
<td>Sociability towards humans</td>
<td>Waving tail, approaching and even touching observer, accepting being cuddled, inviting to play.</td>
</tr>
<tr>
<td>Sociability towards other dogs</td>
<td>Waving tail, leaning on a dog, social grooming, inviting to play, sniffing dog, anogenital sniffing, anogenital licking, playing, inviting to play, answering an invitation to play.</td>
</tr>
<tr>
<td>Environment attentiveness</td>
<td>Smelling the floor, exploring, looking outside, nose upward sniffing different odors, looking carefully at the environment, looking at the observer, raising foreleg (for males).</td>
</tr>
<tr>
<td>Dominance towards humans</td>
<td>Staring, tail still, tail high, waving high tail, jumping upon the observer, upright, not head off, not shunt.</td>
</tr>
<tr>
<td>Dominance towards other dogs</td>
<td>Staring, tail still, tail high, waving high tail, mounting, upright, not head off, not shunt, have access to the best pen features.</td>
</tr>
</tbody>
</table>

Table 2
Behavioral categories selected for temperament tests.
Source: Prepared by the authors.


2.6 Dog’s adoption program

All the 30-dogs of this study were taken to continuous adoption fairs (for three consecutive months), on Saturdays, which is carried out in a large pet-shop in Curitiba-PR. The dog’s adoption also happened effectively by the students contacting people (e.i. friends and family contacts). At the end of three months of campaigning, we calculated the adoption rate (successful or unsuccessful), and the remaining unadopted stayed under the University shelter care.

To attract and encourage adoption, dogs in this study passed through a monthly veterinarian visit (3-consecutive months) in order to assist the dogs’ new home adaptation; with 90 days of free veterinarian attendance; were dewormed; vaccinated; microchipped, and the tutor received 1 Kg of dry food and one wet food sachet.

2.7 Statistical analysis

All statistical analyses were performed on SPSS software, version 14.0. Temperament data was determined by a normed Principal Component Analysis (PCA), with varimax Kaiser normalization as a rotation method, with a minimum eigenvalue extraction. PCA described the relationship between the individual dog behavioral scores for each of the eight behavioral categories listed in Table 2, building a unique behavior score pattern for each dog, from vector directions (which go in the same direction or not), characterizing an individual typology.

Summarily, PCA combines all variables in a data matrix and identifies associations among them, which generates indexes called principal components (eigenvalues) that describe the variation present in the data (Manly, 2008). The individual dog scores are represented in the two first factors, determined in this study as factor 1 – “aggressiveness/relationship” and factor 2 – “activity/exploration.” General Linear Model (GLM) followed by Sperman was used to test the association among the factors pointed out by PCA, dog weight, age, and the number of weeks dogs took to learn the different commands. The GLM followed by Kendall tau-b was also used for correlating adoption rate since it is a dichotomous variable. All the training commands were also correlated among them and the adoption rate by Pearson’s test.

Results

The first principal component analysis (PCA) identified two primary factors with eigenvalues greater than 0.7, which explained 47.5% of the data set variation. Any correlation loadings of 0.70 or above are deemed relevant for each factor (Table 3; Figure 2). Furthermore, a high positive 1st-factor value characterized animals with aggressiveness and dominant temperament. A high positive 2nd-factor value indicates animals with excitability and environment attentiveness.

It must be pointed out that all the dogs demonstrated sociability towards people, and none exhibited aggressiveness toward people. Therefore, no data variability for these two variables was found, which made us omit these results in Table 3 and Figure
<table>
<thead>
<tr>
<th></th>
<th>1st Factor</th>
<th></th>
<th>2nd Factor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“aggressiveness/relationship”</td>
<td></td>
<td>“activity/exploration”</td>
<td></td>
</tr>
<tr>
<td>Excitability</td>
<td>0.038</td>
<td></td>
<td>0.938</td>
<td></td>
</tr>
<tr>
<td>Aggressiveness toward dogs</td>
<td><strong>0.906</strong></td>
<td></td>
<td>0.235</td>
<td></td>
</tr>
<tr>
<td>Sociability towards other dogs</td>
<td>-0.966</td>
<td></td>
<td>-0.093</td>
<td></td>
</tr>
<tr>
<td>Environment attentiveness</td>
<td>0.435</td>
<td></td>
<td><strong>0.746</strong></td>
<td></td>
</tr>
<tr>
<td>Dominance towards humans</td>
<td><strong>0.845</strong></td>
<td></td>
<td>0.193</td>
<td></td>
</tr>
<tr>
<td>Dominance towards other dogs</td>
<td><strong>0.860</strong></td>
<td></td>
<td>0.214</td>
<td></td>
</tr>
</tbody>
</table>

* The loadings of 0.70 or above are pointed out because of their relevance to the factor variable.

Table 3
Rotated Component Matrix of results from the PCA analysis.
Source: Prepared by the authors.

![Plot of Factor Loadings](image)

Figure 2
Factorial map of vector projection built by PCA combinations of the six significant behavioral categories, multiplied by a rescaling constant.
Source: Prepared by the authors.

Temperament factors were not statistically significant to a dog’s age, weight, adoption success, and neither the time dogs took to learn the different commands (Table 4). In total, all dogs pass through 24 two-hour training sessions.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation (r)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (n)</td>
<td>0.21</td>
<td>0.25</td>
</tr>
<tr>
<td>Weight (Kg)</td>
<td>-0.11</td>
<td>0.55</td>
</tr>
<tr>
<td>Adoption success (y/n)</td>
<td>-0.19</td>
<td>0.26</td>
</tr>
<tr>
<td>Sit (n*)</td>
<td>0.05</td>
<td>0.78</td>
</tr>
<tr>
<td>Lay Down (n*)</td>
<td>-0.15</td>
<td>0.39</td>
</tr>
<tr>
<td>Stay (n*)</td>
<td>-0.15</td>
<td>0.39</td>
</tr>
<tr>
<td>Paw give (n*)</td>
<td>-0.25</td>
<td>0.16</td>
</tr>
<tr>
<td>Roll (n*)</td>
<td>-0.27</td>
<td>0.13</td>
</tr>
<tr>
<td>Crawl (n*)</td>
<td>-0.24</td>
<td>0.18</td>
</tr>
<tr>
<td>Walk on leash (n*)</td>
<td>0.04</td>
<td>0.78</td>
</tr>
</tbody>
</table>

* Number of training sessions for dogs to learn the commands. General Linear Model (GLM) correlation was followed by Sperman to test the association between the dog’s temperament factors and their age and training commands. GLM followed by Kendall tau-b for correlation with the adoption success.

Table 4
Temperament factor correlation with the individual dog’s characteristics.
Source: Prepared by the authors.

Finally, different training commands were correlated and dog adoption success; thus, there was some correlation. Lay down command was positively correlated with stay, paw give and crawl. Roll command was positively correlated with paw give and crawl. Adoption rates were negatively correlated with lay down, stay, and crawl (Table 5).
<table>
<thead>
<tr>
<th>Command</th>
<th>Sit (R)</th>
<th>Lay down</th>
<th>Stay (p-value)</th>
<th>Paw give</th>
<th>Roll (p-value)</th>
<th>Crawl</th>
<th>Walk on leash</th>
<th>Adoption (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sit</td>
<td>0.33</td>
<td>0.10</td>
<td>0.25</td>
<td>0.18</td>
<td>0.17</td>
<td>0.01</td>
<td>-</td>
<td>-0.10</td>
</tr>
<tr>
<td>Lay down</td>
<td>0.07</td>
<td>0.58</td>
<td>0.18</td>
<td>0.33</td>
<td>0.36</td>
<td>0.93</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Stay</td>
<td>0.02</td>
<td>0.02</td>
<td>0.002</td>
<td>0.14</td>
<td>0.009</td>
<td>0.88</td>
<td>0.027</td>
<td></td>
</tr>
<tr>
<td>Paw give</td>
<td>0.18</td>
<td>0.02</td>
<td>0.46</td>
<td>0.43</td>
<td>0.50</td>
<td>0.26</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Roll</td>
<td>0.02</td>
<td>0.02</td>
<td>0.002</td>
<td>0.01</td>
<td>0.004</td>
<td>0.15</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>Crawl</td>
<td>0.36</td>
<td>0.009</td>
<td>0.004</td>
<td>0.002</td>
<td>0.004</td>
<td>0.06</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Walk on leash</td>
<td>0.01</td>
<td>0.02</td>
<td>-</td>
<td>0.26</td>
<td>-0.04</td>
<td>0.06</td>
<td>0.27</td>
<td></td>
</tr>
</tbody>
</table>

Variables correlated between themselves by Pearson's test. \( r = \) correlation.

Table 5

Training commands learning time correlated between themselves and adoption success.

Source: Prepared by the authors.

Discussion

Temperament tests standardized experimental situations where stimuli serve to elicit behavior that is statistically compared with other individuals in the same situations to classify the subject tested\(^{37}\). Temperament tests conducted in the thirty shelter dogs sought each dog's specific individual characteristics during a series of shorter tests. These measures were subjected to a principal component analysis (PCA) of eight shelter dog behavioral pattern evaluations that revealed two component factors that reflect behavioral patterns in dogs.

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Although the components identified in this study are consistent with past research when we compare the temperament PCA factors between the adoption rate, dog’s age, and weight, even between the basic command learning time, no statistical differences were found.

The temperament test used in this study assesses selected behavior characteristics from the dogs and measures each one’s intensity. A similar methodology, with few adaptations, was also made by other dog studies using adjective ratings (where the observer rates how strongly the adjective describes the dog), and applying the behavioral observations in different environments such as taking the dog for a walk, in an open arena, and at the dog’s familiar pen. The choice to use “rating” methodology or other types of behavioral measures to assess dog temperament has already been widely discussed, and one method is not considered better than the others.

However, these techniques are challenging to implement in shelters due to the difficulty in applying standardized dog behavioral tests to a sample of dogs that do not have a common origin. Weiss and Hepper\textsuperscript{51}, for example, verify the effectiveness of temperament tests for dogs from animal shelters, concluding that there was not only the possibility that the test utilized was not sufficiently sensitive, but also that it could have reflected the differences in environment between dogs and their various shelter environments.

Dowling-Guyer et al.\textsuperscript{52} mentioned that temperament test applied in shelters had, as a principal challenge, the restricted range of scenarios to which dogs are exposed, and those authors also highlighted the importance of including specific subtests which measure a dog’s trainability to make the behavior diagnosis more reliable. For this study, even observing the dogs in three different environments, the temperament test demonstrates no relation between adoption rates and the dog’s training ability. However, when we compare the training sub-tests, we can note an important correlation between adoption rate and training commands.

Seven different types of training obedience commands were used in this study, and the learning speed for each dog was used as a response variable. Nonetheless, this type of subtests reflects the dog’s cognitive ability to learn the command and the willingness to cooperate with humans\textsuperscript{53} also part of human-dog communication\textsuperscript{54}. This type of behavioral training that reports obedience was shown to be more effective using consistent positive rewards\textsuperscript{55,56,57} as a standardized stimulus and was widely applied\textsuperscript{58,59}.

\textsuperscript{54} Angel M. Elgier, Adriana Jakovcevic, Gabriela Barrera, Alba E. Mustaca and Mariana Bento\textsuperscript{s}ela, “Communication between domestic dogs (Canis familiaris) and humans: Dogs are good learners” Behavioural Processes Vol 81: (2009): 402-408.

Reward-based training increases the dog’s motivation and aptitude to learn more commands because it anticipates the rewards and increases its controllability of the environment with predictable outcomes, improving dog welfare\textsuperscript{60,61}. These techniques
imply that shelters can make the dogs more adoptable⁶², and it is practical in a real-life setting.

Our study findings suggest that shelter dog training may increase the adoption rate, especially when the dog can rapidly learn the most complex commands (lay down, stay, and crawl). This link may be related to the fact that training creates more opportunity for positive interactions with humans⁶³, and also making the environment more predictable and controllable for the dog, resulting in less stressful situations⁶⁴; thus, making it more attractive to a potential adopter. Hennessy et al.⁶⁵ reported similar results where dogs were exposed to a general training routine to ensure that they develop basic skills designed to ease the transition to a new home⁶⁶. It is also known that a prevalence of undesirable behavior in dogs had an association between attendance at obedience training classes, with significantly fewer behavior problems in dogs trained with reward techniques⁶⁷,⁶⁸,⁶⁹,⁷⁰.

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Several studies have looked at the potential relationship between training experiences and the prevalence of behavioral problems\textsuperscript{71,72,73,74}; however, few studies reported the effects of obedience training on the adoption rate of shelter dogs\textsuperscript{75}, and no study, training a variety of different behaviors, lists which specific commands were related to the adoption rate. In their study, Luescher and Medlock\textsuperscript{75} point out this challenge, mentioning that a multiplicity of trained behavior makes it difficult to pinpoint the exact behavior that was necessary and sufficient to increase adoptions.

Moreover, the association of 7-command learning was also correlated between them in this study. The lay down command was positively correlated with stay, paw give and crawl. Roll command was positively correlated with paw give and crawl, which implies a positive association (large values of lay down or roll tend to be associated with large values of paw give and crawl). The other command variable does not increase or decrease as the $p$-value was less than 0.05.

A positive association means that if a dog learns the lay down command, they will also learn the paw give and crawl commands as well. However, these correlated commands had low association values (less than 0.5), representing what was not learned at similar times.

**Conclusion**

This study demonstrated that the time dogs took to learn specific training commands was an essential indicator in increasing the dog adoption rate. Scoring the 30-min focal sampling observation of some well-defined behavior proved not to be an efficient method in reporting the real dog temperament in addition to not being related to the adoption rate. Student-volunteer assistance proved to be a practical way of implementing a training program at a university shelter dog as part of a service-learning course.


\textsuperscript{72} Eniko Kubinyi, József Topál, Ádám Miklósi and Vilmos Csányi, “Dogs \textit{(Canis familiaris)} learn from their owners via observation in a manipulation task” Journal of Comparative Psychology Vol 117: (2003): 156-165.


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References


Las opiniones, análisis y conclusiones del autor son de su responsabilidad y no necesariamente reflejan el pensamiento de la Revista Inclusiones.