

Animal Trainer

simulation of animal training based on positive reinforcement



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v 1.0

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1 About the game

Game *Animal Trainer* gives you an opportunity to train virtual animals. The principles you will learn are widely used by professional animal trainers all over the world. The principles work well with domestic as well as with wild animals. Playing the game can help you to train your own pets like professional trainers do.

2 How to train animals

2.1 Learn about positive reinforcement

Virtual animals in the game share several features with the real animals. They spontaneously perform various kinds of behaviors. You can observe the virtual animals and estimate how frequently they engage in each type of behavior. Later you can train them to change the frequencies of the behaviors or even teach them to perform new behaviors.

Real as well as the virtual animals remember what they did and what happened afterwards. Due to this ability they can associate their actions with the consequences and change their behavior accordingly. They increase frequency of a behavior which was followed by a “pleasant” outcome, e.g. delivery of food, and decrease frequency of a behavior which was followed by an “unpleasant” outcome, e.g. pain. This type of learning is called *operant conditioning*. It will be your main training tool in this game as it is the main training tool for training real animals.

Professional animal trainers prefer to use “pleasant” stimuli instead of “unpleasant” stimuli during training. They reinforce a desired behavior by giving positive stimuli to an animal as soon as possible after it has finished the desired behavior. This increases the probability of occurrence of the desired behavior in future. Such training is called *positive reinforcement* training and the “pleasant” stimuli are called *positive reinforcers*. This game does not allow you to punish the virtual animals. Therefore you will train them by positive reinforcement.

The positive reinforcement training is not a petrified, unchangeable training procedure. You can practice three ways of positive reinforcement training in this game – capturing behavior, shaping behavior and chaining behaviors.

2.2 Capture behavior

When you train an animal you should tell it what behavior you want it to do. One possibility is to wait until the animal spontaneously performs the desired action. When it happens, reward the animal soon after it has completed the action. If you repeat it several times then the animal will associate the behavior with the following reward and it will increase the frequency of the behavior. People use term *captured behavior* for spontaneous behavior reinforced in this way.

2.3 Shape behavior

Sometimes the desired behavior is so uncommon that the subject never exhibits it spontaneously. In this case you start to reward behaviors which are similar to the desired behavior and which spontaneously occur with reasonable frequency. As the training proceeds, you gradually increase your requirements for the animal. You cease to reinforce some behaviors as more similar behaviors to the desired behavior appear. By this way you shape animal's behavior until the desired behavior is achieved. This type of learning is called *shaping*.

Shaping can be viewed as a training consisting of several small steps. The animal learns a particular behavior on each step. The behavior learned at one step should be more similar to the desired behavior than the behavior learned on previous steps. It is important that the behaviors in two consecutive steps are only slightly different from each other. It makes the training easier for the animal. Because of it you can go fast through the training with minimum repetitions on each step and the animal learns with little effort.

Sometimes the animal gets confused during shaping. If this happened, it means the current step is too much different from the previous step. You should go one step back and start from there again. It is recommended to add one or more steps between the step the animal has mastered and the step the animal got confused. Do not overtrain any of the non-final behaviors during shaping.

2.4 Chain behaviors

If the desired behavior is complex and it can be split into a chain of "simpler" behaviors then it is recommended to train each "simpler" behavior separately. You either capture or shape the "simpler" behaviors. It is useful to start with the last behavior of the chain. After the animal learns it, add the immediately preceding behavior. Proceed in this way until the whole chain is mastered. If any behavior in the chain is not well learned then the whole chain breaks down and the animal will not execute it.

2.5 Bring behavior under stimulus control

If a subject executes a desired behavior with a high frequency then you may want to control the initiation of the behavior by a stimulus, e.g. by a verbal command. To achieve it, present the stimulus to the animal and reward the desired behavior only if it occurs shortly after the stimulus presentation. The animal will learn that the desired behavior leads to the reward only if it follows the stimulus. The stimulus is not a command which has to be unconditionally obeyed. It is rather a chance for the animal to get the reward by executing the desired behavior.

2.6 Learn about classical conditioning

The virtual animals in this game similarly to the real animals are capable of learning that one stimulus comes before or at the same time as another stimulus. For example, a particular sound may precede delivery of a food. An animal learns that the sound

means “the food is coming” and it will respond to the sound in a similar way as it responds to the food. This type of learning is called *classical conditioning*. You will use it when you use a bridge in the training (see Section 2.7).

2.7 Improve training by using a bridge

To be a successful animal trainer you should reward the desired behavior as soon as possible after the animal has completed the desired behavior. Short delay or even no delay between the behavior and the reward promotes formation of the correct association in the animal’s brain. If the delay is long then the association forms slower. Beside of it, the animal may performed several additional actions before being rewarded. The animal may become confused which action was rewarded.

It is not always possible to reward the animal immediately after it has finished the desired action. For example, if you train a sea lion to jump through a hoop located above its pool then you cannot reward it at the moment it is passing through the hoop. You have to wait until it lands into the water and begins to pay attention to you again. You can overcome this problem by using so called *bridge*.

The bridge is a salient stimulus usually of a short duration which does not occur naturally in the animal’s environment, e.g. a clicker, and which has been previously associated with a rewarding stimulus, e.g. a food. In our example of the sea lion jumping through the hoop you can reinforce the desired action by using the bridge at the very moment the sea lion is passing through the hoop, at the “top level” of the behavior. The bridge tells the animal this action is correct and you get the reward when you are ready to receive it.

2.8 Be aware of superstitious behavior

You can reward an animal independently of its actions, for example, every 10 seconds. Simply by chance the animal may get the reward after it has finished some particular behavior, e.g. a sequence of actions lasting approximately 10 seconds. If it happens a few times then the animal associates the behavior with the reward and it increases frequency of this behavior although this behavior has no causal relationship with the reward. Such behavior is called *superstitious behavior*. You may see superstitious behavior also in a situation when you are reinforcing a specific behavior and the animal repeatedly performs another behavior close in time with the desired behavior. Unintentionally you increase frequency of both behaviors although you reinforce only one of them. If you are lucky then you may see superstitious behavior also in the virtual animals in this game.

2.9 Avoid common errors

Your training success depends on several factors. To be a good animal trainer you have to develop training skills. This game can help you with it.

Proceed along small steps. Big steps may be unpassable for the animal.

Adopt the right speed of the training. Fast training may cause that the animal will not understand you. Slow training may cause that the animal will stop at some level and will not progress further or it can even forget what you have trained it.

If you are using a bridge then make sure that the animal understands that the bridge means “well done, for this you deserve reward”.

Use the bridge at the right moments. Wait until the desired behavior has been just completed or is “on its top”. If you use the bridge too early, the animal will think that the initial part of the action is rewarded and it will not complete the behavior in future. If you use it too late, you reinforce the behavior coming immediately after the desired one, e.g. in the case of the sea lion jumping through the hoop, the late usage of the bridge reinforces falling down after jump.

Animals want to achieve reward with minimum effort. For this reason they test whether there is a less demanding way to get it. They may start to fool the behavior. Therefore, keep your training goals firmly and do not reward incomplete behaviors.

2.10 Differences between real and the virtual animals

The virtual animals in the game are not real animals. Their behavior is simpler. It is easier to train them. You do not need to build confidence and positive relationship with them. You do not need to read their body language. They are never fed to satiety, never bored and thus they are always willing to cooperate. Despite of these differences, the basic principles of building new behaviors in this game are the same as with real animals.

If you train a real animal then do it gently and unambiguously. Do not expect that the real animal will understand you as quickly as the virtual animals in this game. You should clearly communicate your goals to the animal. Animal’s mistakes do not mean that the animal is dull but it does not understand you. Perhaps you did not take sufficient time to teach the animal the meaning of the clicker or you use the clicker too late or you have introduced a big step in the training or you force the animal to cooperate when it is not willing to.

The biggest mistake is to punish the animal for not understanding you. We are not saying that you should not correct a harmful behavior by a short and immediate reaction. However, it is always better to prevent the occurrence of such behavior. The animal should feel safe and should not to be afraid of making mistakes during the training. If the animal understands that it can only gain from the training then it will like it. This is the main goal of the positive reinforcement training.

This game teaches you to use a bridge. The bridge can help you with the training. Once a real animal has mastered the task you don’t need to use the bridge any more. Similarly you don’t have to reward the animal every time it has finished a well learned behavior. To maintain an acquired behavior on the best level with the least amount of reward, it is recommended to use an intermittent schedule of reinforcement. However, the different reinforcement schedules are beyond the scope of our game.

In many cases you can train real animals without a bridge.

3 How to play the game

3.1 Startup window

Section 2 (*How to train animals*) provides you the necessary knowledge for effective training of animals. Now you can practice it with the virtual animals in this game. Do not forget to carefully observe the animals and wait for the right moments at which you can communicate to the animals your training goals by giving them rewards or by using a bridge.

Start the game by executing file “AnimalTrainer.exe”. A startup window opens (Figure 1)

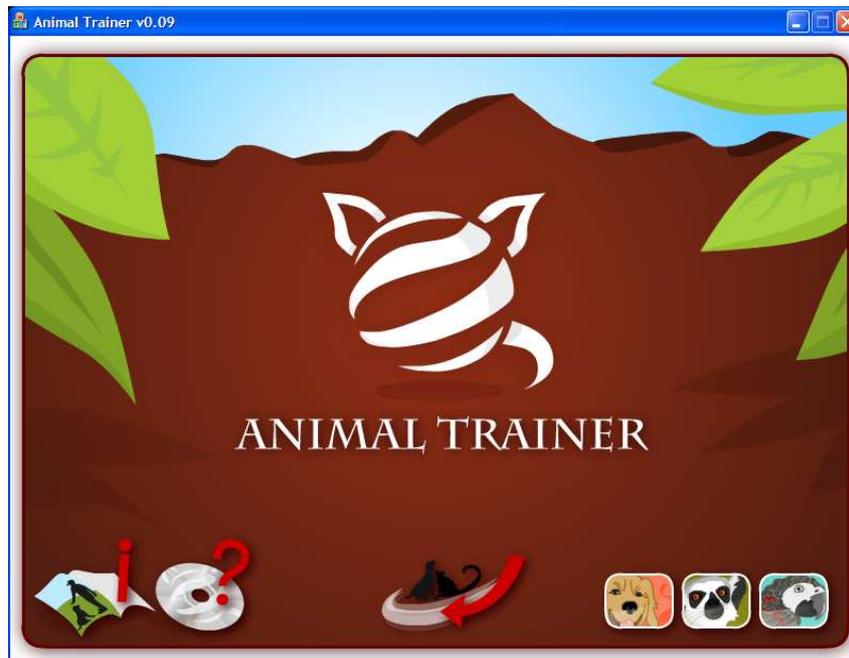


Figure 1: Startup window

There are three icons with animal pictures in the lower right corner of the startup window. Use them for selecting an animal you want to train. The options are a dog (shaping)  , a lemur (behavior chain)  and a parrot (capturing) .

The first click on any of the icons displays another icon right above the icon you have clicked on. You can choose an easier training by clicking on the lower icon or more difficult training but also more realistic one by clicking on the upper icon.

3.2 Training windows

After you have chosen an animal, a training window appears. This is the window where you interact with the animal. You can reward the animal, associate the reward with a clicker or perform additional actions specific for the chosen animal and for the desired behavior. An examples of training window is shown in Figure

2. The animal is in the center of the window. Buttons which execute your actions are along the right side. Since these buttons are specific for each animal and each type of desired behavior, they are described in the following sections. The button



located in the lower right corner of the training window returns you back to the startup window.

4 Play with a dog

4.1 Goal of the training

You can train dogs Quido (easier training) and Hugo (more difficult training) to wave one front leg after you say “PAC” (see video: *dog.mpeg*). You will use the shaping method described in Section 2.3 and then you bring the behavior under a stimulus control (Section 2.5). The stimulus is a verbal cue “PAC”. Since this is a difficult training, you can follow a training procedure recommended by a professional animal trainer (Section 4.4). Beside of it you can train the dog to bark or to wag its tail frequently. You achieve this by capturing the desired behavior (Section 2.2). You can also bring this behavior under verbal cue control (Section 2.5).

4.2 Start the training session

Click on the icon with a picture of a dog  in the right bottom part of the startup window (Figure 1). The click displays another icon with a dog right above the icon you have clicked on. To train Quido click on the lower icon. To train Hugo click on the upper icon. The startup window changes into Dog training window displayed in Figure 2.

4.3 Actions you can do

Click on the buttons along the right side of the training window to execute actions:



1 feed the dog,



2 use the clicker,



3 touch the dog's front leg,



4 put your hand close to the dog's front leg,



5 put your hand higher above the ground,



6 put your hand high above the dog,



Figure 2: Dog training window



say “PAC”,



save the learning state of the currently trained animal into a file,



load the learning state of a previously trained animal from a file.

Some of the buttons may get transiently gray. During this time you cannot use them.

You can return to the startup window by clicking on the icon  in the left bottom corner. Before you leave, the program asks you to confirm your decision.

4.4 Recommended training

You can think about a training procedure by yourself or you can follow instruction recommended by a professional animal trainer. The training is divided into a few steps. Repeat each step several times before moving to the next one. If you have problem to accomplish one step then take more time practicing the preceding step. Do not overtrain the animal on any of the steps.

1. **Associate the sound of the clicker with food.** Use the clicker  and then give the food . It is recommended to gradually prolong

the time between the clicker and the food. The clicker should tell the dog: “Food is coming!”

2. **Associate contact between your hand and dog’s leg with food.** Touch the dog’s front leg  , then use the clicker  and finally give the food  . Animals usually learn more than a pure association of two stimuli. In this case the dog may learn that the reinforced event is the touch between your hand and its leg. This can facilitate the initiation of dog’s movement in the next step.
3. **Reinforce dog’s movement to your hand.** Put your hand close to the dog’s leg  and wait. If the dog moves its leg and touches your hand then use the clicker  and give it the food  . The clicker means “Well done, right now you deserve reward.”
4. **Make the previous step more difficult.** Repeat the previous step with your hand positioned higher above the ground  . The dog should learn to lift its leg higher and touch your hand. If it does so then click  and give it the food  .
5. **Reinforce lifting up the dog’s leg without touching your hand.** Put your hand high above the dog  . The dog will attempt to lift up its leg in order to touch your hand. Use the clicker  and reward the dog  if the dog lifts its leg to the same height as in the previous step. The dog learns that the goal is to lift up its leg high, not to touch your hand. The clicker terminates the behavior before it has been completed. It works as so called *terminant bridge*. It tells the animal “this level of behavior is enough”. If you do not use the clicker then the dog starts to jump in order to touch your hand.
6. **Bring the behavior under a verbal cue control.** So far the dog’s behavior is controlled by your hand. When you put your hand above the dog, it lifts up its leg. Now use the verbal cue “PAC”  before you put your hand above the dog  . The dog will learn that the word “PAC” predicts the reward in the same way as your hand. The dog starts to respond to the word “PAC” because it shortens the time for getting the reward. Do not forget to click  and give the food  when the dog makes the correct response. If the dog learns this step then your training is finished and the program announces your success.

4.5 Suggestions

See what it happens if you repeatedly do not deliver food after the clicker.

Try to train the dog without the clicker.

Test how the training proceeds if you are making mistakes, e.g. you are not consistent in your demands or you miss some of the recommended training steps.

5 Play with a lemur

5.1 Goal of the training

You can train lemurs Emil (easier training) and Kamil (more difficult training) to enter into a transportation box and close the door behind it (see video: *lemur.mpeg*). The lemurs close the door by pulling down a string. A single downwards movement is not sufficient. The lemurs have to pull the string repeatedly hand by hand.

The desired behavior can be split into two “simpler” behaviors – entering into the transportation box and pulling down the string. Each behavior should be trained separately and then put together. Thus you face a behavior chain (Section 2.4). The training will consist of three parts:

Part 1: pulling the string hand by hand,

Part 2: entering into the transportation box,

Part 3: joining the two behaviors together.

You can follow a training procedure recommended by a professional animal trainer described individually for each part of the training (Sections 5.2.3, 5.3.3 and 5.4.3).

5.2 Part 1 – pulling the string hand by hand

5.2.1 Start the training session

Click on the icon with a picture of a lemur  in the right bottom part of the startup window (Figure 1). The click displays another icon with a lemur right above the icon you have clicked on. To train Emil click on the lower icon. To train Kamil click on the upper icon. The startup window will change into Lemur training window 1 (Figure 3) where you can train the second behavior of the behavior chain – pulling the string.

5.2.2 Actions you can do

Click on the buttons along the right side of the training window to execute actions:



feed the lemur,



use the clicker,



Figure 3: Lemur training window 1



hold the string in front of the lemur – hold your arm gently,



hold the string in front of the lemur – hold your arm firmly,



hold the string in front of the lemur – hold the string loosely in one hand and wave with the other hand,



save the learning state of the currently trained animal into a file,



load the learning state of a previously trained animal from a file.

Some of the buttons may transiently become gray. During this time you cannot use them.

There are three buttons with numbers in the lower left part of Lemur training window 1. They serve for selecting the behavior you want to train:



pulling down the string (default),



entering into the transportation box,



putting the two behaviors together.

These three buttons have the same function in other Lemur training windows (Lemur training windows 2 and 3).

Return to the startup window by clicking on icon  in the left bottom corner. Before you leave, the program asks you to confirm your decision.

5.2.3 Recommended training procedure

The training is divided into a few steps. Repeat each step several times before moving to the next one. If you have problem to accomplish one step then take more time practicing the preceding step. Do not overtrain the animal on any of the steps.

1. **Associate the sound of the clicker with food.** Use the clicker  and then give the food . It is recommended to gradually prolong the time between the clicker and the food. The clicker should tell the lemur: "Food is coming!"
2. **Reinforce the lemur for pulling the string with one hand.** When the lemur sits at the edge of the platform, hold the string in front of the lemur . It is important that your hand is far enough from the lemur so it can reach the string but not the food in your hand. After the lemur grasps the string and pulls it toward itself, use the clicker  and reward the lemur . Despite the lemur can learn this step without the clicker, it is recommended to use the clicker. You will take an advantage of it later. For a real animal, this step is natural. It has learned in the previous step that food is in your hand. Therefore, it pulls the string toward itself to bring your hand with the food to a reachable distance.
3. **Reinforce the lemur for pulling the string with both hands.** Repeat the previous step but hold your hand firmly . The lemur must use both hands to pull your hand toward itself. Use the clicker  and give the reward  if the lemur has used both hands.
4. **Reinforce the lemur for pulling the string hand by hand.** Hold the string loosely . The lemur attempts to move your hand toward itself. It grasps the string and starts pulling it. Since you hold the string loosely, it slips through your hand. The lemur will try to pull the string again and again, hand by hand. This is the behavior you want to reinforce. Indicate it by the clicker  followed by the food . The association between the clicker and the food built in the previous steps helps you here to communicate to the animal what you want – pulling the string

not your hand. You may notice that, while you are holding the string in front of the lemur, you are also waving with the other hand. By this, you are introducing a novel visual cue. This cue will help to initiate the behavior (pulling the string) without the necessity to hold the string in your hand. You will take an advantage of it later.

5.3 Part 2 – entering into the transportation box

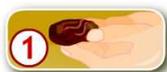
5.3.1 Start the training session

After you have finished the first part of the training (pulling the string), you can move to the second part (entering into the transportation box) by clicking on the button **2** in the lower left part of the lemur training window 1. Lemur training window 1 changes to Lemur training window 2 (Figure 4).



Figure 4: Lemur training window 2

5.3.2 Actions you can do



feed the lemur,



use the clicker,



put the transportation box on the platform – the grid back wall is removed from the box,



put the transportation box on the platform – the grid back wall is attached to the box,



remove the transportation box,



save the learning state of the currently trained animal into a file,



load the learning state of a previously trained animal from a file.

Some of the buttons may transiently become gray. During this time you cannot use them.

Return to the startup window by clicking on icon  in the left bottom corner. Before you leave, the program asks you to confirm your decision.

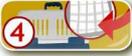
5.3.3 Recommended training procedure

The training is divided into a few steps. Repeat each step several times before moving to the next one. If you have problem to accomplish one step then take more time practicing the preceding step. Do not overtrain the animal on any of the steps.

1. **Reinforce the lemur for sitting on the place where you intend to put the transportation box in the following steps.** Wait until the lemur comes to the place where you intend to put the transportation box (the edge of the wooden platform). When it happens, click  and give it the reward . The lemur should learn that this is the feeding place.

2. **Reinforce the lemur for standing in front of the transportation box.** Put the transportation box on the platform with the back wall removed . When the lemur stands in front of the transportation box, use the clicker  and reward the lemur . You can skip this step and return to it only if you will have difficulty in accomplishing the next step.

3. **Reinforce the lemur for entering into the transportation box without the back wall.** Put the transportation box without the back wall on the platform . When the lemur enters into the transportation box, use the clicker  and reward the lemur . The lemur has a tendency to run through the transportation box. If it happens frequently then stop rewarding the lemur for entering into the box. Instead of it, reinforce the lemur only if it stays in the box. In this step, the lemur should learn that the transportation box is the feeding place. Remove the transportation box frequently. The lemur will learn that there is a short time window of opportunity for making the action.

4. Reinforce the lemur for entering into the transportation box with the back wall attached to the box. Put the transportation box with the grid back wall on the platform  . When the lemur enters into the transportation box and it stays there, use the clicker  and reward the lemur  to reinforce this behavior.

5.4 Part 3 – joining the behaviors into the behavior chain

5.4.1 Start the training session

After the lemur has learned both behaviors (pulling the string and entering into the transportation box) you can put them together into the behavior chain. Click on the button  in the lower left part of the lemur training window 2. Lemur training window 3 appears (Figure 5).



Figure 5: Lemur training window 3

5.4.2 Actions you can do



feed the lemur,



use the clicker,

-  put the transportation box on the platform – the back wall is opened but narrowed,
-  put the transportation box on the platform – the back grid wall is attached to the box,
-  put the transportation box on the platform – the front door hangs on a pulley,
-  hold the string at the edge of the platform,
-  hold the string between the edge of the platform and the transportation box,
-  hold the string near the transportation box,
-  do not hold the string, use the visual cue introduced in the last step of the training of pulling the string (Section 5.2.3),
-  save the learning state of the currently trained animal into a file,
-  load the learning state of a previously trained animal from a file.

Some of the buttons may transiently become gray. During this time you cannot use them.

Return to the startup window by clicking on icon  in the left bottom corner. Before you leave, the program asks you to confirm your decision.

5.4.3 Recommended training procedure

Putting the two behaviors from Sections 5.2.3 and 5.3.3 into a behavior chain is divided into a few training steps. Repeat each step several times before moving to the next one. If you have problem to accomplish one step then take more time practicing the preceding step. Do not overtrain the animal on any of the steps.

1. **Reinforce the lemur for passing through the transportation box and for pulling the string hand by hand.** Put the transportation box on the platform with back wall open  . Hold the string at the edge of the platform  . Wait until the lemur passes through the transportation box and pulls the string hand by hand at the edge of the platform. If the lemur does it then use the clicker  and reward it  . Notice that you trained the lemur to enter and to stay in the box in Section 5.3.3. Now you start with a simpler behavior. The lemur should go through the box. It is a common practice to release the training criteria in one of the two behaviors when you start to join them together. It facilitates the training.

2. **Repeat the previous step with your hand positioned between the edge of the platform and the transportation box.** Put the transportation box on the platform with the back wall open  . Hold the string between the edge of the platform and the transportation box  . Reward the lemur for passing through the transportation box and for pulling the string hand by hand. If the lemur does it then use the clicker  and reward it  .
3. **Repeat the previous step but hold your hand near the transportation box.** Put the transportation box on the platform with the back wall open  . Hold the string near the transportation box  . Wait until the lemur enters the transportation box and pulls the string hand by hand. At least the back part of the lemur's body should remain in the transportation box. If the lemur does it then use the clicker  and reward it  .
4. **Use the transportation box with the grid back wall attached.** Put the transportation box on the platform with the back wall attached  . Hold the string near the transportation box  . Wait until the lemur enters into the transportation box, puts its hand through the grid back wall and pulls the string hand by hand. If the lemur does it then use the clicker  and reward it  .
5. **Use the transportation box with the string hung on the pulley.** Put the transportation box on the platform with the back wall attached and with the string hung on a pulley  . Use the visual cue (waving your hand)  to initiate lemur's behavior (pulling the string). You introduced this cue in the last training step in Section 5.2.3 and you have used it, may be without your notice, in this phase. Wait until the lemur enters into the transportation box, puts its hand through the back grid wall and pulls the string hung on the pulley hand by hand. If the lemur does it then use the clicker  and reward it  .
6. **Complete the whole behavior chain.** Repeat the previous step. Put the transportation box on the platform  , however, gradually prolong the time between the moment of lemur's entrance into the box and the moment you present the visual cue  . The delay increases the likelihood that

the lemur starts to pull the string without the visual cue. The transportation box should be the only cue for initiating the whole behavior chain. If the lemur does it then use the clicker  and reward the lemur . The training of the whole behavior chain is successfully finished.

5.5 Notes and suggestions

Some of the above steps would be too much difficult for a real lemur. The difficulty would arise from the anxiety of the animal. The training of entering into the transportation box had to be divided into more steps. The same is true for training the lemur to put its hands through the grid of the back wall. The enclosure of the lemur in the box is tolerated well, however, the animal should have a possibility to freely leave the box in the beginning of the training.

Try to reverse the training of the behavioral chain. Train the lemur to enter into the transportation box and then to pull the string. Is there a difference?

Try to train the lemur without the clicker.

See what happens if you are making mistakes, e.g. if you are not consistent in your demands or you miss some of the recommended training steps.

Try to train the lemur to scratch itself on a cue.

6 Play with a parrot

6.1 Goal of the training

Parrots frequently learn words and sentences they hear. Two parrots in our game, Alex and Cyril, have already picked up three phrases – “Nemám chuť” (“I have no appetite”), “Naval burák” (“Give a peanut”) and “I feel good”. You can capture any of these phrases. The method of behavior capturing is described in Section 2.2. The parrot will then endlessly repeat the captured phrase. To avoid it, you should get the phrase under stimulus control (see Section 2.5). Parrot Alex is easier to train than parrot Cyril.

In the first part of the training you will practice to precisely time the clicker. In the second part of the training you will practice how to establish a cue for the parrot to bring its behavior under stimulus control. You can follow the recommended training procedure described in Section 6.4.

6.2 Start the training session

Click on the icon with a picture of a parrot  in the right bottom part of the startup window (Figure 1). The click displays another icon with a parrot right above the icon you have clicked on. To train Alex click on the lower icon. To train Cyril click on the upper icon. The startup window changes into Parrot training window displayed in Figure 6.



Figure 6: Parrot training window

6.3 Actions you can do

You can perform the following actions in the Parrot training window.



give a treat to the parrot,



use the clicker,



show a treat to the parrot,



ask “Jak se máš?” (“How are you?”),



ask “Tak co, kluku?” (“So what, boy?”),



save the learning state of the currently trained animal into a file,



load the learning state of a previously trained animal from a file.

You can return to the startup window by clicking on the icon  in the left bottom corner. Before you leave, the program asks you to confirm your decision.

6.4 Recommended training

Before you start decide which phrase you want to reinforce – “Nemám chuť” (“I have no appetite”), “Naval burák” (“Give a peanut”) and “I feel good” – and decide after which stimulus the parrot should say this phrase – show a treat to the parrot



, ask “Jak se máš?” (“How are you?”)



or ask “Tak co,

kluku?” (“So what, boy?”)  .

The training is divided into a few steps. Repeat each step several times before moving to the next one. If you have problem to accomplish one step then take more time practicing the preceding step. Do not overtrain the animal on any of the steps.

1. **Associate the sound of the clicker with the treat.** Use the clicker



and then give the treat to the parrot



. It is recommended to gradually prolong the time between the clicker and the treat. The clicker should tell the parrot: “Reward is coming!”

2. **Reinforce the chosen phrase.** Wait until the parrot spontaneously says

the chosen phrase. Then use the clicker 

and give the parrot the treat 

. Repeat it several times before moving to the next step. The parrot highly increase the frequency of saying the chosen phrase.

3. **Bring the behavior under stimulus control.** Probably you don’t want to listen to the chosen phrase over and over. To bring it under stimulus control, present the stimulus by which you want to control parrot’s behavior and wait,

e.g. 

. If the parrot says the desired phrase shortly after your action then use the clicker 

and reward the parrot  . Do not reward behavior which was not preceded by your stimulus. After several repetition the parrot will say the phrase only after you have performed the action. If you get so far then your training has finished.

6.5 Notes and suggestions

The bridge and its proper usage is important for behavior capturing. The parrot in our game must properly understand the meaning of the bridge which tells the animal “Well done”. Unlike food reward, the bridge can be used at the very moment at which the parrot has finished the phrase. The precise timing of the bridge is essential. If you use the bridge late then the parrot will not understand your request. If you use the clicker early then it will function as a terminant bridge. The animal will say only the part of the phrase which has been completed before you used the bridge.

The parrot may shorten the phrase even if you use the bridge properly. It is because the parrot wants to get the reward with minimum effort. If you reward the parrot for this incomplete behavior then it will further shorten the phrase. Therefore, be strict during the training.

It is possible that the parrot will perform an additional so called superstitious behavior to the phrase (see Section 2.8). For example, the parrot may be turning around. It is very likely that you have captured this behavior together with the phrase. Despite you are reinforcing only the phrase, the parrot has associated the combination of both behaviors with the reward. If you don't want the parrot to perform the additional behavior then go one step back and do not reward the animal if it is performing the additional behavior. It is difficult to unlearn such behavior after it has been fixed.

You can try to train the parrot to say all the three phrases in one training, each phrase after a different cue. For example, the parrot says "I feel good" after you ask "Jak se máš?", it says "Naval burák" after you ask "Tak co kluku?" and it says "Nemám chuť" after you show it the treat.

You can try to train the parrot without the clicker. See whether you succeed.

We wish you a good luck and a lot of fun with the virtual animals as well as with your own pets.