

HOW TO TRAIN A CHICKEN

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I. WHAT DO I NEED TO KNOW FIRST?

Foreword: About Chickens. The domestic chicken is an excellent teaching and demonstration animal. It is large enough to be visible at the front of a classroom or fair-sized meeting room. The chicken learns quickly (although WHAT it will learn is more limited than with dolphins, dogs, parrots, or crows). The chicken's movements are VERY quick; this makes it a good animal to use to show the importance of IMMEDIATE reinforcement -- if you aren't prompt, the bird will be doing something else. Because it moves quickly and eats quickly (no chewing!), you can get many responses and many trials during the course of a day. Both these features are very important for developing strong, accurate behavior. The bird is hardy, easy to care for, not as messy as some other species. The best chicken is a tame chicken: It is not necessary to raise them by hand nor imprint them, as with ducks and some other species, but you should select a breed that is not too excitable. A good appetite is also important.

A cross-bred (say Leghorn crossed with a heavy breed) usually makes a good subject, but avoid the really heavy broiler breeds -- they get too big and are too sluggish. Because of their tendency to put on fat, they tend to self-destruct at an early age. Bantam breeds are great, but select tame ones. They do not need to be hand-tame at first, but get the type that does not fly squawking in all directions as you approach the flock. YOUNG HENS (1 to 2 years or so) are the best. We DON'T recommend roosters -- they have their minds on other matters.



The chicken's vision is keen -- very much like ours. With these birds you can demonstrate color vision and fine pattern discriminations. Chickens do not "do" a lot in terms of motor behavior. They cannot manipulate objects well with their claws or beaks. You can condition claw movements, but are apt to wind up with "dancing" (the scratch pattern). This is a naturally strong behavior that is apt to come out vigorously in any food-getting situation, even if you have not been trying to condition foot movements.

Chickens are a little more versatile with their beaks, although there are only about four basic response patterns -- tugging or pulling, raking, pecking, and grabbing or picking up objects with the beak. As far as progressions are concerned, chickens walk, of course, run (basically a fast walk), and fly. At least banties (bantams -- small chickens, bred for their miniature size, from many common breeds) and light-weight active chickens tend to fly more readily. If you want to insist on a walk, without flying, you may have to specify this as part of your criterion and not reinforce flying sequences, or even wing flapping or the beginnings of flight. (We ran into this problem with one of our show acts -- the Tightrope Walking Chicken -- where it seemed to some of the chickens the most natural thing in the world to fly from one station to the next. In spite of this rather limited behavioral repertoire, it is amazing how many things you can develop and train from these rather few generic behaviors.

What is Meant by TRAINING? Training is the process of teaching a person or an animal to do something not known before, or how to do something better than before. We all have learned a lot in the "real world" before we receive any formal training; so do dogs and chickens. However, for special reasons, sometimes deliberate instruction is necessary. Dogs in an obedience class, students studying in a classroom, athletes "working out" in a gymnasium, apprentices under the watchful eye of a master, are all undergoing training. Whenever learning takes place deliberately, under the direction of a teacher or trainer, we call it training, teaching, or instruction.

When an animal is being trained, it is LEARNING. We all have had to learn to read, write, to tie our shoes, drive a car, and so many other things that we must do from day to day just to live. Learning is the process of changing behavior as the result of experience. As we have mentioned, learning can occur in the natural world -- a baby, or a young animal, learns to keep away from the fire because it has had the experience of discomfort. People and some animals can learn by watching the experiences of other people (or animals). Chickens cannot learn this way.

BEFORE YOU START TO TRAIN YOUR CHICKEN, please read the section on “Operant Conditioning – What Is It and How Does It Work?”

II. BEFORE YOU START TO TRAIN

A. Preliminary.

One of the outstanding achievements of behavior analysis, and applied operant conditioning particularly, is the speed and precision that it makes possible in the training process. Operant conditioning, coupled with a firm appreciation of the role that respondent conditioning takes in animals' lives, has made it possible to train animals that could not be trained with the old, conventional animal trainers' methods. Furthermore, animals that had been commonly trained, dogs, for example, can be trained much faster. In addition, their behavior, trained with operant conditioning, shows more reliability, spontaneity, and zest.

In order to take advantage of the possibilities that behavior analysis has opened up, the trainer who wants to be top rung needs to become familiar with the principles and the many practical bits of knowledge that behavior analysts have gathered along the way. Accumulated knowledge does not do any good unless someone uses it. And so we urge you to read carefully, question what you do not understand or you feel may not be clearly expressed, and get as much as you can out of these brief writings and the short time available.

In the following pages, you will find some suggestions for beginning training. The first behaviors you train should be fairly simple. For efficiency, they should also be what we call “generic” behaviors. By “generic” we mean behaviors that are common to, or the source of, other behaviors. These are behaviors like going to a target, pecking at a black spot, pulling on a ring with the beak. As we will see, these are all behaviors that you can use over and over again in building new behavior combinations.

There will also be some general rules and cautions. In order to train any animal, it is best at first to train only one behavior at a time. The first step is to describe very carefully and exactly the behavior you want to control. For the first behavior, we recommend following or approaching a target. This is simple, and it is “generic.” You will find it very useful.

In the process of training, it is often necessary to break down or ANALYZE a behavior sequence. Many behavior sequences can be seen as combinations of small bits of behavior. Picking up a ball, for example, for a human, involves reaching for the ball, placing the fingers around it, and lifting. When we say a dog is jumping a hurdle, we are talking about several bits of behavior: Looking at the hurdle, running toward it, lifting the body off the ground, clearing the hurdle, landing, and walking to the finish point. It helps a great deal in training if we are able to break a behavior sequence into parts or RESPONSES like this; as we will see, sometimes each part, or response, has to be treated differently during the training process, and in these cases each response must be trained separately.

You also need to analyze the antecedents of the behavior you wish to train, the stimuli that precede the response, and the whole stimulus context in which the behavior will occur. You also need to analyze the chicken's physiological condition – obvious questions such as, Does the bird appear healthy? Has she had water available? Is she at least moderately hungry?

Of course, you will need to analyze the consequences as well. What are you going to use as a reinforcer? Will you use a secondary or conditioned reinforcer? If so, which one? What else might happen to the chicken after you present the reinforcer?

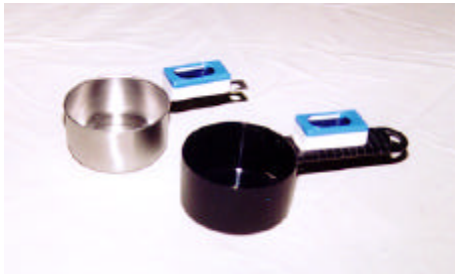
These are some of the steps we go through when we use behavior analysis. We will talk about the analysis of each behavior before you begin to train your chicken on each one. But there are some things you need to do first.

1) Plan Your Session. Before you start to train, you will need to have everything ready for the session: Your feeding device (a cup or shallow pan), your secondary reinforcing stimulus (your clicker, in this case), and your supply of reinforcers (grain, or other suitable type of chicken feed).

Decide on a location. A clear table top in a quiet location is best. It is best not to start out in an outdoor location, because of distractions, including fearful ones, like dogs or cats walking past, birds flying overhead. If your chicken is reasonably tame, you will not need to worry much about her flying off. You will not need to put a barrier or fence around the table.

2) Feeding Devices – Presenting the Primary Reinforcer. For simple, garden-variety training, your feeding device does not need to be elaborate. Electric feeders that make characteristic sounds (which can become the secondary reinforcers, like a click or a “thunk”) are nice, but not necessary. To start with, I recommend you keep it simple and cheap, unless you *want* to spend a lot of money or know a good “handyman.”

You can use a simple measuring cup (preferably with a longish handle, to make it easy to use) and put your clicker in one hand and the cup in the other. Or, to help you with your hand movements, you can use a small flat pan or large measuring cup (1/2 to 1 cup) with a clicker taped (or otherwise fastened) to the handle.



3) Your Chicken's Primary Reinforcer. For training chickens, particles of scratch grain, pelleted or crumbled feed, or even bird seed, make good reinforcers. If you do not know what the chicken has been fed in the past, you may have to experiment in order to find a feed, or a combination, that the bird likes and eats readily. Fortunately most types of feed that are suitable for the chicken are not messy or difficult to use. We do not recommend dry “mash” (fine crumbled, finely divided feed) because of the mess and slowness of the bird's consumption.

4) The Behavioral Goal. Decide on the behavior you are going to train – write down a simple description of what you want the FINAL behavior to look like. Also decide what initial responses you can accept as a start, on the way to that final behavior.

5) Other Equipment. Decide on what other equipment, “props” (this term comes from theatrical or stage properties, of course), or other devices you will need to train the behaviors -- for example, a target holder, the target itself, for target training. For the target itself, consider a small (2” x 2”), stiff cardboard with a black dot in the middle, about ¼ inch in diameter. A target holder might be a stick about two to three feet long, with a wooden pinch clothespin attached to the end. Grasp the card with the clothespin. This target item is now ready for initial training. Of course, as a simple substitute for the card holder, you may use a pencil, and teach the chicken to peck at the rubber eraser, or put a dot on the pencil itself. Later on, of course, the target card or dot can be fixed to other objects that you want the chicken to select, peck, or interact with in some way.

Another piece of equipment you will need for a second bit of generic training is a rubber or plastic ring or loop. Small diameter (1/8") tubing, small diameter electric wire coated with plastic, and other similar materials are all suitable. Tie a string through this loop with a fishline knot and you can then fasten this loop to almost anything you desire.

A third useful "prop" for simple initial training is a ping pong ball dangling on a string. We will describe later how all these simple devices can be used for creating trained behavior displays.

6) Controlling Your Chicken and the Training Environment. The chickens you are training may be new at this game. The environment will be a table top where all the action will take place. To make sure that the bird is not distracted and keeps its attention on its training, do not allow any loose scattered feed to clutter the table top or the floor around your table – the bird naturally will pay attention to anything that looks good to eat, but you want your chicken to keep its mind on its work.

The birds may not be accustomed to working in this location, and you are new at the game too. You may tend to be clumsy. The chicken may be skittish. Be careful about your movements. Do not make sudden movements as if to grab the chicken, or wave your arms about, or move in quickly toward the table. Try to handle the training equipment as smoothly as possible. Introducing the feed cup or a piece of equipment with a sudden thrust can startle the chicken. You may even frighten the bird so badly that it will jump off the table.

In spite of all precautions, a bird will sometimes fly off the table. If it does, do not chase it wildly. Stay calm and slow in your movements. Gently herd it into a corner, if possible, or up against a wall. Using careful hand movements, slowly pick it up, your hands over its wings in the preferred fashion, and return it to the table top. Give it a click and a bit of food right away. By the way, if you are training and someone else's chicken jumps off the table, do not turn your attention from your own bird and try to capture the fleeing fowl. One errant bird at a time is enough. If you wish to help capture the escapee, secure your own chicken first.

DO NOT leave your bird unattended on the table, even for a minute or so. It will almost certainly jump off. Put her in a holding cage until you have finished whatever took you away from the table.

Make sure your chicken has had water available recently so that it does not come to the training session thirsty. If your training session lasts more than 45 minutes, you should consider giving the chicken a drink, especially if there have been many reinforcements. Dry chicken feed absorbs moisture from the chicken's body.

7) Keeping Records. You should set up some sort of a system for keeping records on your chicken, so that you will know the next day exactly what you did the day before, and even more important, what the chicken did. You may use a large ruled record card, which you can keep on a clip board, with a pencil handy, or a spiral notebook, with an attached pencil. Pencils are probably better than pens for keeping animal records of this sort. They can be erased if you make a mistake, a common happening if you are writing a record in haste, as is often the case. Thus they would not be as messy as a scratched up pen record.

Data that should be entered daily:

- a. Time of day, at start and end of session
- b. What responses are worked on, progress on each.
- c. A count of the number of successes and the number of wrong responses during the session
- d. Notes about special conditions or happenings
- e. Approximate amount of feed earned in a training session
- f. Amount of extra feed given at the end of the training day.

You may also want to leave extra space for special types of training work.

NOW! If you have taken all the above steps, you are ready to begin.

III. CONDITIONING THE BRIDGING SIGNAL (THE CONDITIONED OR SECONDARY REINFORCER)

1) When You Begin: First, make sure your chicken is ready to eat in the training setting – out on the open tabletop, and from the cup or other device in which you are going to present the reinforcer. **STAND VERY QUIETLY, CLOSE TO THE CHICKEN.**

Now, still standing very quietly, move the feed cup into her line of sight. Then move the feed cup into the chicken's vicinity. Hold it still, with the feed clearly visible. (It is best to put only several pieces of feed in the cup at one time so it will not be scattered.) Wait quietly until the chicken starts to eat.



Allow the chicken to clean up the several grains you have placed in the cup. Then remove the cup, put in more grain, and after a few seconds try again.

If the bird does not eat the first time it sees the grain, you may gently jiggle the cup – sometimes moving stimuli tend to be noticed more. Or drop a few more grains into the cup so that the chicken can see the grain fall.

After the bird is eating regularly from the cup, you are ready to start conditioning the sound of the clicker with the presentation of the grain.

Do NOT try to introduce the bridging stimulus until the bird is eating REGULARLY from the cup.

TRY NOT TO MOVE YOUR HANDS UNTIL YOU ARE READY TO CLICK AND FEED.
SOUND THE CLICK FIRST – *THEN* PRESENT THE FEED PAN. Do not move the feed cup until you have completed your click.

Chickens are very quick to pick up hand movements, whether or not these are intentional or not. **DO NOT** let the chicken pick up on hand movements – you may be reinforcing something you do not wish to reinforce.

KEEP THE PAN OR CUP OF FEED OUT OF SIGHT UNTIL YOU ARE READY TO REINFORCE THE CHICKEN'S BEHAVIOR.

2) Bridging Signals. The **conditioned**, or **secondary reinforcer**, is also a **discriminative stimulus (S^D)**. Please see the previous section for the discussion of establishing discriminations, thereby creating S^D s. When these become well conditioned, they acquire some reinforcing properties of their own, just by being paired with the primary food reinforcer. The discriminative stimulus becomes a predictive cue for reinforcement – when the animal hears or sees the S^D , the primary reinforcer will follow. A human would say that the animal comes to “expect” the food. In the animal training world, even another name has been given to this useful device: the **bridging signal**, sometimes called the **bridging stimulus**, is a signal, usually a sound, which we give just as or just before we feed the animal. Occasionally the single word **bridge** is used.) This signal tells the bird that it has performed the response correctly and that it is about to get its reinforcement; hence the psychological term secondary reinforcer. We call it a “bridging signal” because it “bridges the gap” between the time the bird performs its response and the time it actually receives the reinforcement. It becomes very important later on when you are training behaviors where the bird has to walk (or fly) some distance to receive its primary reinforcer after it has made its response.

What can we use for a bridging signal? A Halloween “cricket,” a small metal toy which clicks when you push on the flat underside, makes a good device. We will be using this device in these training sessions, until we get to the sea lions and dolphins, where a whistle is used as a bridging device. However, in a

pinch, almost any sound which can be made quickly and in the same manner time after time, can be used. For example, a quick rap with a strong stick or a screwdriver on a wooden surface, a "ping" with a small desk bell, or any similar sound can be used.

Signals which the bird can see--such as a special hand movement, or a flashing light, can also be used but may have drawbacks. People tend to get careless about hand movements and may give the bird signals that are not intended. Hand signals, unless VERY carefully used, can easily confuse the bird. Also visual signals of any kind cannot be used where the bird may have its back turned, is behind a barrier or door, or for any other reason cannot see the signal. A sound can be used when the bird's head is turned or even when it is behind a wall, and so on. Whatever sound you use, you should be able to give it loudly enough so that the bird always hears it, but it should not be such a loud sound that it frightens the bird.

Many people have asked us about simply using words, especially with dogs, such as "Good boy!" or "Right." There are several problems here. However careful you may be about HOW you say the word, or however consistent you may think you are, still inconsistencies will creep in, and you will find yourself, especially under stress, giving these stimuli in strained, unnatural manners. Also, people tend to chatter, and if you begin to use words as S^Ds, you may find yourself saying lots of other things too, and the actual signal gets lost in all the verbal clutter. In any case, it is not possible to utter a word as clearly, as consistently, as quickly as the click of the clicker. It makes for a snappier performance all around. A clicker also gives a sound that is distinctly different from other sounds in the background (after all, the chicken – and your dog – is used to you chattering around her all the time) so that it will easily become salient, or stand out from the clutter.

You will need a container and a location for storing your extra feed – that is, feed that you draw on during the training situation, but which you do not want to put in the feed cup all at once. We recommend a plastic (preferably opaque, so the bird cannot see through it) storage canister, with a lid that is fairly easy to open and close, so that you will not be struggling with it while you are trying to get ready for the bird's response. A large coffee can will also do nicely. This spare supply of feed should be kept under the table, or some other convenient place near the training table where you can reach it readily but the bird cannot see it well enough to be distracted by it.

Once you have picked out your bridging signal, there are some very important rules about how to use it correctly.

3) Correct use of the bridging stimulus.

- a) The same bridge should be used each time for a particular bird.
- b) Try to give the bridging signal JUST AS the bird completes the correct response. However, do NOT make any motions toward presenting the primary reinforcer until the bridge has been FULLY presented. If you are using a clicker, do NOT click it part way, holding your thumb down on it, as you present the food.
- c) If there can be a single **most important factor** in the mechanics of training, it **is the timing of the secondary reinforcer**, or bridge. If you can anticipate what the bird is going to do, it is better to present the bridge JUST AS THE BIRD STARTS TO MAKE THE CORRECT RESPONSE. For example, you can probably tell that a chicken is about to peck at a spot by the way it stares intently at the spot, then puts its beak down close to the spot, and then the head thrusts forward – at this point, give the bridging signal. Just as the bird's beak strikes the spot, the click should occur. Allowing for the natural time interval between when you decide to click, and your fingers actually do the clicking, you will always be late **IF** you wait for the actual peck to take place. You must anticipate the peck by a time determined by your experience and reflexes. Those with faster reaction times can wait longer than those who are slower. You may make a few mistakes, where the bird will not *quite* finish the peck, but this is better than being too late with the bridge. Of course, if this were a manual on training South American tree sloths, we could say that the sloth is so slow that timing is no problem. However, since we *are* training chickens, and chickens are very fast, you may find timing your reinforcements a little more difficult than with some animals, including most

dogs. Note that this anticipation of a response does **NOT** mean that you should always reinforce behavior early. That would be an error, and almost surely would lead to unwanted behavior. The purpose of the anticipation is to allow for the natural and unavoidable time delay caused by the trainer's reaction time.

- d) The time between the sounding of the bridging signal and the reinforcement should be as short as possible; in early stages of training, avoid training responses where the bird must be some distance from the source of the reinforcer. Keep the bird close to you during these early stages, and gradually work her farther away from you if the final behavior requires it.
- e) NEVER sound the bridging signal idly (just to be "fiddling") or teasingly; NEVER sound it unless you plan to reinforce the bird with food, the primary reinforcer. Watch out for the tendency to click it just to be doing something. Do NOT click it to get the chicken's attention, or to call the bird over to you. It is important that the "meaning" of the bridging stimulus be kept unambiguous and clear. It should ALWAYS signify the same event – the primary reinforcer. For all these reasons, keep the clicker away from children.
- f) If the response you are working on requires the bird to keep on doing something, for example, pulling on a loop, be sure to give the bridging signal *while the bird is still pulling*. Do NOT wait until the bird has stopped. If you wait, you will be reinforcing stopping, not pulling. So the general rule is to sound the bridging signal while the bird is still performing the response you want.
- g) Make sure that there are LOTS of primary reinforcers associated with bridging stimuli early in training. The bridge should be sounded and paired with food so often, before you ever try to train another behavior, that the bird, no matter which way it is facing, will turn instantly and go to your cup to get its feed. This means that after the bird has begun to move quickly to get the food after you have sounded the clicker, you should begin to wait a few seconds, until the bird has moved away a bit, perhaps has its head turned, so that the bird can learn that whenever that click sounds, instantly returning to the cup will produce food.
- h) After you have allowed the chicken to eat up her reinforcer, quickly remove the feed cup, put it behind you or otherwise where the bird cannot see it.

You will probably need AT LEAST as many as 50 pairings of click and feed, when the bird is facing in different directions from the cup's location, before you will get the kind of response you need for sound training.

Once you are sure your bird is sufficiently "clicker-trained," or bridge-trained, you are ready to start actual "show" response training, in this first case, going to and pecking at the target.

NOTE 1: *If the bird seems to be afraid of the sound of the clicker, freezes, or starts to leave, try muffling the clicker by wrapping a handkerchief or other small cloth around your hand, or put the clicker somewhat behind you.*

NOTE 2: *Probably you would never think of doing this, but -- You should never attempt to punish a chicken physically. The only effect that a slap, say, would have would be to terrify the bird so that it might not ever get on the table top again. Also, pushing a chicken does not work. If you want the chicken to be someplace else, lure it with food or a target -- if it has been target-trained. Or gently pick up the bird and place it in the desired location.*

TIMING

This topic is so important that it warrants a special section. Actually, it will not take long to discuss the matter, but it is crucial for maximizing your skills as a trainer, for shortening training time, and producing a sharp, precise performance on the part of the animal. Countless laboratory studies have shown that a

reinforcer has its greatest effect if it follows the response by only a few seconds. After only a few seconds delay, the effect of the reinforcer declines in strength swiftly.

By timing, we mean first the timing of your presenting the bridging stimulus as (or *immediately after*) the chicken makes a response. “As” is really the better timing. If you can reinforce the response while it is still happening, the effect of the reinforcer is stronger. And this is indeed one of the great advantages of the clicker. It is a sharp, short duration, clear-cut stimulus that makes for prompt reinforcement. It is much faster and more precise than trying to present the food treat itself after a response.

What do we mean by sounding the clicker as the response is being made? We have mentioned that chickens are very quick in their reactions. What this means is that if you are not swift in *your* reaction, the chicken may already have gone on to do something else. When this happens, you will be reinforcing the “something else” instead of the response you wanted to reinforce. So it means that if you want to reinforce a chicken’s response to a loop, at the first, you may have to reinforce the chicken for looking at the loop, then for biting at it, finally for pulling. Do not wait to click until the chicken has dropped the loop. Finally, if you want to reinforce really vigorous loop pulling, sound the clicker when the bird is *still pulling on the loop*, not after she has let go. As you will see below in the pecking training, at first, click when the chicken is just looking at the dot, then for pecking the dot. However, when she has started really pecking at the dot, click just as she *starts to peck*. If the bird stops short of the dot, as she sometimes may, you may be reinforcing a few weak starts, but this is better than missing the peck altogether. Later, you can get rid of the mere “looks,” by extinction.

The point is that if you are responding to the animal’s success at responding in the form of your final criterion response, if you wait until the animal is finished with this response, you are too late. **You must anticipate.** By the time the animal has completed the chain of events that lead up to the bridging stimulus – all the little sub-responses that make up a complete response – the bridge should already have arrived at the animal’s ear.

This philosophy is true for training any animal, but it is the most significant for the simpler animals, like chickens. The animals that are better at generalizing, the “higher” animals, like dolphins, apes, probably dogs and cats, raccoons and bears, can interpolate and extrapolate. They can bridge the gap themselves better than the simpler animals can – they can fill in the blanks and go on beyond to predict, by whatever mediating processes they may have. We do not yet know what these might be.

NOTE 3: Do not try to train ANY of the responses until you are sure that the chicken is thoroughly clicker-trained.

IV. FIRST LESSONS

LESSON 1. TARGET TRAINING

A. Analyze “Responding to a target.” The response for the bird will be to peck at the black dot on the target. A visual stimulus like this black dot on a white background will stand out so that the bird can easily see it. The chicken will learn to peck this dot. When that response becomes strong, you can start to move the pencil with the black dot around on the table top. The bird will then learn to follow the dot around so that it can earn its click and treat.



B. Equipment. The easiest target to prepare is a piece of dowel, or other small diameter round stick -- a pencil will do. It should be several inches long, so that you can easily handle it and move it in close to the chicken. At one end of the target stick, you will need to make a black dot about ¼” in diameter. It does not need to be any larger for this situation. An easy way to do this is to take a piece of white tape and fasten it around the pencil. Use a marker to make a clear dot on this tape.

C. How to train the pecking response. Here are the steps in the behavior of pecking at the target:

(1) Some birds will automatically tend to go toward and peck at objects like this black dot, but most of the time you may have to shape the bird's behavior, or "lure" the chicken toward it. One of the easy lures is to place some feed on the sticky side of a piece of clear Scotch tape. Tape this "bait" over the dot, so that the bird can see the grain. The bird often will go immediately to the tape and try to peck off the food. If this happens, immediately sound the clicker and feed the bird. Now it is just a matter of reducing the amount of grain on the tape, until the bird is pecking the spot with no grain at all.

(2) If the bird does not go quickly to the taped-on grain, add a bit more grain. Then be patient. One trick to speed things up a bit, if the bird seems disinterested or unobservant, is to put a few grains of feed on the table top. Put the pencil down in the midst of this little stack of grain with the taped dot uppermost. Usually the chicken will go to the grain, start pecking around at the loose feed, and, when that is all gone, peck the grain on the tape. Then take up the procedure as in (3) below.

(3) After a few more reinforcers for pecking at the tape, take off the tape entirely. Try getting the response to the dot alone. Usually the chicken will do this readily. Quickly reinforce the first response that is made to the dot alone, even if it is not a complete peck. Then begin to reinforce only the full pecks at the dot, allowing the other responses to extinguish. Extinguish any responses that do not hit the dot, that seem to be "raking" at the dot, or otherwise do not meet the criterion desired.

Resist the temptation to wiggle your finger near the end of the target or tap at the end of the stick. These are cues that may attract the chicken, but they may simply confuse the issue. In any case they are extra cues that you will later have to fade out of the picture.

(4) Once you have a strong, straight peck at the dot, the next step is simply to build up the strength of this response by repeated reinforcement, keeping the target stick in the same approximate location. If the response.

(5) Remember to keep moving the feed cup out of sight after every click-feed pairing.

(6) Sometimes it is faster to use pure shaping techniques in training this response. Of course, if the chicken shows an immediate tendency to go towards the black dot, you are almost there. Allow the bird to get close to the dot.

Before the bird can peck at the black dot, of course, it must first *look at the black dot*. Watch carefully – as soon as the bird looks hard at the dot, reinforce the looking response.

Analysis reveals that the next step after looking is usually pecking, but sometimes the bird may not make a complete peck. This incomplete peck is still a response on the way to pecking.

(7) The next time, the chicken will probably be quicker to look at the dot. Again, quickly click and feed. You can do this two or three more times, but do not overdo this "almost peck" – too much time spent on just looking will detract from getting the real response you want.

(8) The next step is the full fledged peck at the dot. Watch closely here, because we do not want a rake with the beak at the dot, but a nice, clean, head-on peck. You will recall that in the first section we noted the importance of not being late with the click. If you reinforce the pecking response just as it begins, you may sometimes inadvertently reinforce a few "almost" responses, but with time and extinction these will drop out as the reinforcement for the actual peck takes over and the response becomes very strong.

(9) Once you are getting good strong pecks at the dot on the target, and have reinforced such a response at least 50 times, you can begin gradually to move the target around. Start by moving it only a few inches, keeping it still close to you and the clicker/feed cup. Gradually extend the distance to points farther away, until the bird is going to it at the far ends of the table. Also, begin to evoke the response in two different ways: first, have the bird following the moving target, keeping it just out of her reach until you have reached the desired point. Second, move the target when the bird is not looking, hold it still, and have the bird find the target, somewhere on the table top. Both these types of training should go on until the chicken will go with either method to any point on the table.

LESSON 2. TRAINING THE LOOP PULLING RESPONSE.

A. Analyze loop pulling. The desired final response here is for the bird to grasp the loop firmly in its beak, and pull back strongly, with a good long tug. The goal is to see how far back your chicken can pull on the loop/rubber band attachment when it is fixed to a firm anchoring point. You will be measuring this distance. Early and intermediate steps may include (1) looking at the loop, (2) raking at the loop with the beak, (3) grasping the loop in the beak, (4) tugging on the loop, (5) setting back on the loop and really pulling hard.

B. Equipment for this lesson includes, of course, the clicker and the feed cup, and a piece of plastic or rubber, small diameter tubing that can be shaped into a loop. The loop should be about 1 1/4 to 1 1/2 inches in diameter, attached to a piece of nylon fishline about 2 feet long. Also, there should be a strong but flexible rubber band (2 to 3") between the fishline and the loop. Once the chicken begins pulling on the loop, you will see the reason for this rubber band.

C. Steps in training loop pulling. (1) Lay the loop on the table in front of you, near where you will be clicking and feeding the chicken. As in the case of the response to the dot, some chickens will go immediately to the loop and peck at it. (Perhaps to the chicken, the loop resembles a worm.) If the bird does this, quickly click and feed. If the bird merely looks closely at the loop, click and feed. After a few such looks, wait for beak contact.

If the bird does not respond promptly to the loop as is, you might try wiggling it gently, by bouncing it a bit on the fishline. If this gets the bird's attention, again click and feed.

(2) The first beak contact may be just a peck at the loop, or a rake across it. Reinforce either one. However, after a few such reinforcers for just pecking or raking, hold the bird to a firm grasp. Sometimes after just a few reinforcers, the next response will be that the bird will really grab the loop firmly and tug. This is the response you are really looking for. Keep reinforcing these good tugs. Try to extinguish the responses that rake at the loop or simply "flip" the loop around.

(3) Once you start getting good tugs on the loop, your goal now is to shape the longer and longer tugs. So keep reinforcing these good long tugs and extinguish those that are weaker or do not meet your standard of the moment – a standard which will change, of course, as the bird gets better at this task.

At this point you may want to lay a ruler down close to your rubber band so that you can measure the length of the pull. This is the best way to keep your reinforcement exact. REMEMBER PRECISION!

LESSON 3. TRAINING THE PING-PONG BALL RESPONSE.

NOTE 4: Do not try to train this response until you have the chicken pecking reliably at the black dot on the target stick.

A. Analyzing the ping-pong ball strike. The final response desired here is a strong, straight peck on the ping-pong ball so that it will swing vigorously.

B. Equipment. The equipment for this behavior requires a ping-pong ball attached to a piece of fishline about 8 inches long. Put a black dot about on the equator of the ping-pong ball.

The ball needs to be firmly attached so that it will not easily pull off in case the chicken grabs at it. At first the trainer or the trainer's assistant may hold the string and suspend the ball at a convenient height for the chicken. Soon, however, the ball will be attached to a gallows-like holding stand for the final stages of training. You will also need a yardstick to set up behind this holding stand so that you can measure the height which the ball reaches.

You may also need your target stick with its black dot in case the bird does not go immediately to the dot on the ping-pong ball.

C. Steps in training the ping-pong ball strike. (1) The trainer's assistant at first will dangle the ball in front of the chicken, close up and at the usual height of the chicken's beak when she is standing upright. The assistant should try to place the dot on the ball where the chicken can see it. Very often the bird will go immediately to the dot.

Give the bird a considerable chance to approach the ping-pong ball. After all, even if she has seen a black dot before, and learned to peck it, this is a drastically changed stimulus situation. She has probably never seen a ping-pong ball before and may even be frightened of it. And remember, chickens are NOT great generalizers.

(2) The initial step is to have the bird peck at the ping-pong ball. If the chicken does not go fairly quickly to the dot, then bring in your target stick. Reinforce the first response or two just to the target stick. Then begin to move the target in toward the ping-pong ball, gradually, reinforcing responses to the target dot as you get it closer to the ball.

Then hold it right up next to the ping-pong ball. After one peck on the target dot at this point, remove the target while the bird is busy eating and not looking. Then wait for the bird to peck the dot on the ball. You may need to repeat this procedure, perhaps starting closer to the ball this time, until the bird will transfer its response to the ball by itself.

(3) After the initial pecking response to the dot has been reinforced, give large numbers of clicks and treats (at least 50) until the response is strong and reliable.

(3) Then harder and harder responses should be shaped, responses with a vigorous stroke of the beak.

(4) At the same time, shape responses for *direct* strikes on the ball, so that the ball will swing high. Avoid reinforcing sideways, glancing strikes, or downward strikes. Do NOT reinforce the bird's grabbing at the string, or at the spot where the string attaches to the ball.

(5) Continue shaping for stronger straighter strikes at the ball until the ball is swinging as high as it can, or as high as your criterion has been set.

LESSON IV. TRAINING A VISUAL DISCRIMINATION.

A. Analyzing the discrimination responses. For this particular discrimination, the chicken will be required to select (by pecking at it) one of three different shapes (of the same color and of approximately the same size) each printed on a white card or other plain background. For example, the task might be to select the square from a circle, triangle, or square. When training is completed, the bird should be able to peck at the square *at least* 95% of the time.

B. Equipment. The equipment for this task is very simple. You will need three plain cards on which the shapes can be drawn, or three shapes cut out of black or other bright colored paper (chickens do have good color vision, very much like ours). Each shape should be approximately 1" in each dimension (2", for cut-outs) with the circle of about 1" in diameter (2" for cut-outs). All should be approximately the same; that is, if you have a 1-1/2 inch circle, the square and the triangle should be 1-1/2 inches in width and height. Of course, you will need your usual clicking-feeding device and chicken feed.

C. Steps in training the visual shape discrimination. (1) We have arbitrarily elected to designate the square figure as the "hot" choice. That is, the square is the shape that the chicken should discriminate from the other two, the circle and the triangle. Thus the first task is to shape the chicken's response to the black square.

(2) Because your chicken has already learned to peck at a black dot, the response of pecking at a black square, somewhat larger than the accustomed dot, should train swiftly. Lay the card with the square (or

the black square itself, if you are using cut-out shapes) on the table in front of the chicken. DO NOT introduce the other shapes at this time.

Sometimes a chicken will go right to the black square and peck it. If so, click immediately and feed, even if the response is weak or incomplete, for this first time. However, as we have warned, chickens do not generalize very well. If the square is in another world away from the black dot, as far as the chicken is concerned, you may have to bolster the stimulus with a tiny bit of feed on the square.

Now the chicken should go right to the feed and peck. Click and feed. Again, gradually remove the feed, a bit at a time, until the bird is pecking the black square alone.

Reinforce pecking the square at least 30 times before you introduce another shape. Avoid reinforcing responses that you DO NOT WANT, such as a rake, scratching at the card or shape, or hitting the card at any place on the card except the square itself. In other words, if the bird hits on the corner of the card, or anywhere on the surface except the square, do not reinforce such a response.

(3) After the response of pecking at the square is good and strong, you may introduce a second shape. The next one recommended is the one that is most different from the square, namely, the circle. One of the laboratory findings, not surprisingly, is that the greater difference there is between stimuli, the more quickly an animal will be able to form a discrimination. This is true in all the sensory departments, or **modalities**, whether it is vision, audition, smell, taste, or touch.

The chicken may go right to the black circle and peck – after all, this circle is more like the black dot than is the square, so this response is already somewhat stronger (by generalization) than the initial response to the square had been. DO NOT REINFORCE pecks at the circle, of course. Wait until the bird goes back to pecking the square. When she does, click and feed quickly.

Here what seems like a chicken's limitation plays in your favor, namely, the poor generalization capability. Chickens are good at forming discriminations, especially fine visual ones.

(4) Give numerous trials with only the square and the circle on the table. Change their respective positions, left to right, at random. In this way the bird will not be accustomed to simply hitting the one on the right or the one on the left.

If the chicken seems to be making lots of errors, there are some steps you can take to increase accuracy. First, make sure that she is not too hungry. If she seems rather wild in her choices and eats as if she has not eaten in a week, she may not be able to concentrate on squares or circles. In such a case, give her a small amount of feed (1 or 2 tablespoons), enough to take the edge off her hunger. Let her finish eating this, then try her again after a few minutes.

Second, if she keeps on with errors, you can use the deliberate extinction technique. To set this up, remove the "hot" object, the square, set the circle in front of the chicken and let her hammer away at it. She will probably peck the circle for a considerable number of responses. Finally, she will begin to slow down and stop. The responses to the circle will not be entirely extinguished, but if she ignores the "cold" object for several seconds and seems to be looking around, reinstate the square. Probably she will peck it right away. Be prepared to click and feed *immediately*, then proceed with square/circle trials as before. If she again starts hitting the circle, again remove the square, and go on as previously. Finally, the response to the circle will die out, and you will be getting a very good discriminated response to the square.

(5) When the bird is hitting the square about 80-90% of the time, accurately enough so that you can be sure it is not a chance response, you can introduce the triangle, along with the circle. Again, reinforce only responses to the square. The bird may occasionally peck the triangle, especially when it first appears. Be sure not to reinforce these wrong responses! (The trainer needs to make the discriminations too!) Do not forget to keep changing the relative responses to the three objects. Again, if the chicken starts to make sloppy mistakes, remove the "hot" square and let the bird peck away at the other two objects. When responses to these seem to have died out (extinguished), put the square back

in. Repeat this treatment until the discrimination appears to be firm, and the chicken is hitting the square with 90-95% accuracy.

Remember that at the beginning of the next training trial, whether it is several hours later, or the next day, there will be some spontaneous recovery of the previously extinguished responses. This is normal – just keep on with trials and allow the discrimination to settle down again.

With some chickens it is possible to get a reliable 3-way discrimination like this in a single training trial. A firm discrimination between two objects can usually appear by the second training trial. It will probably take more trials, really to master the task, and indeed, many trials will be needed before the discrimination is really reliable, so that it holds its high accuracy record.